

Konstrukcije usmjerenih regularnih grafova iz grupa

Zubović, Matea

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Sveučilište u Zagrebu

PRIRODOSLOVNO–MATEMATIČKI FAKULTET
MATEMATIČKI ODSJEK

Matea Zubović

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grafova iz grupa**

DOKTORSKI RAD

Zagreb, 2023.



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Mentor:

Izv. prof. dr. sc. Vedrana Mikulić Crnković

Zagreb, 2023.



University of Zagreb

FACULTY OF SCIENCE
DEPARTMENT OF MATHEMATICS

Matea Zubović

**Constructions of directed regular
graphs from groups**

DOCTORAL DISSERTATION

Supervisor:

Assoc. Prof. Vedrana Mikulić Crnković

Zagreb, 2023.

IZJAVA O IZVORNOSTI RADA

Ja, Matea Zubović, studentica Prirodoslovno-matematičkog fakulteta u Zagrebu, s prebivalištem na adresi **Krasića 173, 51224 Krasiće**, ovim putem izjavljujem pod materijalnom i kaznenom odgovornošću, da je moj doktorski rad pod naslovom: Konstrukcije usmjerenih regularnih grafova iz grupa, isključivo moje autorsko djelo, koje je u potpunosti samostalno napisano uz naznaku izvora drugih autora i dokumenata korištenih u radu.

U Zagrebu, rujan 2023.

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SAŽETAK

Predmet istraživanja doktorske disertacije su usmjereni regularni grafovi konstruirani iz tranzitivnih permutacijskih grupa.

U prvom dijelu disertacije uvest će se osnovni pojmovi i tvrdnje iz teorije grupa, teorije dizajna, teorije grafova i teorije kodiranja. U drugom dijelu disertacije analizirat će se svojstva usmjerenih kvazi-jako regularnih grafova, kao i uvesti i dokazati metode konstrukcije istih iz matrica susjedstva poznatih usmjerenih kvazi-jako regularnih grafova. Također, opisat će se postojeća metoda konstrukcije 1-dizajna iz tranzitivnih permutacijskih grupa te će se postojeća metoda modificirati u svrhu konstruiranja usmjerenih regularnih grafova. Također, prikazat će se analiza mogućnosti upotrebe konstrukcije s ciljem konstruiranja usmjerenih regularnih grafova uz pretpostavljeno netranzitivno djelovanje konačne grupe.

U trećem poglavlju opisat će se algoritam modificirane metode konstrukcije usmjerenih regularnih grafova koristeći orbite stabilizatora za djelovanje tranzitivne permutacijske grupe na konačan skup. Navedeno će se potkrijepiti konkretnim primjerima, kao i potpunim ili djelomičnim klasifikacijama (usmjerenih) jako regularnih i kvazi-jako regularnih grafova.

U zadnjem poglavlju iz matrica susjedstva usmjerenih jako regularnih grafova konstruirat će se samoortogonalni i LCD kodovi te analizirati njihova svojstva. Za sve navedene konstrukcije koristit će se programski paket GAP ([32]) i njegovi paketi DIGRAPHS ([24]) i GUAVA ([28]) te programski paket MAGMA ([6]).

SUMMARY

The subject of research of the dissertation is directed regular graphs constructed from transitive permutation groups.

In the first part of the dissertation, the notions and facts of group theory, design theory, graph theory, and coding theory are introduced. In the second part of the thesis the properties of directed quasi-strongly regular graphs are analyzed and the methods for their construction from the adjacency matrices of known directed quasi-strongly regular graphs are introduced and proved. Moreover, the existing method for constructing 1-designs from transitive permutation groups is described and modified for the purpose of constructing directed regular graphs. Also, an analysis of the possibility of using the construction with the aim of constructing directed regular graphs with the assumed non transitive action of the finite group is presented.

In the third chapter, the algorithm of the modified method for constructing directed regular graphs using stabilizer orbits for the action of the transitive permutation group on the finite set is described. The above is supported by concrete examples and complete or partial classifications of (directed) strongly regular and quasi-strongly regular graphs.

In the last chapter, self-orthogonal and LCD codes are constructed from adjacency matrices of directed strongly regular graphs and their properties are analyzed. The program package GAP ([32]) and its packages DIGRAPHS ([24]) and GUAVA ([28]) as well as the program package MAGMA ([6]) are used for all the above constructions.

KLJUČNE RIJEČI

1-dizajn, usmjereni jako regularan graf, usmjereni kvazi-jako regularan graf, tranzitivna permutacijska grupa, samoortogonalni kod, LCD kod

KEYWORDS

1-design, directed strongly regular graph, directed quasi-strongly regular graph, transitive permutation group, selforthogonal code, LCD code

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UVOD

Teorija grafova je grana matematike koja se bavi matematičkim objektima koje nazivamo grafovi, a koji se koriste kako bi se predstavile relacije koje uključuju dva elementa određene kolekcije. Teorija grafova ima široke primjene u različitim disciplinama. U teoriji grafova razmatramo strukture pomoću kojih možemo modelirati mnogo problema iz svakodnevnog života. Začetak teorije grafova veže se uz švicarskog matematičara Leonarda Eulera koji je 1736. godine postavio i riješio tzv. problem *Sedam konigsberških mostova*. Objavio je 1741. godine članak *Solutio problematis ad geometriam situs pertinentis* ([27]) u časopisu *Commentarii academiae scientiarum Petropolitanae*, u kojem je formulirao i riješio navedeni problem. Ovaj rad danas se smatra prvim radom u matematičkoj disciplini - teoriji grafova.

Jako regularne grafove prvi je definirao Raj Chandra Bose 1963. godine u radu [5]. Jako regularni grafovi čine važno područje istraživanja u teoriji grafova. A. Brouwer i H. van Maldeghem u [8] koriste alternativnu, ali potpuno ekvivalentnu definiciju jako regularnog grafa na temelju spektralne teorije grafova. A. Brouwer održava javnu bazu podataka [9] o rezultatima postojanja jako regularnih grafova s određenim parametrima na $n \leq 1300$ vrhova. Jako regularni grafovi konstruirani su iz različitih struktura, na primjer iz dizajna ([13]). Također, određeni jako regularni grafovi konstruirani su i iz permutacijskih grupa. Primjeri takvih konstrukcija dani su u [22] i [20].

U radu je cilj konstruirati usmjerene regularne grafove. Usmjerene jako regularne grafove kao usmjerenu verziju jako regularnih grafova definirao je prvi 1988. godine A. Duval u radu [26]. U navedenom radu opisani su nužni uvjeti na parametre usmjerenih jako regularnih grafova i navedene različite metode konstrukcije tih grafova. S. Hobart i A. E. Brouwer održavaju javnu bazu podataka [10] o parametrima, konstrukcijama i nepostojanju usmjerenih jako regularnih grafova ([38]). U brojnim su radovima opisane konstrukcije usmjerenih jako regularnih grafova, poput na primjer konstrukcije iz konačnih incidencijskih struktura [47] ili blok matrica [1]. Također, konstruirane su neke beskonačne familije usmjerenih jako regularnih grafova, kao na primjer u članku [34]. Novi radovi, poput na primjer [48], koriste semidirektni produkt i semidiedralne grupe za konstrukciju spomenutih usmjerenih grafova. Bez obzira na brojne konstrukcije, kao i dokaze o nepostojanju usmjerenih jako regularnih grafova s određenim parametrima (npr. [38]), postoje skupovi parametara za koje još nisu konstruirani usmjereni jako regularni grafovi. Najmanji parametri za koje još nije utvrđeno postojanje usmjerenog jako

regularnog grafa su $(22, 9, 3, 4, 6)$ i $(22, 12, 6, 7, 9)$. Jedan od ciljeva rada je pokušati konstruirati usmjereni graf s navedenim parametrima.

U radu proučavamo još jednu vrstu usmjerenih grafova, usmjerene kvazi-jako regularne grafove. Usmjerene kvazi-jako regularne grafove, kao generalizaciju usmjerenih jako regularnih grafova i kvazi-jako regularnih grafova ([31]), definirali su Z. Guo, D. Jia i G. Zhang 2022. godine u članku [33]. U članku [33] proučavani su usmjereni kvazi-jako regularni grafovi stupnja dva i dobivena neka ograničenja na parametre. Također, opisane su neke konstrukcije usmjerenih kvazi-jako regularnih grafova iz različitih kombinatornih objekata.

Od velike važnosti za rad su konstrukcije incidencijskih struktura iz grupa. U [40] i [41] su opisane konstrukcije simetričnih 1-dizajna, kodova i grafova iz grupa, dok su u [8] opisane konstrukcije nesimetričnih 1-dizajna iz grupa. Također, u [20] opisane su konstrukcije primitivnih 2-dizajna i jako regularnih grafova iz grupa.

Cilj je prilagoditi poznate metode konstrukcije incidencijskih struktura za konstrukciju usmjerenih regularnih grafova i opisati algoritam konstrukcije usmjerenih regularnih grafova koristeći orbite stabilizatora za djelovanje tranzitivne permutacijske grupe na konačan skup. Također, cilj je napraviti djelomičnu ili potpunu klasifikaciju usmjerenih regularnih grafova s određenim svojstvima te proučiti svojstva i konstruirati usmjerene kvazi-jako regularne grafove iz matrica susjedstva postojećih grafova sa istim svojstvima. U poglavlju 2 modificirana je metoda konstrukcije 1-dizajna navedena u [20] u svrhu konstruiranja usmjerenih regularnih grafova te su dane konstrukcije usmjerenih kvazi-jako regularnih grafova. U poglavlju 3 opisan je algoritam konstrukcije usmjerenih regularnih grafova iz grupa te su metode konstrukcije navedene u poglavlju 2 potkrijepljene konkretnim primjerima i djelomičnim klasifikacijama usmjerenih regularnih grafova. U zadnjem poglavlju opisane su neke konstrukcije samoortogonalnih i LCD kodova iz matrica susjedstva usmjerenih jako regularnih grafova i navedeni su primjeri dobivenih kodova te opisana neka njihova svojstva.

1. OSNOVNI POJMOVI

Za razumijevanje rada pretpostavlja se da je čitatelj upoznat s osnovnim pojmovima iz linearne algebre. U ovom poglavlju uvest ćemo osnovne pojmove teorije grupa, teorije dizajna, teorije grafova i teorije kodiranja potrebne za razumijevanje disertacije. Za detaljnije čitanje o navedenim temama upućujemo čitatelja na [7, 12, 25, 36, 37].

1.1. OSNOVNI POJMOVI TEORIJE GRUPA

Grupa je osnovna algebarska struktura. U ovom poglavlju opisujemo neke elementarne rezultate iz teorije grupa. Pretpostavljamo da je čitatelj upoznat s definicijom grupe te osnovnim pojmovima teorije grupa, kao što su na primjer: red grupe G (oznaka $|G|$), podgrupa H grupe G (oznaka $H \leq G$), kvocijentni skup (oznaka G/H), indeks podgrupe u grupi (oznaka $[G : H]$), puna grupa automorfizama (oznaka $\text{Aut}(G)$). Također, pretpostavljamo i da su poznate definicije i osnovna svojstva cikličke grupe reda n (oznaka \mathbb{Z}_n), simetrične grupe (oznaka S_n), alternirajuće grupe (oznaka A_n), diedralne grupe reda $2n$ (oznaka D_n). Za dokaze tvrdnji u ovom poglavlju čitatelja upućujemo na [12, 25].

1.1.1. Djelovanje grupe na skup

Definicija 1.1.1. Grupa G **djeluje** na skup Ω ako postoji preslikavanje $f : G \times \Omega \rightarrow \Omega$ takvo da vrijedi

1. $f(e, x) = x, \forall x \in \Omega,$
2. $f(g_1, f(g_2, x)) = f(g_1 g_2, x), \forall x \in \Omega, \forall g_1, g_2 \in G.$

Sliku djelovanja elementa $g \in G$ na element $x \in \Omega$ označavat ćemo sa $g.x$.

Definicija 1.1.2. Skup $G_x = \{g \in G \mid g.x = x\}$ naziva se **stabilizator** elementa x za djelovanje grupe G .

Stabilizator G_x je podgrupa grupe G .

Napomena 1.1.1. Ako grupa G djeluje na skup Ω , onda i svaka podgrupa grupe G djeluje na skup Ω . Posebno, i stabilizator G_x elementa $x \in \Omega$ djeluje na skup Ω i vrijedi $(G_x)_y = (G_y)_x$ za svaki element $y \in \Omega$.

Na skupu Ω na koji djeluje grupa G definiramo relaciju

$$x \sim y \Leftrightarrow (\exists g \in G) \text{ takav da je } g.x = y.$$

Propozicija 1.1.1. Relacija \sim je relacija ekvivalencije na skupu Ω .

Klasa ekvivalencije elementa x s obzirom na relaciju \sim ,

$$G.x = \{g.x | g \in G\},$$

naziva se **orbita** elementa x za djelovanje grupe G .

Preslikavanje $f : G/G_x \rightarrow G.x$, $f(gG_x) = g.x$, je dobro definirana bijekcija, pa vrijedi sljedeća propozicija.

Propozicija 1.1.2. Ako grupa G djeluje na skup Ω , onda je $|G.x| = |G/G_x| = [G : G_x]$, $\forall x \in \Omega$.
Ako je G konačna grupa, onda je $|G.x| = \frac{|G|}{|G_x|}$.

Definicija 1.1.3. Grupa G djeluje **tranzitivno** na skup Ω ako

$$(\forall x, y \in \Omega) (\exists g \in G) \text{ takav da je } g.x = y,$$

to jest, ako postoji element $x \in \Omega$ takav da je $G.x = \Omega$.

Dakle, za tranzitivno djelovanje postoji samo jedna klasa ekvivalencije, odnosno jedna orbita za djelovanje grupe G na skup Ω .

Primjer 1.1.1. Promotrimo djelovanje grupe G množenjem s lijeva na lijevi kvocijenti skup G/H za neku podgrupu H grupe G , odnosno

$$(\forall g \in G) \text{ i } (\forall g'H \in G/H) \text{ vrijedi } g.(g'H) = (gg')H.$$

Grupa G djeluje tranzitivno na G/H , odnosno vrijedi:

$$(\forall g'H \in G/H) \text{ vrijedi } G.g'H = G/H,$$

gdje je $G.g'H$ orbita elementa $g'H \in G/H$ za djelovanje grupe G .

Zaista, neka su $aH, bH \in G/H$ takvi da je $aH \neq bH$. G je grupa pa

$$(\exists x \in G) \text{ takav da je } x.a = b$$

te je $x.aH = (xa)H = bH$ iz čega slijedi $bH \in G.aH$.

Neka je G grupa i H podgrupa od G . Lijevu klasu grupe G po podgrupi H predstavljenu elementom a ,

$$aH = \{ah | h \in H\},$$

zovemo **lijevim suskupom** grupe G po podgrupi H , a desnu klasu grupe G po podgrupi H ,

$$Ha = \{ha | h \in H\},$$

zovemo **desnim suskupom** grupe G po podgrupi H . Element a zovemo predstavnikom lijevog suskupa Ha , odnosno desnog suskupa Ha .

Neka je G grupa i neka je H podgrupa od G . $T \subseteq G$ je **lijeva (desna) transversala** ili **skup predstavnika svih lijevih (desnih) suskupova** podgrupe H u G ako T sadrži točno jedan element svakog lijevog (desnog) suskupa aH (Ha), $a \in G$. Broj elemenata u T je $|G/H|$.

Neka grupa G djeluje tranzitivno na skup Ω i neka je $\alpha \in \Omega$. Neka je G_α stabilizator elementa $\alpha \in \Omega$ za djelovanje grupe G . Tada elementi $g_1, \dots, g_t \in G$ čine lijevu transversalu od G_α u G ako i samo ako je $\Omega = \{g_1.\alpha, \dots, g_t.\alpha\}$ i $|\Omega| = t$.

Teorem 1.1.1. Neka grupa G djeluje na skup Ω . Tada je $F : G \rightarrow S(\Omega)$, preslikavanje koje svakom elementu $g \in G$ pridružuje bijekciju $f_g : \Omega \rightarrow \Omega$, $f_g(x) = g.x$, homomorfizam grupa (homomorfizam induciran djelovanjem grupe G na skup Ω). Obrnuto, ako postoji homomorfizam $F : G \rightarrow S(\Omega)$, onda grupa G djeluje na skup Ω .

Definicija 1.1.4. Homomorfizam $F : G \rightarrow S(\Omega)$ naziva se **permutacijska reprezentacija** grupe G .

Definicija 1.1.5. Grupa G djeluje **poluregularno** na skup Ω ako su stabilizatori svih elemenata trivijalne grupe. Grupa G djeluje **regularno** na skup Ω ako G djeluje na Ω tranzitivno i poluregularno.

Primjer 1.1.2. Desna regularna permutacijska reprezentacija grupe G je inducirana regularnim djelovanjem grupe G na skup Ω , koji je u tom slučaju ekvipotentan kvocijentnom skupu G/I , odnosno grupi G . U tom slučaju grupa G djeluje regularno na samu sebe množenjem slijeva:

$$g.x = gx, g, x \in G.$$

Analogno, lijevu regularnu permutacijsku reprezentaciju grupe G dobivamo iz regularnog djelovanja množenjem zdesna:

$$g.x = xg^{-1}, x, g \in G.$$

Korolar 1.1.1 (Cayleyev teorem). Grupa G je izomorfna podgrupi grupe $S(G)$. Posebno, ako je G konačna grupa reda n , onda je G izomorfna podgrupi simetrične grupe S_n , odnosno G je permutacijska grupa.

Definicija 1.1.6. Grupa G djeluje **vjerno** na skup Ω , odnosno $F : G \rightarrow S(\Omega)$ je vjerna permutacijska reprezentacija, ako je F monomorfizam.

Vjerna permutacijska reprezentacija grupe nije jedinstvena.

Definicija 1.1.7. Neka grupa G_1 djeluje vjerno na skup Ω_1 i grupa G_2 djeluje vjerno na skup Ω_2 . Grupe G_1 i G_2 su **permutacijski izomorfne** ako postoji izomorfizam grupa $\phi : G_1 \rightarrow G_2$ i bijekcija skupova $\psi : \Omega_1 \rightarrow \Omega_2$ takvi da za svaki $g \in G_1$ sljedeći dijagram komutira

$$\begin{array}{ccc} \Omega_1 & \xrightarrow{\psi} & \Omega_2 \\ \downarrow f_g & & \downarrow f_{\phi(g)} \\ \Omega_1 & \xrightarrow{\psi} & \Omega_2 \end{array}$$

gdje je $f_g(x) = g.x$.

Ako su grupe G_1 i G_2 permutacijski izomorfne, onda su one i izomorfne. Obrat ne vrijedi općenito.

Primjer 1.1.3. Neka je $\Omega = \{1, 2, 3, 4, 5, 6\}$ i neka su dane grupe $G_1 = \langle (1, 2, 3, 4, 5, 6) \rangle$ i $G_2 = \langle (1, 2, 3)(4, 5) \rangle$. Grupe G_1 i G_2 su generirane elementima reda šest pa su izomorfne cikličkoj grupi \mathbb{Z}_6 i postoji izomorfizam $\phi : G_1 \rightarrow G_2$. Nadalje, u grupi G_1 ne postoji niti jedna netrivialna permutacija koja fiksira element 6, odnosno $G_1.6 = \Omega$ pa je djelovanje grupe G_1 na skup Ω tranzitivno. S druge strane, sve permutacije u grupi G_2 fiksiraju element 6, odnosno $G_2.6 = \{6\}$. Pretpostavimo da je $f_g(\psi(6)) = \psi(f_{\phi(g)}(6))$, $\forall g \in G_1$. Slijedi da je $\psi(6) = f_g(\psi(6))$, $\forall g \in G_1$, što je u suprotnosti s činjenicom da je djelovanje grupe G_1 na skup Ω tranzitivno. Dakle, grupe G_1 i G_2 nisu permutacijski izomorfne.

Ako je u definiciji 1.1.7 $G_1 = G_2$, za opisana djelovanja kažemo da su **ekvivalentna** (za $\phi = \text{id}$).

Propozicija 1.1.3. Neka grupa G djeluje na skup Ω i neka je G_x stabilizator elementa $x \in \Omega$ za djelovanje grupe G . Tada je $G_{g.x} = G_x^g$, $\forall g \in G$. Posebno, ako G djeluje tranzitivno na skup Ω , onda su svi stabilizatori međusobno konjugirani.

Korolar 1.1.2. Ako grupa G djeluje tranzitivno na skup Ω , onda su svi stabilizatori jednako-brojni. Posebno, svi stabilizatori su permutacijski izomorfne grupe.

Vidjeli smo da grupa G djeluje na G/H tranzitivno lijevim množenjem. Međutim, može se pokazati da je svako tranzitivno djelovanje grupe G na skup Ω ekvivalentno djelovanju grupe G na G/H , gdje je $H = G_x$, za $x \in \Omega$. Osim toga, dva su djelovanja grupe G na G/H_1 i G/H_2 ekvivalentna ako i samo ako je $H_1 = H_2$. Time je dokazana sljedeća lema koja omogućava da opišemo sve tranzitivne permutacijske reprezentacije grupe G , do na ekvivalenciju.

Lema 1.1.1. Neka grupa G djeluje tranzitivno na skupove Ω i Γ te neka je H stabilizator nekog elementa iz skupa Ω za djelovanje grupe G . Dva su djelovanja ekvivalentna ako i samo ako postoji element skupa Γ čiji je stabilizator jednak H .

Neka grupa G djeluje tranzitivno na skup Ω . Tada grupa G djeluje na skup $\Omega \times \Omega$ na sljedeći način:

$$g.(x_1, x_2) = (g.x_1, g.x_2).$$

Orbite za opisano djelovanje nazivaju se **orbitale** grupe G na skupu Ω . Skup $\{(x,x)|x \in \Omega\}$ naziva se **dijagonala skupa** Ω . Dijagonala skupa je jedna orbitala.

Definicija 1.1.8. Broj orbitala skupa Ω za djelovanje grupe G naziva se **rang grupe** G .

Orbitala **uparena** s orbitalom D je $D^* = \{(y,x)|(x,y) \in D\}$. Orbitala O je **samosparena** ako vrijedi $D = D^*$.

Neka grupa G djeluje tranzitivno na skup Ω i neka je $\alpha \in \Omega$. Za svaku orbitalu D grupe G definiramo:

$$\Delta(\alpha) = \{\beta \in \Omega | (\alpha, \beta) \in D\}.$$

Uočimo da je $\Delta(\alpha)$ G_α -orbita. Lako se provjeri da je preslikavanje $D \mapsto \Delta(\alpha)$ bijekcija sa skupa orbitala na skup G_α -orbita. Dijagonala se preslika u trivijalnu G_α -orbitu $\{\alpha\}$. Broj G_α -orbita jednak je broju orbitala grupe G i nazivamo ga **rang grupe** G . G_α -orbite nazivaju se **podorbite**, a njihove veličine **podstupnjevi** permutacijske grupe G .

Neka grupa G djeluje tranzitivno na skup Ω i neka je Δ orbita stabilizatora G_α na Ω . Definiramo

$$\Delta^* = \{g.\alpha | g \in G, g^{-1}.\alpha \in \Delta\}.$$

Tada je Δ^* također orbita za djelovanje G_α na skup Ω i zovemo ju G_α -orbita **uparena** s podorbitom Δ . Ako je $\Delta = \Delta^*$, onda Δ nazivamo **samosparenom** podorbitom.

Lema 1.1.2. Stabilizator G_α ima samosparenu orbitu različitu od dijagonale $\{\alpha\}$ ako i samo ako je red grupe G paran.

Napomena 1.1.2. Iz leme 1.1.2 slijedi da konačna grupa G nema samosparenih podorbitala različitih od dijagonale ako i samo ako je grupa G neparnog reda.

1.1.2. Primitivne grupe

Djelovanje grupe na skup Ω možemo proširiti na djelovanje grupe G na skup podskupova od Ω na sljedeći način:

$$g.\Delta = \{g.s | s \in \Delta\}, \Delta \subseteq \Omega, g \in G.$$

Stabilizator skupa Δ je $G_\Delta = \{g \in G | g.\Delta = \Delta\}$.

Definicija 1.1.9. Neka grupa G djeluje tranzitivno na skup Ω i neka je $\Delta \subseteq \Omega$. Ako za svaki $g \in G$ vrijedi $g.\Delta = \Delta$ ili $g.\Delta \cap \Delta = \emptyset$, skup Δ nazivamo **blok**.

Neka grupa G djeluje tranzitivno na skup Ω . Tada su Ω i $\{x\} \subseteq \Omega$ blokovi za svaki $x \in \Omega$. Opisani blokovi nazivaju se **trivijalni blokovi**. Svi ostali blokovi su netrivialni.

Propozicija 1.1.4. Neka grupa G djeluje tranzitivno na skup Ω i neka je $\Delta \subseteq \Omega$ netrivialan blok. Neka je $x \in \Delta$. Tada je $G_x \leq G_\Delta \leq G$.

Propozicija 1.1.5. Neka grupa G djeluje tranzitivno na skup Ω i neka za neki $x \in \Omega$ postoji prava podgrupa H grupe G takva da je $G_x < H$. Tada je $H.x$ netrivialni blok.

Definicija 1.1.10. Ako grupa G djeluje tranzitivno na skup Ω tako da ne postoje netrivialni blokovi, kažemo da G djeluje **primitivno** na skup Ω i da je G primitivna grupa.

Propozicija 1.1.6. Neka grupa G djeluje tranzitivno na skup Ω . Djelovanje grupe G na skup Ω je primitivno ako i samo ako je G_x maksimalna podgrupa grupe G , za svaki $x \in \Omega$.

1.1.3. Jednostavne grupe

Proučavanje konačnih grupa može se, prema Jordan-Hölderovom teoremu ([42]), svesti na proučavanje jednostavnih grupa. Grupa G je jednostavna ako nema pravih netrivialnih normalnih podgrupa. Jedine jednostavne komutativne grupe su cikličke grupe \mathbb{Z}_p , gdje je p prost broj. Nekomutativne jednostavne grupe dijele se na alternirajuće grupe stupnja većeg od četiri, grupe Liejevog tipa, klasične jednostavne grupe i sporadične jednostavne grupe. U klasične jednostavne grupe spadaju familije projektivnih linearnih, projektivnih ortogonalnih, projektivnih unitarnih i projektivnih simplektičkih grupa. Osim klasičnih jednostavnih grupa, postoji još 26 sporadičnih jednostavnih grupa.

Opća i specijalna linearna grupa

Neka je V vektorski prostor dimenzije n nad konačnim poljem \mathbb{F}_q , $q = p^k$, gdje je p prost broj, uz oznaku $V(n, q)$. Vektorski prostor $V(n, q)$ sadrži q^n elemenata.

Skup svih automorfizama vektorskog prostora čini grupu uz operaciju kompozicije funkcija. Svakom automorfizmu prostora $V(n, q)$ jednoznačno je pridružena regularna kvadratna matrica reda n nad poljem \mathbb{F}_q .

Definicija 1.1.11. **Opća linearna grupa**, u oznaci $GL(n, q)$, je skup svih regularnih kvadratnih matrica reda n nad poljem \mathbb{F}_q uz operaciju množenja matrica.

Red grupe $GL(n, q)$ jednak je broju uređenih n -torki linearno nezavisnih vektora prostora $V(n, q)$, tj.

$$|GL(n, q)| = (q^n - q^{n-1})(q^n - q^{n-2}) \cdots (q^n - 1) = q^{\frac{n(n-1)}{2}} \prod_{i=1}^n (q^i - 1).$$

Skup svih matrica iz grupe $GL(n, q)$ čije su determinante jednake 1 je grupa i naziva se **specijalna linearna grupa**, u oznaci $SL(n, q)$. $SL(n, q)$ je normalna podgrupa grupe $GL(n, q)$ indeksa $q - 1$ čiji red je

$$|SL(n, q)| = q^{\frac{n(n-1)}{2}} \prod_{i=2}^n (q^i - 1).$$

Kvocijentna grupa opće linearne grupe po svom centru $GL(n, q)/Z(GL(n, q))$ naziva se **projektivna opća linearna grupa**, u oznaci $PGL(n, q)$. Grupa $PGL(n, q)$ je reda

$$|PGL(n, q)| = q^{\frac{n(n-1)}{2}} \prod_{i=2}^n (q^i - 1).$$

Kvocijentna grupa specijalne linearne grupe po svom centru $SL(n, q)/Z(SL(n, q))$ naziva se **linearna grupa**, u oznaci $L(n, q)$. Grupa $L(n, q)$ je reda

$$|L(n, q)| = \frac{1}{M(q-1, n)} q^{\frac{n(n-1)}{2}} \prod_{i=2}^n (q^i - 1).$$

Linearna grupa je jednostavna, osim u slučajevima $(p, q) = (2, 2)$ i $(p, q) = (2, 3)$ ([4]).

Polulinearne grupe

Neka je $V(n, q)$ vektorski prostor nad poljem \mathbb{F}_q . Preslikavanje $f : V(n, q) \rightarrow V(n, q)$ je **polulinearano preslikavanje** ako vrijedi:

1. $f(u + v) = f(u) + f(v), \forall u, v \in V(n, q),$
2. $f(ku) = \alpha(k)f(u), \forall u \in V(n, q), \forall k \in \mathbb{F}_q,$ gdje je α automorfizam polja \mathbb{F}_q .

Skup svih bijektivnih polulinearanih preslikavanja vektorskog prostora $V(n, q)$ čini grupu, uz operaciju kompozicije funkcija. Ta grupa naziva se **polulinearna grupa**, u oznaci $\Gamma L(n, q)$. Primijetimo: ako je f bijektivno polulinearano preslikavanje i ako je automorfizam iz svojstva 2. trivijalan, f je automorfizam vektorskog prostora pa zaključujemo da $\Gamma L(n, q)$ sadrži sve automorfizme vektorskog prostora $V(n, q)$, tj. grupa $GL(n, q)$ je podgrupa grupe $\Gamma L(n, q)$ indeksa $|\text{Aut}(\mathbb{F}_q)|$.

Kvocijentna grupa polulinearne grupe po centru opće linearne grupe naziva se **projektivna polulinearna grupa**, u oznaci $P\Gamma L(n, q)$.

Projektivna geometrija $PG(n-1, q)$

Neka je na $V^*(n, q) = V(n, q) \setminus \{0\}$ definirana relacija: $x \sim y$ ako i samo ako postoji $\lambda \in \mathbb{F}_q, \lambda \neq 0$, takav da je $y = \lambda \cdot x$. Relacija \sim je relacija ekvivalencije i klase ekvivalencije te relacije su točke **projektivne geometrije** $PG(V(n, q))$. Klasu ekvivalencije elementa x za navedenu relaciju označavat ćemo sa $[x]$. Prostor $[U]$ projektivne geometrije $PG(V(n, q))$ je slika potprostora U vektorskog prostora $V(n, q)$ obzirom na preslikavanje $g : V(n, q) \rightarrow PG(V(n, q)), g(x) = [x]$. Ako je U prostor dimenzije k u vektorskom prostoru $V(n, q)$, onda kažemo da je $[U]$ potprostor dimenzije $k-1$ u projektivnoj geometriji $PG(V(n, q))$. Vidimo da je sama projektivna geometrija dimenzije $n-1$ pa koristimo oznaku $PG(n-1, q)$. Projektivna geometrija $PG(n-1, q)$ sadrži $\frac{q^n-1}{q-1}$ točaka ([4]).

Definicija 1.1.12. Preslikavanje $f : PG(n-1, q) \rightarrow PG(n-1, q)$ za koje vrijedi

$$U \subseteq U' \Leftrightarrow f(U) \subseteq f(U'), \forall U, U' \subseteq PG(n-1, q)$$

naziva se **kolineacija** ili **automorfizam** projektivne geometrije $PG(n-1, q)$.

Dokaz sljedećeg teorema nalazi se u [2].

Teorem 1.1.2 (Temeljni teorem projektivne geometrije). Neka je V vektorski prostor dimenzije veće ili jednake 3. Tada je puna grupa automorfizama projektivne geometrije $PG(V)$ izomorfna projektivnoj polulinearnoj grupi $PGL(V)$.

Bilinearne forme i jednostavne grupe

Neka je $V(n, q)$ vektorski prostor nad poljem \mathbb{F}_q . Preslikavanje $f : V(n, q) \times V(n, q) \rightarrow \mathbb{F}_q$ je **bilinearna forma** ako vrijedi:

1. $f(\alpha u, v) = f(u, \alpha v) = \alpha f(u, v), \forall u, v \in V(n, q), \forall \alpha \in \mathbb{F}_q,$
2. $f(u_1 + u_2, v) = f(u_1, v) + f(u_2, v), \forall u_1, u_2, v \in V(n, q),$
3. $f(u, v_1 + v_2) = f(u, v_1) + f(u, v_2), \forall u, v_1, v_2 \in V(n, q).$

Bilinearna forma je **simetrična** ako za svaka dva elementa $u, v \in V(n, q)$ vrijedi $f(u, v) = f(v, u)$.

Alternirajuća bilinearna forma je bilinearna forma f takva da je $f(u, u) = 0, \forall u \in V(n, q)$.

Preslikavanje $f : V(n, q) \times V(n, q) \rightarrow \mathbb{F}_q$ je **seskvilinearna forma** ako vrijedi:

1. $f(\alpha u, v) = \alpha f(u, v), \forall u, v \in V(n, q), \forall \alpha \in \mathbb{F}_q,$
2. $f(u, \alpha v) = \bar{\alpha} f(u, v), \forall u, v \in V(n, q), \forall \alpha \in \mathbb{F}_q,$ gdje je preslikavanje $\alpha \rightarrow \bar{\alpha}$ automorfizam polja \mathbb{F}_q reda 2,
3. $f(u_1 + u_2, v) = f(u_1, v) + f(u_2, v), \forall u_1, u_2, v \in V(n, q),$
4. $f(u, v_1 + v_2) = f(u, v_1) + f(u, v_2), \forall u, v_1, v_2 \in V(n, q).$

Hermitska forma je seskvilinearna forma f za koju vrijedi $f(v, u) = \overline{f(u, v)}$, gdje je preslikavanje $\alpha \rightarrow \bar{\alpha}$ automorfizam polja \mathbb{F}_q reda 2.

Forma $f : V(n, q) \times V(n, q) \rightarrow \mathbb{F}_q$ je **nedegenerirana** ako vrijedi

$$f(u, v) = 0, \forall v \in V(n, q) \Rightarrow u = 0.$$

Neka je forma (bilinearna ili seskvilinearna) na vektorskom prostoru $V(n, q)$ i neka je U potprostor vektorskog prostora $V(n, q)$. Tada je skup

$$U^\perp = \{u \in V(n, q) | f(u, v) = 0, \forall v \in U\}$$

potprostor vektorskog prostora $V(n, q)$.

Ako je f nedegenerirana forma, onda preslikavanje $o : V(n, q) \rightarrow V(n, q)$, $o(U) = U^\perp$ inducira permutaciju skupa potprostora vektorskog prostora $V(n, q)$ te je

$$U \subseteq U' \Rightarrow o(U') \subseteq o(U).$$

Definicija 1.1.13. Kompoziciju preslikavanja $g : V(n, q) \rightarrow PG(n-1, q)$, $g(x) = [x]$, i preslikavanja o nazivamo **korelacijom** projektivne geometrije $PG(n-1, q)$.

Ako je o^2 identično preslikavanje, onda se korelacija naziva **polaritet** projektivne geometrije $PG(n-1, q)$.

Forma $f : V(n, q) \times V(n, q) \rightarrow \mathbb{F}_q$ dopušta polaritet ako i samo ako vrijedi

$$f(u, v) = 0 \Leftrightarrow f(v, u) = 0.$$

Simetrična, alternirajuća i hermitska forma zadovoljavaju navedeni uvjet. Može se pokazati da su to ujedno i jedine forme koje dopuštaju polaritet. S obzirom na to, razlikujemo ortogonalni, simplektički i unitarni polaritet.

Definicija 1.1.14. Neka je f bilinearna/seskvilinearna forma i neka je A automorfizam vektorskog prostora $V(n, q)$. A je automorfizam bilinearne/seskvilinearne forme ako je $f(Au, Av) = f(u, v)$, $\forall u, v \in V(n, q)$.

Skup svih automorfizama forme čini grupu, uz operaciju kompozicije funkcija.

Neka je a simetrična forma vektorskog prostora $V(n, q)$. Kvocijentna grupa grupe automorfizama forme a po svom centru naziva se **ortogonalna grupa**, u oznaci $O(n, q)$. Za $n = 2m + 1$ neparan broj, ortogonalna grupa $O(2m + 1, q)$ je reda

$$|O(2m + 1, q)| = \frac{1}{M(q-1, 2)} q^{m^2} \prod_{i=1}^m (q^{2i} - 1)$$

i ona je jednostavna za $m \geq 2$. Za $n = 2m$ paran broj postoje dvije ortogonalne grupe $O^+(2m, q)$ i $O^-(2m, q)$. Za detaljnije proučavanje upućujemo čitatelja na [12].

Simplektička grupa, u oznaci $S(n, q)$, za $n = 2m$ paran broj, je kvocijentna grupa grupe automorfizama alternirajuće bilinearne forme po svom centru. Red grupe $S(2m, q)$ je

$$|S(2m, q)| = \frac{1}{M(q-1, 2)} q^{m^2} \prod_{i=1}^m (q^{2i} - 1).$$

Grupa $S(2m, q)$ je jednostavna za $m \geq 2$, osim grupe $S(4, 2)$ koja je izomorfna grupi S_6 .

Neka je $V(n, p^2)$ vektorski prostor i neka je G grupa svih automorfizama hermitske forme na $V(n, p^2)$ koji su sadržani u grupi $SL(n, p^2)$. Kvocijentna grupa grupe G po svom centru naziva se **unitarna grupa**, u oznaci $U(n, p)$. Red unitarne grupe je

$$|U(n, p)| = \frac{1}{M(p+1, n)} p^{\frac{n(n-1)}{2}} \prod_{i=2}^n (p^i - (-1)^i)$$

i ona je jednostavna za $n \geq 3$, osim u slučaju grupe $U(3, 2)$ ([4]).

1.1.4. Klasifikacija primitivnih grupa

Klasifikacija primitivnih grupa blisko je povezana s proučavanjem maksimalnih podgrupa simetrične i alternirajuće grupe. Ključ za analizu konačnih primitivnih grupa je proučavanje postolja grupe. **Postolje** konačne grupe G , u oznaci $\text{soc}(G)$, je podgrupa grupe G generirana elementima minimalnih normalnih podgrupa grupe G . Posebno, ako je G primitivna permutacijska grupa, onda je $\text{soc}(G)$ izomorfno direktnom produktu izomorfnih jednostavnih grupa. Opisujući kako je postolje uloženo u grupu G , O’Nan-Scottov teorem daje klasifikaciju primitivnih grupa. Opis tipova primitivnih grupa u teoremu, kao i dokaz teorema, mogu se pronaći u [25].

Teorem 1.1.3 (O’Nan-Scott). Neka je G primitivna permutacijska grupa. Tada je G permutacijski izomorfna jednoj od sljedećih grupa:

1. grupi afinog tipa,
2. grupi dijagonalnog tipa,
3. grupi skoro jednostavnog tipa,
4. grupi produktnog tipa,
5. grupi uvinutog vjenacnog tipa.

1.1.5. Konačna polja

Pretpostavljamo da je čitatelj upoznat s definicijom polja, kao i osnovnim pojmovima teorije polja, kao na primjer polje \mathbb{Z}_p ostataka modulo p , gdje je p prost broj, proširenja polja, prsten polinoma.

Neka je p prost broj i neka je n prirodan broj. Tada postoji jedinstveno (do na izomorfizam) konačno polje reda $q = p^n$. Neka je $\mathbb{F}_p = \mathbb{Z}_p$ konačno polje reda p i \mathbb{F}_q konačno polje reda $q = p^n$. Polje \mathbb{F}_q može se realizirati kao proširenje polja \mathbb{F}_p korijenom ireducibilnog polinoma $f(x)$ stupnja n nad poljem \mathbb{F}_p . Elementi polja \mathbb{F}_q u tom slučaju su polinomi stupnja manjeg ili jednakog $n - 1$ s koeficijentima iz \mathbb{Z}_p , a operacije su zbrajanje i množenje polinoma u $\mathbb{Z}_p[x]$, pri čemu se nakon množenja računa ostatak pri dijeljenju polinomom $f(x)$.

Definicija 1.1.15. Neka je p prost broj, n prirodan broj i neka je $q = p^n$. Za cjelobrojnu matricu $A = [a_{ij}]$ definiramo matricu $A_p = [a_{ij}']$, gdje je $a_{ij}' = a_{ij} \pmod{p}$.

Uočimo da je matrica A_p matrica s elementima iz polja \mathbb{F}_p . Matricu A_p možemo promatrati kao matricu s elementima iz polja \mathbb{F}_q jer je svaki element polja \mathbb{F}_p ujedno i element polja \mathbb{F}_q .

Napomena 1.1.3. Elementi koji su jednaki 0 u polju \mathbb{F}_q su također 0 u polju \mathbb{F}_{q^2} jer su elementi polja \mathbb{F}_q u polju \mathbb{F}_{q^2} polinomi stupnja najviše 1 s koeficijentima iz \mathbb{F}_q .

1.2. OSNOVNI POJMOVI TEORIJE DIZAJNA

U ovom poglavlju navest ćemo osnovne pojmove teorije dizajna. Za detaljnije čitanje upućujemo čitatelja na [5, 12, 54].

Incidencijske strukture

Definicija 1.2.1. **Incidencijska struktura** \mathcal{D} je uređena trojka $(\mathcal{P}, \mathcal{B}, \mathcal{J})$, gdje su \mathcal{P} i \mathcal{B} neprazni disjunktne skupovi i $\mathcal{J} \subseteq \mathcal{P} \times \mathcal{B}$. Elemente skupa \mathcal{P} nazivamo **točkama**, elemente skupa \mathcal{B} **blokovima**, a relaciju \mathcal{J} **relacijom incidencije**.

Broj blokova koji su incidentni s točkom P nazivamo **stupnjem točke** P i broj točaka koje su incidentne s blokom B nazivamo **stupnjem bloka** B .

Prebrojavanjem uređenih parova (P, B) , gdje je P točka incidencijske strukture i B blok incidentan s točkom P , dobivamo sljedeće tvrdnje, čiji se dokazi mogu pronaći u [54].

Propozicija 1.2.1. Neka je $\mathcal{D} = (\mathcal{P}, \mathcal{B}, \mathcal{J})$ incidencijska struktura sa v točaka i b blokova za koju su stupnjevi točaka r_1, \dots, r_v i stupnjevi blokova k_1, \dots, k_b . Tada je

$$\sum_{i=1}^v r_i = \sum_{i=1}^b k_i.$$

Korolar 1.2.1. Za incidencijsku strukturu sa v točaka i b blokova u kojoj svaka točka ima stupanj r i u kojoj svaki blok ima stupanj k vrijedi $vr = bk$.

Svakoj incidencijskoj strukturi možemo pridružiti matricu incidencije na sljedeći način.

Definicija 1.2.2. Neka je $\mathcal{D} = (\mathcal{P}, \mathcal{B}, \mathcal{J})$ incidencijska struktura takva da je $\mathcal{P} = \{P_1, \dots, P_v\}$ i $\mathcal{B} = \{B_1, \dots, B_b\}$. **Matrica incidencije** incidencijske strukture \mathcal{D} je $b \times v$ matrica $M = [m_{ij}]$, pri čemu je

$$m_{ij} = \begin{cases} 1, & P_j \in B_i, \\ 0, & \text{inače.} \end{cases}$$

Definicija 1.2.3. Neka su $\mathcal{D} = (\mathcal{P}, \mathcal{B}, \mathcal{J})$ i $\mathcal{D}' = (\mathcal{P}', \mathcal{B}', \mathcal{J}')$ incidencijske strukture. Bijektivno preslikavanje $f : \mathcal{P} \cup \mathcal{B} \rightarrow \mathcal{P}' \cup \mathcal{B}'$ je **izomorfizam** iz \mathcal{D} na \mathcal{D}' ako

1. f preslikava \mathcal{P} na \mathcal{P}' i \mathcal{B} na \mathcal{B}' ,
2. $(P, B) \in \mathcal{J} \Leftrightarrow (f(P), f(B)) \in \mathcal{J}', \forall P \in \mathcal{P} \text{ i } \forall B \in \mathcal{B}$.

Ako je $\mathcal{D} = \mathcal{D}'$, preslikavanje f nazivamo **automorfizam**.

Skup svih automorfizama incidencijske strukture \mathcal{D} je grupa s obzirom na kompoziciju funkcija i naziva se **puna grupa automorfizama** incidencijske strukture \mathcal{D} , u oznaci $\text{Aut}(\mathcal{D})$.

Napomena 1.2.1. Grupa automorfizama incidencijske strukture djeluje na skup točaka i blokova te strukture.

Dizajni

Teorija dizajna bavi se pitanjima o mogućnosti raspoređivanja elemenata konačnog skupa u podskupove na način da određena svojstva "ravnoteže" budu zadovoljena ([54]). U poglavlju 1.3.1. opisat ćemo vezu između dizajna i usmjerenih grafova. Dokazi tvrdnji navedenih u nastavku mogu se pronaći u [54].

Definicija 1.2.4. Konačna incidencijska struktura $\mathcal{D} = (\mathcal{P}, \mathcal{B}, \mathcal{J})$ je t - (v, k, λ) dizajn ako vrijedi sljedeće:

1. $|\mathcal{P}| = v$,
2. svaki element skupa \mathcal{B} je incidentan s točno k elemenata skupa \mathcal{P} ,
3. svakih t elemenata skupa \mathcal{P} je incidentno s točno λ elemenata skupa \mathcal{B} .

Propozicija 1.2.2. Neka je $\mathcal{D} = (\mathcal{P}, \mathcal{B}, \mathcal{J})$ t - (v, k, λ) dizajn. Tada je \mathcal{D} ujedno i s - (v, k, λ_s) dizajn $\forall s \in \{1, 2, \dots, t-1\}$, gdje je

$$\lambda_s \binom{k-s}{t-s} = \lambda \binom{v-s}{t-s}.$$

Napomena 1.2.2. Iz prethodne propozicije slijedi da je svaki t -dizajn ujedno i 1-dizajn.

Korolar 1.2.2. Ako postoji t - (v, k, λ) dizajn, onda $\binom{k-s}{t-s}$ dijeli $\lambda \binom{v-s}{t-s}$, za svaki $s \in \{1, 2, \dots, t-1\}$.

Korolar 1.2.2 daje nužan uvjet postojanja t -dizajna. U slučaju da je $t = 1$, ovaj uvjet je i dovoljan.

Definicija 1.2.5. Nepotpun t - (v, k, λ) dizajn je **simetričan** ako je $b = v$.

Uvjet iz prethodne definicije ekvivalentan je uvjetu $r = k$.

Propozicija 1.2.3. Ako je t - (v, k, λ) dizajn simetričan, onda je $t \leq 2$.

Iz propozicije 1.2.3 slijedi da je nužan uvjet za postojanje simetričnog blokovnog dizajna $k(k-1) = \lambda(v-1)$. U nastavku navodimo još dva nužna uvjeta egzistencije dizajna.

Teorem 1.2.1 (Schützenberger). Neka je \mathcal{D} simetričan 2 - (v, k, λ) dizajn. Ako je v paran broj, onda je $k - \lambda$ kvadrat nekog prirodnog broja.

Teorem 1.2.2 (Bruck-Ryser-Chowla). Neka je \mathcal{D} simetričan 2 - (v, k, λ) dizajn. Ako je v neparan broj, onda jednačina

$$x^2 = (k - \lambda)y^2 + (-1)^{\frac{v-1}{2}} \lambda z^2$$

ima rješenje $(x, y, z) \in \mathbb{Z}^3$ takvo da je $(x, y, z) \neq (0, 0, 0)$.

Primjer 1.2.1. Neka je

$$\mathcal{P} = \{1, 2, 3, 4, 5, 6, 7\}$$

i

$$\mathcal{B} = \{\{1, 2, 4\}, \{2, 3, 5\}, \{3, 4, 6\}, \{4, 5, 7\}, \{1, 5, 6\}, \{2, 6, 7\}, \{1, 3, 7\}\}.$$

Tada je $\mathcal{D} = (\mathcal{P}, \mathcal{B})$ simetrični $2 - (7, 3, 1)$ dizajn.

Dizajn \mathcal{D} je najmanja projektivna ravnina reda 2, poznat i pod nazivom Fanova ravnina. Matrica incidencije navedenog dizajna je

$$M = \begin{bmatrix} 1 & 1 & 0 & 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 & 1 & 0 & 1 \\ 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 & 1 \\ 1 & 0 & 1 & 0 & 0 & 0 & 1 \end{bmatrix},$$

a puna grupa automorfizama je $\text{Aut}(\mathcal{D}) = PGL(3, 2)$.

Definicija 1.2.6. **Flag** ili **zastavica** t - (v, k, λ) dizajna je incidentan par točke i bloka.

U nastavku rada koristit ćemo naziv *flag*.

Definicija 1.2.7. Kažemo da je t -dizajn **flag-tranzitivan** ako njegova grupa automorfizama djeluje tranzitivno na skup flagova dizajna.

Definicija 1.2.8. Neka je p prost broj i neka je \mathcal{D} 1 - (v, k, λ) dizajn takav da je $k \equiv a \pmod{p}$ i $|B_i \cap B_j| \equiv d \pmod{p}$, gdje su B_i i B_j različiti blokovi dizajna \mathcal{D} , $i, j \in \{1, \dots, b\}$. Dizajn \mathcal{D} zovemo **slabo p -samoortogonalan dizajn**.

Posebno, slabo p -samoortogonalan dizajn za koji je $a = d = 0$ zovemo **p -samoortogonalan dizajn**.

Napomena 1.2.3. Ako je $p = 2$, dizajn \mathcal{D} iz prethodne definicije zovemo slabo samoortogonalan dizajn/samoortogonalan dizajn.

1.3. OSNOVNI POJMOVI TEORIJE GRAFOVA

Početak razvoja teorije grafova povezuje se s Eulerovim rješavanjem problema Königsberških mostova iz 1736. godine, objavljenom 1741. godine u radu [27]. U drugom poglavlju ovog rada konstruirat ćemo usmjerene regularne grafove.

Definicija 1.3.1. Neka je $\mathcal{G} = (\mathcal{V}, \mathcal{E}, \mathcal{J})$ konačna incidencijska struktura. \mathcal{G} je **graf** ako je svaki element skupa \mathcal{E} incidentan s dva (ne nužno različita) elementa skupa \mathcal{V} . Elementi skupa \mathcal{V} su **vrhovi**, a elementi skupa \mathcal{E} **bridovi** grafa \mathcal{G} .

Dva vrha x i y su susjedna ako su incidentna s istim bridom. Broj bridova incidentnih s vrhom x naziva se **stupanj vrha** x . Brid koji je incidentan s vrhom x dva puta naziva se **petlja**.

Definicija 1.3.2. Graf sa n vrhova u kojemu je svaki par različitih vrhova incidentan s točno jednim bridom naziva se **potpuni graf**, uz oznaku K_n .

Put u grafu \mathcal{G} je netrivialan niz $x_0 e_1 x_1 e_2 \dots e_k x_k$, gdje su x_0, \dots, x_k vrhovi grafa \mathcal{G} i e_i , $i = 1, \dots, k$, bridovi koji su incidentni s vrhovima x_{i-1} i x_i , u kojemu su svi vrhovi i svi bridovi međusobno različiti.

Definicija 1.3.3. Graf \mathcal{G} je **povezan** ako za svaka dva vrha tog grafa postoji put koji ih povezuje.

Definicija 1.3.4. **Matrica susjedstva** grafa \mathcal{G} sa n vrhova, x_1, \dots, x_n , je $n \times n$ matrica $A = (a_{ij})$, gdje je a_{ij} broj bridova incidentnih s vrhovima x_i i x_j .

Definicija 1.3.5. Graf bez petlji u kojem su svaka dva vrha incidentna s najviše jednim bridom je **jednostavan**.

Matrica susjedstva jednostavnog grafa je matrica čiji su elementi jednaki nula ili jedan i svi dijagonalni elementi su jednaki nuli.

Definicija 1.3.6. Neka je \mathcal{G} jednostavan graf. Jednostavan graf \mathcal{G}^C u kojem su dva različita vrha susjedna ako i samo ako nisu susjedni vrhovi grafa \mathcal{G} naziva se **komplementarni graf** grafa \mathcal{G} .

Definicija 1.3.7. Graf je **k -regularan** ako su svi vrhovi tog grafa stupnja k .

Definicija 1.3.8. Neka je $\mathcal{G} = (\mathcal{V}, \mathcal{E}, \mathcal{J})$ graf sa n vrhova. Graf \mathcal{G} je **jako regularan graf** (ili kraće *SRG*, od engleskog izraza *Strongly Regular Graph*) s parametrima (n, k, λ, μ) , uz oznaku $SRG(n, k, \lambda, \mu)$, ako vrijedi:

1. \mathcal{G} je jednostavan k -regularan graf,
2. svaka dva susjedna vrha imaju točno λ zajedničkih susjednih vrhova,

3. svaka dva nesusjedna vrha imaju točno μ zajedničkih susjednih vrhova.

Matrica susjedstva $A = A(\mathcal{G})$ jako regularnog grafa zadovoljava

$$\begin{aligned} A^2 &= kI + \lambda A + \mu(J - I - A), \\ AJ &= JA = kJ, \end{aligned}$$

gdje je $J = J_n$ matrica čije su sve vrijednosti jednake 1, a $I = I_n$ je jedinična matrica.

Dokazi sljedećih dviju propozicija mogu se pronaći u [12].

Propozicija 1.3.1. Neka je \mathcal{G} jako regularan graf s parametrima (n, k, λ, μ) . Tada je i njegov komplement \mathcal{G}^C jako regularan graf s parametrima $(n, n - k - 1, n - 2k + \mu - 2, n - 2k + \lambda)$.

Propozicija 1.3.2. Neka je \mathcal{G} jako regularan graf s parametrima (n, k, λ, μ) . Tada je

$$k(k - \lambda - 1) = (n - k - 1)\mu.$$

Kvazi-jako regularne grafove definirao je Felix Goldberg 2006. godine u članku [31].

Definicija 1.3.9. Kvazi-jako regularan graf (ili kraće *QSRG* od engleskog izraza *Quasi-Strongly Regular Graph*) s parametrima $(n, k, a; c_1, c_2, \dots, c_p)$, u oznaci $QSRG(n, k, a; c_1, c_2, \dots, c_p)$, je k -regularan graf sa n vrhova takav da

- (i) za svaka dva susjedna vrha x i y broj putova duljine 2 od x do y je a ,
- (ii) za svaka dva različita vrha x i y koja nisu susjedna broj putova duljine 2 od x do y je c_i , za $1 \leq i \leq p$,
- (iii) za svaki $1 \leq i \leq p$ postoje različiti vrhovi x i y koji nisu susjedni takvi da je broj putova duljine 2 od x do y jednak c_i .

Broj p zovemo **razred** kvazi-jako regularnog grafa. Bez smanjenja općenitosti, pretpostavljamo da je $c_1 > c_2 > \dots > c_p$.

Definicija 1.3.10. **Usmjereni graf** ili **digraf** \mathcal{G} je uređeni par $(\mathcal{V}, \mathcal{E})$ nepraznog konačnog skupa $\mathcal{V}(\mathcal{G})$, čije elemente zovemo **vrhovi**, i konačne familije $\mathcal{E}(\mathcal{G})$ uređenih parova elemenata skupa $\mathcal{V}(\mathcal{G})$ koje zovemo **lukovi**.

Dakle, digraf je uređeni par skupa vrhova \mathcal{V} i skupa uređenih parova (x, y) , $x, y \in \mathcal{V}$, koje zovemo lukovima. Vrh x je **početni vrh**, a vrh y **krajnji vrh** luka (x, y) .

Usmjereni graf takav da za svaki luk $(x, y) \in \mathcal{E}$, $x, y \in \mathcal{V}$, postoji luk $(y, x) \in \mathcal{E}$ je (neusmjereni) graf.

Definicija 1.3.11. **Izomorfizam** usmjerenih grafova $\mathcal{G}_1 = (\mathcal{V}_1, \mathcal{E}_1)$ i $\mathcal{G}_2 = (\mathcal{V}_2, \mathcal{E}_2)$ je bijekcija $f: \mathcal{V}_1 \rightarrow \mathcal{V}_2$ takva da za svaki par vrhova $u, v \in \mathcal{V}_1$ vrijedi:

$$u \rightarrow v \in \mathcal{E}_1 \text{ ako i samo ako } f(u) \rightarrow f(v) \in \mathcal{E}_2.$$

Za dva digrafa kažemo da su izomorfni ako postoji izomorfizam između njih.

Dva vrha x i y digrafa su susjedna ako postoji luk (x, y) ; luk (x, y) označavat ćemo sa $x \rightarrow y$.

Izlazni stupanj vrha $x \in \mathcal{V}(\mathcal{G})$ je broj lukova oblika $x \rightarrow w$. **Ulazni stupanj vrha** $y \in \mathcal{V}(\mathcal{G})$ je broj lukova oblika $x \rightarrow y$.

Definicija 1.3.12. Usmjereni graf je **k -regularan** ako je za svaki njegov vrh broj ulaznih i izlaznih susjeda jednak k .

Definicija 1.3.13. **Turnir** $T = (\mathcal{V}, \mathcal{E})$ reda n (n -turnir) je usmjereni graf kojem skup vrhova \mathcal{V} ima n elemenata i skup lukova $\mathcal{E} \subseteq \mathcal{V} \times \mathcal{V}$ je takav da je svaki par vrhova x i y povezan točno jednim od lukova $x \rightarrow y$ ili $y \rightarrow x$.

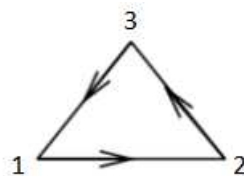
Definicija 1.3.14. Turnir T reda n je **dvostruko regularan** s parametrima (n, k, λ', μ') , u oznaci $DRT(n, k, \lambda', \mu')$, ako

- (i) T je k -regularan,
- (ii) svaka dva susjedna vrha imaju λ' zajedničkih izlaznih susjeda,
- (iii) svaka dva od tih vrhova imaju dodatnih μ' izlaznih susjeda koji im nisu zajednički.

Dokazano je da su dvostruko regularni turniri ekvivalentni kososimetričnim Hadamardovim matricama. Dokaz se može pronaći u [51].

Teorem 1.3.1. Neka je $n = 4j + 3$, gdje je j nenegativni cijeli broj. Tada postoji dvostruko regularan turnir s n vrhova ako i samo ako postoji kososimetrična Hadamardova matrica reda $n + 1$.

Primjer 1.3.1. Usmjereni ciklus duljine tri je dvostruko regularan turnir s parametrima $(3, 1, 0, 1)$.



Slika 1.1: $DRT(3, 1, 0, 1)$

Za matricu susjedstva dvostruko regularnog turnira vrijedi jednakost iz sljedeće leme, a dokaz se može pronaći u [53].

Lema 1.3.1. Ako je \mathcal{G} dvostruko regularan turnir s parametrima (n, k, λ', μ') , onda je

$$AA^T = kI + (k - 1 - \lambda')A + (k - \mu')(J - I - A).$$

Usmjereni graf je **normalan** ako je njegova matrica susjedstva A normalna, odnosno, ako vrijedi $AA^T = A^T A$. Slijedi da je digraf normalan ako i samo ako je za dva (ne nužno različita) vrha x i y broj zajedničkih izlaznih susjeda od x i y jednak broju zajedničkih ulaznih susjeda od x i y .

Definicija 1.3.15. Normalno regularan digraf s parametrima (n, k, λ'', μ'') , u oznaci $\text{NRD}(n, k, \lambda'', \mu'')$, je usmjereni graf na n vrhova takav da

- (i) svaki vrh ima izlazni stupanj k ;
- (ii) svaki par nesusjednih vrhova ima točno μ'' zajedničkih izlaznih susjeda;
- (iii) svaki par vrhova x, y takvih da postoji točno jedan brid $x \rightarrow y$ ili $y \rightarrow x$ ima točno λ'' zajedničkih izlaznih susjeda;
- (iv) svaki par vrhova x, y takvih da je $x \leftrightarrow y$ ima točno $2\lambda'' - \mu''$ zajedničkih izlaznih susjeda.

Normalno regularan digraf je **asimetričan** ako ne postoji par x, y za koji je $x \leftrightarrow y$.

Propozicija 1.3.3. Neka je \mathcal{G} digraf sa n vrhova i neka je A matrica susjedstva od \mathcal{G} . Tada je \mathcal{G} normalno regularan digraf s parametrima (n, k, λ'', μ'') ako i samo ako je svaka vrijednost matrice na dijagonali jednaka nuli i

$$AA^T = kI + \lambda''(A + A^T) + \mu''(J - I - A - A^T).$$

Normalno regularan digraf je asimetričan ako i samo ako je matrica $A + A^T$, $(0, 1)$ -matrica.

Prisjetimo se definicije jako regularnog grafa. Parametar λ jako regularnog grafa označava broj putova duljine dva od vrha x do vrha y ako su x i y susjedni vrhovi, a parametar μ je broj putova duljine dva od vrha x do vrha y ako x i y nisu susjedni vrhovi.

Usmjerene jako regularne grafove prvi je definirao Art Duval u članku [26].

Definicija 1.3.16. Regularan usmjereni graf $\mathcal{G} = (\mathcal{V}, \mathcal{E}, \mathcal{J})$ stupnja k sa n vrhova je **usmjereni jako regularan graf** (ili kraće *DSRG*, od engleskog izraza *Directed Strongly Regular Graph*), uz oznaku

$\text{DSRG}(n, k, \lambda, \mu, t)$, ako je broj usmjerenih putova duljine dva od svakog vrha x do svakog vrha y točno λ ako postoji luk $x \rightarrow y$, točno t ako $x = y$ i točno μ ako ne postoji luk $x \rightarrow y$.

Matrica susjedstva $A = A(\mathcal{G})$ usmjerenog jako regularnog grafa zadovoljava

$$A^2 = tI + \lambda A + \mu(J - I - A), \tag{1.1}$$

$$AJ = JA = kJ. \tag{1.2}$$

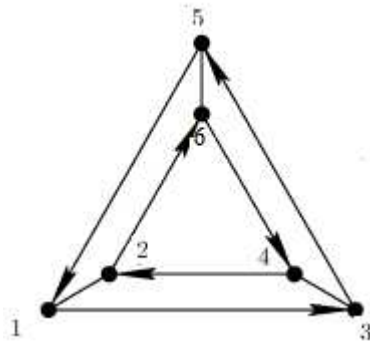
Jasno je da je usmjereni jako regularan graf sa $t = k$ zapravo jako regularan graf.

Popis poznatih usmjerenih jako regularnih grafova i njihovih parametara, kao i parametara koji zadovoljavaju nužne uvjete za postojanje istih, te informacije o konstrukciji i nepostojanju usmjerenih jako regularnih grafova sa n vrhova, $n \leq 110$, dane su na poveznici <http://homepages.cwi.nl/~aeb/math/dsrg/dsrg.html>.

Primjer 1.3.2. Usmjereni regularan graf s matricom susjedstva

$$A = \begin{bmatrix} 0 & 1 & 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 0 \end{bmatrix}$$

je usmjereni jako regularan graf s parametrima $(6, 2, 0, 1, 1)$.



Slika 1.2: DSRG(6,2,0,1,1)

U nastavku navodimo najvažnije rezultate i nužne uvjete za postojanje navedenih usmjerenih grafova. Dokazi lema i teorema koji slijede mogu se pronaći u [26].

Teorem 1.3.2. Ako je \mathcal{G} usmjereni jako regularan graf (n, k, λ, μ, t) s matricom susjedstva A i \mathcal{G} nije

- (i) (neusmjeren) jako regularan graf ($t = k$) ili
- (ii) potpuni graf ($A = J - I$),

tada je A ekvivalentna Hadamardovoj matrici ($A + A^T = J - I, AA^T = (\mu - 1)J + \mu I$), ili je za neki pozitivan cijeli broj d ,

$$\begin{aligned} k(k + (\mu - \lambda)) &= t + (n - 1)\mu, \\ (\mu - \lambda)^2 + 4(t - \mu) &= d^2, \\ d | 2k - (\mu - \lambda)(n - 1), \\ \frac{2k - (\mu - \lambda)(n - 1)}{d} &\equiv n - 1 \pmod{2}, \\ \left| \frac{2k - (\mu - \lambda)(n - 1)}{d} \right| &\leq n - 1. \end{aligned}$$

Lema 1.3.2. Ako je \mathcal{G} DSRG(n, k, λ, μ, t) s matricom susjedstva A , tada je komplementaran digraf \mathcal{G}' DSRG($n, k', \lambda', \mu', t'$) s matricom susjedstva $A' = J - I - A$, gdje

$$\begin{aligned} k' &= (n - 2k) + (k - 1), \\ \lambda' &= (n - 2k) + (\mu - 2), \\ \mu' &= (n - 2k) + \lambda, \\ t' &= (n - 2k) + (t - 1). \end{aligned}$$

Navodimo i nužne uvjete za postojanje usmjerenih jako regularnih grafova s parametrima (n, k, λ, μ, t).

Teorem 1.3.3. Ako je \mathcal{G} DSRG(n, k, λ, μ, t), tada vrijedi

$$\begin{aligned} 0 &\leq \lambda < t < k, \\ 0 &< \mu \leq t < k. \end{aligned}$$

Teorem 1.3.4. Ako je \mathcal{G} DSRG(n, k, λ, μ, t), tada vrijedi

$$-2(k - t - 1) \leq \mu - \lambda \leq 2(k - t).$$

Duval je promatrao i usmjerene jako regularne grafove sa $t = \mu$.

Lema 1.3.3. Ako je \mathcal{G} usmjereni jako regularan graf s parametrima (n, k, λ, μ, t), gdje je $t = \mu$ i $\lambda = 0$, onda postoji cijeli broj b takav da je $k = \mu b$ i $n = \mu b(b + 1)$.

Lema 1.3.3 pokazuje nužnost uvjeta $\mu | k$. Sljedeći teorem daje i dovoljan uvjet.

Teorem 1.3.5. Usmjereni jako regularan graf s parametrima (n, k, λ, μ, t), gdje je $t = \mu$ i $\lambda = 0$ postoji, ako i samo ako $\mu | k$ i $n = k(k + \mu) / \mu$.

Lema 1.3.4. Postoji usmjereni jako regularan graf s parametrima ($k(k + 1), k, 0, 1, 1$).

Dokaz. Konstruiramo matricu susjedstva A tog usmjerenog grafa. Neka su M_r , $i = 1, \dots, r$, matrice definirane na način:

$$(M_r)_{ij} = 1 \text{ ako i samo ako je } i = r,$$

odnosno, M_r u retku r ima sve jedinice, a nule u svim preostalim retcima. Neka je

$$A = \begin{bmatrix} 0 & M_1 & M_2 & \cdots & M_{k-1} & M_k \\ M_1 & 0 & M_2 & \cdots & M_{k-1} & M_k \\ \cdots & \cdots & \cdots & \cdots & \cdots & \cdots \\ M_1 & M_2 & M_3 & \cdots & M_k & 0 \end{bmatrix}.$$

Lako se vidi da je $A^2 + A = J$ i $AJ = JA = kJ$, pa je A matrica susjedstva usmjerenog jako regularnog grafa s parametrima ($k(k + 1), k, 0, 1, 1$). ■

Primjer 1.3.3. Neka je $k = 3$. Tada je matrica

$$A = \begin{bmatrix} 0 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 \\ 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 \\ 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 \\ 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & 0 \end{bmatrix},$$

dobivena konstrukcijom iz dokaza leme 1.3.4, matrica susjedstva usmjerenog jako regularnog grafa s parametrima $(12,3,0,1,1)$.

Duval ([26]) je konstruirao usmjerene jako regularne grafove i koristeći Kroneckerov produkt matrica.

Definicija 1.3.17. Kroneckerov produkt matrice $A \in \mathcal{M}_{mn}$ i matrice $B \in \mathcal{M}_{rs}$ definiramo kao

$$A \otimes B = \begin{bmatrix} a_{11}B & \cdots & a_{1n}B \\ \vdots & & \vdots \\ a_{m1}B & \cdots & a_{mn}B \end{bmatrix}.$$

Matrica $A \otimes B$ je matrica tipa (mr, ns) .

Neka svojstva Kroneckerovog produkta su sljedeća:

1. $A \otimes (B + C) = A \otimes B + A \otimes C$,
2. $(B + C) \otimes A = B \otimes A + C \otimes A$,
3. $(kA) \otimes B = A \otimes (kB) = k(A \otimes B)$,
4. $(A \otimes B) \otimes C = A \otimes (B \otimes C)$,
5. $A \otimes 0 = 0 \otimes A = 0$,
6. $(A \otimes B) \cdot (C \otimes D) = (A \cdot C) \otimes (B \cdot D)$.

Teorem 1.3.6. Neka je A matrica susjedstva usmjerenog jako regularnog grafa s parametrima (n, k, λ, μ, t) , $A \neq J_n - I_n$, i neka je $J_m = [a_{ij}]$ $m \times m$ matrica takva da je $a_{ij} = 1, \forall i, j = 1, \dots, m$ ($m > 1$). Tada je $A \otimes J_m$ matrica susjedstva digrafa s parametrima (n, k, λ, μ, t) ako i samo ako je $t = \mu$. U tom slučaju skup parametara za usmjereni graf s matricom susjedstva $A \otimes J_m$ je $(nm, km, \lambda m, \mu m, tm)$. Rezultat vrijedi i za $J_m \otimes A$.

Primjer 1.3.4. Matrica $A' = A \otimes J_2$, gdje je A matrica susjedstva usmjerenog jako regularnog grafa iz primjera 1.3.2, je matrica susjedstva usmjerenog jako regularnog grafa s parametrima $(12,4,0,2,2)$.

$$A' = \begin{bmatrix} 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \end{bmatrix}$$

Duval je u svom članku [26] opisao i usmjerene jako regularne grafove s parametrima $\lambda = 0$ i $\mu = t = 1$.

Usmjerene kvazi-jako regularne grafove definirali su Guo, Jia i Gengsheng 2022. godine, u [33]. Dokazi se mogu pronaći u [33].

Definicija 1.3.18. Kvazi-jako regularan digraf (ili kraće *QSRD*, od engleskog izraza *Quasi-Strongly Regular Digraph*) s parametrima $(n, k, t, a; c_1, c_2, \dots, c_p)$, u oznaci $QSRD(n, k, t, a; c_1, c_2, \dots, c_p)$, je k -regularan digraf sa n vrhova takav da

- (i) svaki vrh je incidentan sa t neusmjerenih bridova,
- (ii) za svaka dva susjedna vrha x i y broj putova duljine 2 od x do y je a ,
- (iii) za svaka dva različita vrha x i y koja nisu susjedna broj putova duljine 2 od x do y je c_i , za $1 \leq i \leq p$,
- (iv) za svaki $1 \leq i \leq p$ postoje različiti vrhovi x i y koji nisu susjedni takvi da je broj putova duljine 2 od x do y jednak c_i .

Broj p zovemo **razred** kvazi-jako regularnog digrafa. Bez smanjenja općenitosti, pretpostavljamo da je $c_1 > c_2 > \dots > c_p$.

Kvazi-jako regularan digraf (*QSRD*) je jako regularan digraf (*DSRG*) ako je $p = 1$, a kvazi-jako regularan graf (*QSRG*) za $t = k$.

Propozicija 1.3.4. Neka je \mathcal{G} digraf sa n vrhova i neka je A matrica susjedstva od \mathcal{G} . Tada je \mathcal{G} QSRD s parametrima $(n, k, t, a; c_1, c_2, \dots, c_p)$ ako i samo ako

$$AJ = JA = kJ,$$

$$A^2 = tI + aA + c_1C_1 + c_2C_2 + \dots + c_pC_p,$$

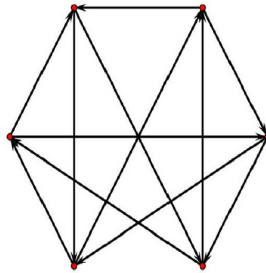
za neke nenul $(0, 1)$ -matrice C_1, C_2, \dots, C_p takve da je $C_1 + C_2 + \dots + C_p = J - I - A$.

U radu [33] posebno su proučavani usmjereni kvazi-jako regularni grafovi razreda $p = 2$ te konstruirani primjeri svih takvih usmjerenih grafova na najviše sedam vrhova. Također, konstrukcijom iz Cayleyevih digrafova, opisanom u istom radu, konstruirani su usmjereni kvazi-jako regularni grafovi razreda $p > 1$ na najviše osam vrhova.

Primjer 1.3.5. Usmjereni regularan graf s matricom susjedstva

$$A = \begin{bmatrix} 0 & 0 & 0 & 1 & 0 & 1 \\ 1 & 0 & 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 1 & 0 & 0 & 0 \end{bmatrix}$$

je usmjeren kvazi-jako regularan graf s parametrima $(6, 2, 0, 0; 2, 0)$.



Slika 1.3: QSRD(6,2,0,0;2,0)

Neka su \mathcal{G}_1 i \mathcal{G}_2 usmjereni grafovi. Definiramo **leksikografski produkt** $\mathcal{G}_1[\mathcal{G}_2]$ sa \mathcal{G}_1 u \mathcal{G}_2 kao usmjereni graf sa skupom vrhova $\mathcal{V}(\mathcal{G}_1) \times \mathcal{V}(\mathcal{G}_2)$ i skupom lukova

$$\{((x_1, x_2), (y_1, y_2)) \mid x_1 \rightarrow y_1 \vee (x_1 = y_1 \wedge x_2 \rightarrow y_2)\}.$$

Ukoliko ne želimo promatrati broj usmjerenih putova duljine dva između dva vrha usmjerenog grafa koja nisu susjedna, parametre usmjerenog kvazi-jako regularnog grafa možemo navoditi i kao (n, k, t, a) . Jedna od konstrukcija usmjerenih kvazi-jako regularnih grafova opisana u [33] dana je sljedećim teoremom.

Teorem 1.3.7. Neka su \mathcal{G}_1 i \mathcal{G}_2 usmjereni grafovi sa n_1 i n_2 vrhova, respektivno. Tada je $\mathcal{G} = \mathcal{G}_1[\mathcal{G}_2]$ usmjereni kvazi-jako regularan graf s parametrima (n, k, t, a) ako i samo ako vrijedi sljedeće.

(i) \mathcal{G}_1 je usmjereni kvazi-jako regularan graf s parametrima (n_1, k_1, t_1, a_1) i \mathcal{G}_2 je $\overline{K_{n_2}}$, gdje je

$$n = n_1 n_2, k = k_1 n_2, t = t_1 n_2, a = a_1 n_2.$$

(ii) \mathcal{G}_1 je usmjereni kvazi-jako regularan graf s parametrima (n_1, k_1, t_1, a_1) i \mathcal{G}_2 je usmjereni kvazi-jako regularan graf s parametrima (n_2, k_2, t_2, a_2) , gdje je

$$t_1 = a_1 + 1, n_2 = 2k_2 - a_2,$$

$$n = n_1 n_2, k = k_1 n_2 + k_2, t = t_1 n_2 + t_2, a = a_1 n_2 + 2k_2.$$

1.3.1. Dizajni i usmjereni grafovi

Neka je \mathcal{G} usmjereni k -regularan graf sa skupom vrhova $\mathcal{V} = \{1, \dots, n\}$ i neka je A matrica susjedstva tog usmjerenog grafa.

Matrica susjedstva A usmjerenog grafa \mathcal{G} je matrica incidencije 1- (v, k, k) dizajna \mathcal{D} kojem je skup točaka \mathcal{P} jednak skupu vrhova \mathcal{V} usmjerenog grafa \mathcal{G} , a skup blokova \mathcal{B} je skup svih skupova izlaznih susjeda vrhova usmjerenog grafa \mathcal{G} .

Napomena 1.3.1. Ako je matrica A matrica susjedstva neusmjerenog grafa, tada je A simetrična matrica incidencije 1-dizajna \mathcal{D} . Ako je A matrica susjedstva usmjerenog grafa, onda je A nesimetrična matrica.

Primjer 1.3.6. Matrica susjedstva A usmjerenog jako regularnog grafa s parametrima $(6, 2, 0, 1, 1)$ iz primjera 1.3.2 je matrica incidencije 1- $(6, 2, 2)$ dizajna kojem je:

- skup točaka $\mathcal{P} = \{1, 2, 3, 4, 5, 6\}$,
- skup blokova $\mathcal{B} = \{\{2, 3\}, \{1, 6\}, \{4, 5\}, \{2, 3\}, \{1, 6\}, \{4, 5\}\}$.

Primijetimo da ovaj 1-dizajn sadrži ponavljajuće blokove.

Neka je G grupa automorfizama 1-dizajna \mathcal{D} koja djeluje tranzitivno na skup flagova od \mathcal{D} . Matrica incidencije od \mathcal{D} je ujedno i matrica susjedstva A usmjerenog grafa \mathcal{G} , a G je također grupa automorfizama usmjerenog grafa \mathcal{G} koja djeluje luk-tranzitivno na \mathcal{G} .

1.4. ASOCIJACIJSKE SCHEME

U ovom poglavlju navest ćemo definiciju asocijacijske sheme sa d klasa te opisati vezu između asocijacijskih shema i usmjerenih regularnih grafova. Za daljnje informacije o asocijacijskim shemama upućujemo čitatelja na [11], gdje autori promatraju isključivo simetrične asocijacijske sheme, kao i na [3].

Definicija 1.4.1. Neka je X konačan skup i neka je R_0, R_1, \dots, R_d particija od $X \times X$.

$\Omega = (X, \{R_0, R_1, \dots, R_d\})$ zovemo **asocijacijska shema sa d klasa** ako vrijede sljedeći uvjeti:

(i) $R_0 = \{(x, x) | x \in X\}$,

(ii) za svaki $i \in \{0, 1, \dots, d\}$, postoji $i' \in \{0, 1, \dots, d\}$ takav da je

$$R_{i'} = \{(x, y) | (y, x) \in R_i\};$$

(iii) za sve $i, j, k \in \{0, 1, \dots, d\}$ i svaki par $(x, y) \in R_k$, broj

$$p_{ij}^k = |\{z \in X | (x, z) \in R_i \text{ i } (z, y) \in R_j\}|$$

ovisi samo o izboru i, j, k .

Za asocijacijsku shemu kažemo da je **simetrična** ako vrijedi:

$$(x, y) \in R_i \Rightarrow (y, x) \in R_i, \text{ za svaki } i \in \{0, 1, \dots, d\}.$$

Neka grupa G djeluje tranzitivno na konačan skup Ω . Proširujemo to djelovanje na skup $\Omega \times \Omega$ na sljedeći način:

$$g \cdot (x_1, x_2) = (g \cdot x_1, g \cdot x_2), \quad g \in G, (x_1, x_2) \in \Omega \times \Omega.$$

Neka su $D_0 = D, D_1, \dots, D_{r-1}$ orbite za to djelovanje, odnosno orbite za djelovanje grupe G na skup Ω . Neka je $(x, y) \in D_k$ proizvoljan. Znamo da je:

$$|D_k| = \frac{|G|}{|G_{(x,y)}|} = \frac{|G|}{|G_x \cap G_y|} = \frac{|G|}{|G_{xy}|}.$$

- Za fiksni x , postoji $z \in \Omega$ takav da je $(x, z) \in D_i$. Dakle, z je element neke orbite O_x za djelovanje G_x .
- Za fiksni y , postoji $z \in \Omega$ takav da je $(z, y) \in D_j$. Dakle, z je element neke orbite O_y za djelovanje G_y .

Slijedi da je za proizvoljan $(x, y) \in D_k$ broj elemenata $z \in \Omega$ za koje je $(x, z) \in D_i$ i $(z, y) \in D_j$ jednak:

$$p_{ij}^k = |O_x \cap O_y|. \tag{1.3}$$

Pokažimo da orbite za djelovanje grupe G čine asocijacijsku shemu.

(i) Dijagonala grupe G za djelovanje na skup Ω je skup

$$D_0 = \{(x, x) | x \in \Omega\}.$$

(ii) Neka je $(x, y) \in D_i$ i $(y, x) \in D_i'$. Za svaki $(x', y') \in D_i$ postoji $g \in G$ takav da je $(x', y') = g.(x, y)$, odnosno $x' = g.x$ i $y' = g.y$. Slijedi da je $(y', x') = g.(y, x) \in D_i'$.

(iii) Neka je $(x, y) \in D_k$ i $A_{xy} = \{z \in \Omega | (x, z) \in D_i \text{ i } (z, y) \in D_j\}$. Za $(x', y') \in D_k$ postoji $g \in G$ takav da je $(x', y') = g.(x, y)$ i $A_{x'y'} = \{z \in \Omega | (x', z) \in D_i \text{ i } (z, y') \in D_j\}$. Neka je $z \in A_{xy}$. Tada je:

- $(x, z) \in D_i \Rightarrow g.(x, z) \in D_i \Rightarrow (x', g.z) \in D_i,$
- $(z, y) \in D_j \Rightarrow g.(z, y) \in D_j \Rightarrow (g.z, y') \in D_j.$

Dakle, $g.z \in A_{x'y'}$, odnosno $|A_{xy}| \leq |A_{x'y'}|$.

Obrnuto, neka je $z' \in A_{x'y'}$. Tada je:

- $(x', z') \in D_i \Rightarrow g^{-1}.(x', z') \in D_i,$
- $(z', y') \in D_j \Rightarrow g^{-1}.(z', y') \in D_j.$

Slijedi da je $(x, z) \in D_i$ i $(z, y) \in D_j$, odnosno $z = g^{-1}.z' \in A_{xy}$. Dakle, $|A_{x'y'}| \leq |A_{xy}|$.

Pokazali smo da je $|A_{xy}| = |A_{x'y'}|$ pa broj elemenata u tim skupovima ne ovisi o odabiru para iz D_k , odnosno broj p_{ij}^k ovisi samo o izboru i, j, k .

Konstrukcija grafova iz orbitala

Konstrukcija grafova iz orbitala opisana je u [8]. Neka grupa G djeluje tranzitivno ranga r na skup Ω i neka su D_1, \dots, D_{r-1} orbitale za djelovanje grupe G različite od dijagonale. Možemo konstruirati grafove na sljedeći način.

Uzmemo li orbitalu koja nije samosparena, tada je ona skup lukova usmjerenog regularnog grafa na $|\Omega|$ vrhova. Proizvoljna samosparena orbitala je skup bridova (neusmjerenog) regularnog grafa na $|\Omega|$ vrhova. Grupa G je grupa automorfizama konstruiranog grafa koja djeluje tranzitivno na skup vrhova i skup bridova grafa.

Uzmemo li proizvoljnu uniju orbitala koje nisu samosparene ili uniju samosparenih orbitala i orbitala koje nisu samosparene, pod uvjetom da dvije odabrane orbitale nisu međusobno uparene, ta će unija biti skup lukova usmjerenog regularnog grafa na $|\Omega|$ vrhova. Proizvoljna unija samosparenih orbitala ili međusobno uparenih orbitala je skup bridova (neusmjerenog) regularnog grafa na $|\Omega|$ vrhova. Grupa G je grupa automorfizama konstruiranog grafa koja djeluje tranzitivno na skup vrhova grafa i netranzitivno na skup bridova grafa, odnosno lukova usmjerenog grafa.

Posebno, za grupe ranga tri vrijede sljedeći teoremi.

Teorem 1.4.1. Neka grupa G djeluje tranzitivno ranga tri na skup Ω i neka su D_1 i D_2 orbitale za djelovanje grupe G različite od dijagonale. Ako su orbitale D_1 i D_2 međusobno uparene, tada je svaka od njih skup lukova dvostruko regularnih turnira $\mathcal{G}_1 = (\Omega, D_1)$ i $\mathcal{G}_2 = (\Omega, D_2)$, te za njihove matrice susjedstva vrijedi $A_1^T = A_2, A_2^T = A_1$.

Teorem 1.4.2. Neka grupa G djeluje tranzitivno ranga tri na skup Ω i neka su D_1 i D_2 samosparene orbitale za djelovanje grupe G različite od dijagonale. Tada su grafovi $\mathcal{G}_1 = (\Omega, D_1)$ i $\mathcal{G}_2 = (\Omega, D_2)$ jako regularni grafovi i oni su međusobno komplementarni.

Konstrukcija usmjerenih kvazi-jako regularnih grafova iz asocijacijskih shema

U članku [33] autori su naveli konstrukciju usmjerenih kvazi-jako regularnih grafova iz asocijacijskih shema. Dokaz sljedećeg teorema može se pronaći u [33].

Teorem 1.4.3. Neka je $(X, \{R_0, R_1, \dots, R_d\})$ asocijacijska shema sa d klasa i neka je \mathcal{G}_i digraf sa skupom vrhova X i skupom lukova R_i , gdje je $i \in \{1, 2, \dots, d\}$. Tada je svaki \mathcal{G}_i usmjereni kvazi-jako regularan graf. Nadalje, stupanj od \mathcal{G}_i je p ako i samo ako p_{ii^j} poprima p različitih vrijednosti za $j \in \{1, 2, \dots, d\} \setminus \{i\}$.

U sljedećem primjeru ćemo opisati konstrukciju usmjerenog kvazi-jako regularnog grafa iz tranzitivne permutacijske grupe \mathbb{Z}_6 .

Primjer 1.4.1. Grupa $\mathbb{Z}_6 \cong \langle (1, 2, 3, 4, 5, 6) \rangle$ djeluje tranzitivno na skup $\Omega = \{1, \dots, 6\}$. Orbitale za djelovanje grupe \mathbb{Z}_6 na skup $\Omega \times \Omega$ su:

$$\begin{aligned} D &= \{(1, 1), (2, 2), (3, 3), (4, 4), (5, 5), (6, 6)\} \\ D_1 &= \{(3, 1), (5, 3), (1, 5), (6, 4), (4, 2), (2, 6)\} \\ D_2 &= \{(4, 6), (6, 2), (3, 5), (1, 3), (5, 1), (2, 4)\} \\ D_3 &= \{(2, 3), (5, 6), (1, 2), (6, 1), (4, 5), (3, 4)\} \\ D_4 &= \{(1, 4), (3, 6), (6, 3), (5, 2), (4, 1), (2, 5)\} \\ D_5 &= \{(4, 3), (5, 4), (3, 2), (2, 1), (6, 5), (1, 6)\} \end{aligned}$$

Na primjer, orbitala D_5 je skup lukova usmjerenog kvazi-jako regularnog grafa $\mathcal{G}_5 = (\Omega, D_5)$. Odredimo parametre tog digrafa.

$$p^k_{55} = |\{z \in \Omega \mid (x, z) \in D_5 \text{ i } (z, y) \in D_5\}|$$

- $k = 0$: $p^0_{55} = 0 \Rightarrow t = 0$
- $k = 1$: $p^1_{55} = 1$
- $k = 2$: $p^2_{55} = 0$
- $k = 3$: $p^3_{55} = 0$

- $k = 4$: $p^4_{55} = 0 \Rightarrow c_1 = 0, c_2 = 1$
- $k = 5$: $p^5_{55} = 0 \Rightarrow a = 0$

$\mathcal{G}_5 = (\Omega, D_5)$ je usmjereni kvazi-jako regularan graf razreda 2 s parametrima $(6, 1, 0, 0; 1, 0)$.

Teorem 1.4.3 možemo izreći i na sljedeći način.

Teorem 1.4.4. Neka je G grupa koja djeluje tranzitivno na konačan skup Ω u r orbitala $D_0 = D, D_1, \dots, D_{r-1}$ i neka je \mathcal{G}_i digraf čiji je skup vrhova Ω i skup lukova D_i , za $i \in \{1, \dots, r-1\}$. Tada je svaki \mathcal{G}_i usmjereni kvazi-jako regularan graf. Nadalje, \mathcal{G}_i je razreda p ako i samo ako p^j_{ii} poprima p različitih vrijednosti za $j \in \{1, \dots, r-1\} \setminus \{i\}$.

1.5. OSNOVNI POJMOVI TEORIJE KODIRANJA

Teorija kodiranja je grana diskretne matematike koja se bavi učinkovitim i pouzdanim prijenosom podataka od pošiljatelja do primatelja kroz komunikacijski kanal, kao i ispravljanjem grešaka koje nastaju tijekom prijenosa. C. E. Shannon je 1948. godine objavio rad *A mathematical theory of communication* ([52]), koji je označio početak teorije informacija i teorije kodiranja. Osim njegovog rada, najraniji radovi vezani za teoriju kodiranja su radovi Golaya ([30]) i Hamminga ([35]). Cilj pri konstrukciji kodova je dobiti kodove s malom duljinom, velikom dimenzijom i velikom minimalnom udaljenosti, kako bi prijenos podataka bio brz, broj mogućih poruka velik, a kapacitet za ispravljanje pogrešaka, koji ovisi o minimalnoj udaljenosti, što veći.

Linearni kodovi, zbog svojih algebarskih svojstava, su najviše proučavani kodovi u matematici. U ovom ćemo se radu baviti samo linearnim kodovima, a od posebne važnosti bit će samoortogonalni i LCD kodovi. U zadnjem poglavlju opisat ćemo konstrukciju kodova iz matrica susjedstva usmjerenih regularnih grafova s određenim parametrima.

Definicija 1.5.1. Kod \mathcal{C} duljine n nad alfabetom F je podskup $\mathcal{C} \subseteq F^n$. Skup F^n zovemo **prostorom koda**, a $|\mathcal{C}|$ je veličina koda. Elemente skupa \mathcal{C} zovemo **riječima** koda.

Kod nad alfabetom \mathbb{F}_2 zovemo **binarnim kodom**.

Definicija 1.5.2. Neka su $\mathbf{x} = (x_1, \dots, x_n)$ i $\mathbf{y} = (y_1, \dots, y_n)$ riječi koda $\mathcal{C} \subseteq F^n$. Broj

$$d_H(\mathbf{x}, \mathbf{y}) = \left| \{i \mid x_i \neq y_i, i \in \{1, \dots, n\}\} \right|$$

zovemo **Hammingovom udaljenosti** riječi \mathbf{x} i \mathbf{y} .

Definicija 1.5.3. Najmanja udaljenost koda \mathcal{C} , u oznaci $d_{min}(\mathcal{C})$, je broj

$$d_{min}(\mathcal{C}) = \min\{d_H(\mathbf{x}, \mathbf{y}) \mid \mathbf{x}, \mathbf{y} \in \mathcal{C}, \mathbf{x} \neq \mathbf{y}\}.$$

Definicija 1.5.4. Neka je \mathbf{x} riječ koda $\mathcal{C} \subseteq F^n$. **Težina riječi \mathbf{x}** je broj

$$w(\mathbf{x}) = d_H(\mathbf{x}, \mathbf{0}),$$

gdje je $\mathbf{0} = (0, \dots, 0) \in F^n$.

Definicija 1.5.5. Dva koda \mathcal{C}_1 i \mathcal{C}_2 duljine n nad istim alfabetom su **izomorfna** ako postoji permutacija f skupa $\{1, \dots, n\}$ takva da za svaku riječ $\mathbf{x} = (x_1, \dots, x_n) \in \mathcal{C}_1$ postoji riječ $\mathbf{y} = (y_1, \dots, y_n) \in \mathcal{C}_2$ takva da je $\mathbf{y} = (x_{f(1)}, \dots, x_{f(n)})$ i obratno.

Definicija 1.5.6. Neka je q potencija prostog broja i neka je \mathbb{F}_q konačno polje reda q . Neka je \mathbb{F}_q^n vektorski prostor dimenzije n nad poljem \mathbb{F}_q . **Linearan kod** \mathcal{C} duljine n i dimenzije k nad poljem \mathbb{F}_q je k -dimenzionalan vektorski potprostor prostora \mathbb{F}_q^n . Parametre linearnog koda \mathcal{C} označavamo sa $[n, k]_q$.

Ako je najmanja udaljenost koda \mathcal{C} jednaka d , parametre linearnog koda \mathcal{C} označavamo sa $[n, k, d]_q$.

Dokazi sljedećih propozicija mogu se pronaći u [43].

Propozicija 1.5.1. Minimalna udaljenost linearnog koda \mathcal{C} jednaka je

$$d = \min\{w_H(\mathbf{x}) \mid \mathbf{x} \in \mathcal{C}, \mathbf{x} \neq \mathbf{0}\}.$$

Propozicija 1.5.2. Kod \mathcal{C} s minimalnom udaljenosti d može detektirati najviše $d - 1$ pogrešaka koje se dogode prilikom prijenosa jedne riječi koda.

Propozicija 1.5.3. Linearan $[n, k, d]$ kod \mathcal{C} može ispraviti najviše

$$t = \left\lfloor \frac{d-1}{2} \right\rfloor$$

pogrešaka u jednoj riječi koda.

Linearan $[n, k, d]$ kod je **optimalan** ako za dane n, k ne postoji kod iste duljine i veće minimalne udaljenosti. Linearan $[n, k, d]$ kod je **skoro optimalan** ako je njegova minimalna udaljenost za 1 manja od minimalne udaljenosti optimalnog koda s istim n i k .

Informacije o parametrima linearnih kodova dane su na internetskoj stranici <https://mint.sbg.ac.at/> ([46]).

Definicija 1.5.7. Dva linearna koda nad istim poljem su **ekvivalentna** ako se jedan može dobiti iz drugog permutacijom koordinata u svim riječima koda i množenjem pojedine koordinate u svim riječima koda nekim nenul elementom polja.

Definicija 1.5.8. **Automorfizam** koda \mathcal{C} je izomorfizam sa \mathcal{C} u \mathcal{C} , tj. permutacija koordinatnih pozicija koja preslikava riječ koda u riječ koda. Skup svih automorfizama linearnog koda \mathcal{C} čini grupu koju nazivamo **puna grupa automorfizama** koda \mathcal{C} i označavamo $\text{Aut}(\mathcal{C})$.

Linearan kod možemo zadati i njegovom generirajućom matricom.

Definicija 1.5.9. **Generirajuća matrica** linearnog $[n, k]_q$ koda \mathcal{C} je $k \times n$ matrica čiji su retci vektori baze koda \mathcal{C} .

Kažemo da je generirajuća matrica linearnog $[n, k]_q$ koda u standardnom obliku, ako je ona oblika $[I_k, A]$, gdje je I_k jedinična matrica reda k .

Definicija 1.5.10. Neka je \mathcal{C} linearan kod nad konačnim poljem \mathbb{F}_q . **Dualni kod** koda \mathcal{C} , u oznaci \mathcal{C}^\perp , je kod

$$\mathcal{C}^\perp = \{x \in \mathbb{F}_q^n \mid x \cdot c = 0, \forall c \in \mathcal{C}\},$$

gdje je sa $x \cdot c$ označen standardni skalarni produkt vektora x i c .

Definicija 1.5.11. Linearan kod \mathcal{C} je

- **samoortogonalan** ako je $\mathcal{C} \subseteq \mathcal{C}^\perp$,

- **samodualan** ako je $\mathcal{C} = \mathcal{C}^\perp$,
- **LCD** (eng. *linear code with complementary dual*) ako je $\mathcal{C} \cap \mathcal{C}^\perp = \{\mathbf{0}\}$.

Za daljnje proučavanje LCD kodova, čitatelja upućujemo na [44].

Napomena 1.5.1. Ako je \mathcal{C} samoortogonalan kod, tada je $\dim(\mathcal{C}) \leq \frac{n}{2}$. Ako je \mathcal{C} samodualan kod duljine n nad konačnim poljem \mathbb{F}_q , tada je n paran i

$$\dim(\mathcal{C}) = \frac{n}{2}.$$

Iz prethodne napomene slijedi propozicija 1.5.4, čiji se dokaz može pronaći u [43].

Propozicija 1.5.4. Neka je \mathcal{C} linearan $[n, k, d]_q$ kod čija je generirajuća matrica G .

1. \mathcal{C} je samoortogonalan kod ako i samo ako je $G \cdot G^T = \mathbf{0}$.
2. \mathcal{C} je samodualan kod ako i samo ako je $G \cdot G^T = \mathbf{0}$ i $\dim(\mathcal{C}) = \frac{n}{2}$.

2. KONSTRUKCIJE

U ovom poglavlju bavimo se konstrukcijama usmjerenih regularnih grafova. Proučavamo svojstva komplementa usmjerenog kvazi-jako regularnog grafa te uvodimo i dokazujemo neke konstrukcije usmjerenih kvazi-jako regularnih grafova iz matrica susjedstva postojećih. Također, uvodimo i dokazujemo metodu konstrukcije usmjerenih regularnih grafova iz tranzitivnih permutacijskih grupa, te opisujemo metodu konstrukcije usmjerenih regularnih grafova iz netranzitivnih permutacijskih grupa.

2.1. KOMPLEMENT USMJERENOG KVAZI-JAKO REGULARNOG GRAFA

Komplement usmjerenog kvazi-jako regularnog grafa će imati neka zanimljiva svojstva, iako sam nije usmjereni kvazi-jako regularan graf. Kao posljedica teorema 2.1.1 kojeg ćemo dokazati zaključujemo sljedeće.

Komplement usmjerenog kvazi-jako regularnog grafa s parametrima $(n, k, t, a; c_1, \dots, c_p)$ je usmjereni k' -regularan graf sa n vrhova takav da:

- (i) svaki vrh je incidentan sa t' neusmjerenih bridova,
- (ii) postoji broj a' takav da za svaka dva različita vrha x i y koja nisu susjedna broj putova duljine 2 od x do y je a' ,
- (iii) postoje brojevi b_i takvi da za svaka dva susjedna vrha x i y broj putova duljine 2 od x do y je b_i , gdje je $1 \leq i \leq p$,
- (iv) za svaki $1 \leq i \leq p$ postoje različiti susjedni vrhovi x i y takvi da je broj putova duljine 2 od x do y jednak b_i .

Usmjereni graf s takvim svojstvima označavat ćemo sa $\text{QSRD}^C(n, k', t', a'; b_1, \dots, b_p)$.

Nenegativan cijeli broj p zovemo razredom tog digrafa. Bez smanjenja općenitosti u nastavku pretpostavljamo da je $k > 0$ i $b_1 > b_2 > \dots > b_p$.

Za $t = k$ dobivamo neusmjereni graf.

Za usmjerene kvazi-jako regularne grafove vrijedi i sljedeća lema.

Lema 2.1.1. Usmjereni ciklus duljine n , $n \geq 4$, je usmjereni kvazi-jako regularan graf s parametrima $(n, 1, 0, 0; 1, 0)$.

Dokaz. Neka je \mathcal{G} usmjereni ciklus duljine n , $n \geq 4$, $n \in \mathbb{N}$. Tada je \mathcal{G} 1-regularan usmjereni graf; ulazni i izlazni stupanj svakog vrha je točno 1.

Usmjereni ciklus ne sadrži neusmjerene bridove pa je $t = 0$. Između svaka dva susjedna vrha x i y postoji samo put duljine 1 ili put duljine veće od n pa slijedi da je broj putova duljine dva između tih vrhova $a = 0$. S druge strane, za svaka dva nesusjedna vrha x i y :

- (1.) ili postoji vrh z takav da je $x \rightarrow z \rightarrow y$ pa je to ujedno i jedini put duljine 2 između x i y ;
- (2.) ili postoje vrhovi z_1, z_2, \dots, z_t , $t \in \{2, \dots, n-2\}$, što znači da nema putova duljine 2 između x i y .

Dakle, \mathcal{G} je usmjereni kvazi-jako regularan graf razreda 2, gdje je $c_1 = 1$, $c_2 = 0$. ■

Primjer 2.1.1. Usmjereni ciklus duljine četiri je usmjereni kvazi-jako regularan graf s parametrima $(4, 1, 0, 0; 1, 0)$ i matricom susjedstva

$$A = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \end{bmatrix}.$$

Komplement tog usmjerenog grafa ima parametre $\text{QSRD}^C(4, 2, 1, 2; 1, 0)$ i njegova matrica susjedstva je

$$A' = J - I - A = \begin{bmatrix} 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 \end{bmatrix}.$$

Teorem 2.1.1. Ako je \mathcal{G} usmjereni kvazi-jako regularan graf s parametrima $(n, k, t, a; c_1, \dots, c_p)$ i matricom susjedstva A , onda je komplementaran graf \mathcal{G}' s matricom susjedstva $A' = J - I - A$ usmjereni graf s parametrima $\text{QSRD}^C(n, k', t', a'; b_1, \dots, b_p)$ i vrijedi

$$\begin{aligned} A'J &= JA' = (n - k - 1)J, \\ (A')^2 &= t'I + A'(J - I - A') + b_1C_1 + \dots + b_pC_p, \end{aligned}$$

gdje je $C_1 + \dots + C_p = J - I - A = A'$ i parametri su

$$k' = (n - 2k) + (k - 1),$$

$$t' = (n - 2k) + (t - 1),$$

$$A' = (n - 2k) + a,$$

$$b_1 = (n - 2k) + (c_1 - 2),$$

$$b_2 = (n - 2k) + (c_2 - 2),$$

$$\vdots$$

$$b_p = (n - 2k) + (c_p - 2).$$

Dokaz. Matrica susjedstva A usmjerenog kvazi-jako regularnog grafa s parametrima $(n, k, t, a; c_1, \dots, c_p)$ zadovoljava:

$$AJ = JA = kJ, \quad (2.1)$$

$$A^2 = tI + aA + c_1C_1 + \dots + c_pC_p, \quad (2.2)$$

gdje je $C_1 + \dots + C_p = J - I - A$. Matrica susjedstva komplementa tog usmjerenog grafa je $A' = J - I - A$.

Iz (2.1) slijedi:

$$\begin{aligned} A'J &= (J - I - A)J \\ &= J^2 - I \cdot J - A \cdot J \\ &= nJ - J - kJ \\ &= (n - k - 1)J \end{aligned}$$

i

$$\begin{aligned} JA' &= J(J - I - A) \\ &= J^2 - J \cdot I - J \cdot A \\ &= nJ - J - kJ \\ &= (n - k - 1)J, \end{aligned}$$

odnosno vrijedi $A'J = JA' = (n - k - 1)J$.

Iz (2.2) slijedi

$$\begin{aligned}
(A')^2 &= (J - I - A)^2 \\
&= (J - I - A)(J - I - A) \\
&= J^2 - JI - JA - IJ + I + IA - AJ + AI + A^2 \\
&= nJ - 2J - 2kJ + I + 2A + A^2 \\
&= (n - 2k - 2)J + (t + 1)I + (2 + a)A + c_1C_1 + \dots + c_pC_p \\
&= (n - 2k - 2)J + (n - 2k - 2 + t + 1)I + (n - 2k - 2 + 2 + a)A - (n - 2k - 2)I - \\
&\quad - (n - 2k - 2)A + c_1C_1 + \dots + c_pC_p \\
&= (n - 2k + t - 1)I + (n - 2k + a)A + (n - 2k - 2)(J - I - A) + c_1C_1 + \dots + c_pC_p \\
&= (n - 2k + t - 1)I + (n - 2k + a)(J - I - A') + (n - 2k - 2)(C_1 + \dots + C_p) + \\
&\quad + c_1C_1 + \dots + c_pC_p \\
&= (n - 2k + k - 1)I + (n - 2k + a)(J - I - A') + (n - 2k - 2 + c_1)C_1 + \dots + \\
&\quad + (n - 2k - 2 + c_p)C_p,
\end{aligned}$$

gdje je $C_1 + \dots + C_p = J - I - A = A'$. ■

Primijetimo: $C_1 + \dots + C_p = J - I - A = A'$ pa su koeficijenti b_1, \dots, b_p brojevi usmjerenih putova duljine 2 između sva susjedna vrha u usmjerenom grafu \mathcal{G}' ; parametar A' množi matricu $A = J - I - A'$, pa je A' broj usmjerenih putova duljine 2 između dva različita nesusedna vrha.

Primjer 2.1.2. Komplement usmjerenog kvazi-jako regularnog grafa s parametrima $(6, 2, 0, 0; 2, 0)$ iz primjera 1.3.5 ima parametre $\text{QSRD}^C(n, k', t', A'; b_1, b_2) = \text{QSRD}^C(6, 3, 2, 1; 2, 0)$, a njegova matrica susjedstva je

$$A' = J - I - A = \begin{bmatrix} 0 & 1 & 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 1 & 0 & 1 \\ 0 & 1 & 0 & 1 & 0 & 1 \\ 1 & 0 & 0 & 0 & 1 & 1 \\ 1 & 1 & 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 1 & 1 & 0 \end{bmatrix},$$

gdje je A matrica susjedstva usmjerenog kvazi-jako regularnog grafa iz primjera 1.3.5.

2.2. NEKE KONSTRUKCIJE USMJERENIH KVAZI-JAKO REGULARNIH GRAFOVA

Transponirana matrica matrice susjedstva usmjerenog kvazi-jako regularnog grafa također je matrica susjedstva usmjerenog kvazi-jako regularnog grafa s istim parametrima. Dokazujemo sljedeći teorem.

Teorem 2.2.1. Neka je \mathcal{G} usmjereni kvazi-jako regularan graf i neka je $A = A(\mathcal{G})$ njegova matrica susjedstva. Neka je \mathcal{G}^T usmjereni graf takav da je $A(\mathcal{G}^T) = A^T$. Tada je \mathcal{G}^T također usmjereni kvazi-jako regularan graf s istim parametrima kao \mathcal{G} .

Dokaz. Neka je A matrica susjedstva usmjerenog kvazi-jako regularnog grafa \mathcal{G} .

Za matricu A vrijedi:

$$AJ = JA = kJ,$$

pa slijedi

$$(AJ)^T = (JA)^T = (kJ)^T$$

$$J^T A^T = A^T J^T = kJ^T$$

$$A^T J = JA^T = kJ.$$

Dalje, vrijedi

$$A^2 = tI + aA + c_1 C_1 + c_2 C_2 + \cdots + c_p C_p$$

i

$$C_1 + \cdots + C_p = J - I - A$$

pa slijedi

$$(A^2)^T = (tI + aA + c_1 C_1 + \cdots + c_p C_p)^T$$

$$(A \cdot A)^T = (tI)^T + (aA)^T + (c_1 C_1)^T + \cdots + (c_p C_p)^T$$

$$A^T \cdot A^T = tI + aA^T + c_1 C_1^T + \cdots + c_p C_p^T$$

$$(A^T)^2 = tI + aA^T + c_1 C_1^T + \cdots + c_p C_p^T,$$

gdje je

$$C_1^T + \cdots + C_p^T = J - I - A^T.$$

■

Primjer 2.2.1. Neka je \mathcal{G} usmjereni kvazi-jako regularan graf s parametrima $(6, 1, 0, 0; 1, 0)$ i matricom susjedstva

$$A(\mathcal{G}) = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \end{bmatrix}.$$

Njegova puna grupa automorfizama je \mathbb{Z}_6 . Transponirana matrica

$$A^T = A(\mathcal{G}^T) = \begin{bmatrix} 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

je matrica susjedstva usmjerenog kvazi-jako regularnog grafa s istim parametrima. Oba digrafa su usmjereni ciklusi duljine 6 pa su izomorfni.

Autori su u radu [33] konstruirali usmjerene kvazi-jako regularne grafove koristeći leksikografski produkt i direktni produkt usmjerenih grafova. U nastavku opisujemo i dokazujemo konstrukciju usmjerenih kvazi-jako regularnih grafova razreda p iz poznatih matrica susjedstva već konstruiranih usmjerenih kvazi-jako regularnih grafova, koja je temeljena na konstrukciji usmjerenih kvazi-jako regularnih grafova iz leksikografskog produkta usmjerenih grafova, opisanoj u [33]. Teorem u nastavku omogućuje konstrukciju familija usmjerenih kvazi-jako regularnih grafova.

Teorem 2.2.2. Neka je \mathcal{G} usmjereni kvazi-jako regularan graf s parametrima $(n, k, t, a; c_1, c_2, \dots, c_p)$ i neka je A matrica susjedstva od \mathcal{G} . Neka je \mathcal{G}' graf s matricom susjedstva

$$B = A(\mathcal{G}') = \begin{bmatrix} A & \cdots & A \\ \vdots & & \vdots \\ A & \cdots & A \end{bmatrix}_{mn}, \text{ za neki } m \in \mathbb{N}.$$

1. Ako je $t = c_i$, za neki $i \in \{1, \dots, p\}$, onda je graf \mathcal{G}' usmjereni kvazi-jako regularan graf s parametrima $(mn, mk, mt, ma; mc_1, mc_2, \dots, mc_p)$.
2. Ako je $t \neq c_i$, za svaki $i \in \{1, \dots, p\}$, onda je graf \mathcal{G}' usmjereni kvazi-jako regularan graf s parametrima $(mn, mk, mt, ma; mc_1, mc_2, \dots, mc_p, mt)$.

Dokaz. Za matricu susjedstva A usmjerenog grafa \mathcal{G} vrijedi:

$$\begin{aligned} AJ_n &= J_n A = kJ_n, \\ A^2 &= tI_n + aA + c_1C_1 + \cdots + c_pC_p, \end{aligned}$$

gdje je $C_1 + \dots + C_p = J_n - I_n - A$.

Pitamo se vrijedi li:

$$BJ_{mn} = J_{mn}B = mkJ_{mn},$$

te postoje li matrice $C_1', \dots, C_{p'}'$ takve da je

$$B^2 = mtI_{mn} + maB + mc_1C_1' + \dots + mc_{p'}C_{p'}',$$

i

$$C_1' + \dots + C_{p'}' = J_{mn} - I_{mn} - B.$$

Iz $AJ_n = J_nA = kJ_n$ slijedi

$$\begin{aligned} BJ_{mn} &= \begin{bmatrix} A & \cdots & A \\ \vdots & & \vdots \\ A & \cdots & A \end{bmatrix} \cdot \begin{bmatrix} J_n & \cdots & J_n \\ \vdots & & \vdots \\ J_n & \cdots & J_n \end{bmatrix} \\ &= \begin{bmatrix} mAJ_n & \cdots & mAJ_n \\ \vdots & & \vdots \\ mAJ_n & \cdots & mAJ_n \end{bmatrix} \\ &= \begin{bmatrix} mkJ_n & \cdots & mkJ_n \\ \vdots & & \vdots \\ mkJ_n & \cdots & mkJ_n \end{bmatrix} \\ &= mkJ_{mn} \end{aligned}$$

i

$$\begin{aligned} J_{mn}B &= J_{mn} \cdot \begin{bmatrix} A & \cdots & A \\ \vdots & & \vdots \\ A & \cdots & A \end{bmatrix} \\ &= \begin{bmatrix} J_n & \cdots & J_n \\ \vdots & & \vdots \\ J_n & \cdots & J_n \end{bmatrix} \cdot \begin{bmatrix} A & \cdots & A \\ \vdots & & \vdots \\ A & \cdots & A \end{bmatrix} \\ &= \begin{bmatrix} mJ_nA & \cdots & mJ_nA \\ \vdots & & \vdots \\ mJ_nA & \cdots & mJ_nA \end{bmatrix} \\ &= \begin{bmatrix} mkJ_n & \cdots & mkJ_n \\ \vdots & & \vdots \\ mkJ_n & \cdots & mkJ_n \end{bmatrix} \\ &= mkJ_{mn} \end{aligned}$$

pa vrijedi $BJ_{mn} = J_{mn}B = mkJ_{mn}$.

Iz $A^2 = tI_n + aA + c_1C_1 + \dots + c_pC_p$ slijedi

$$\begin{aligned}
B^2 &= \begin{bmatrix} A & \dots & A \\ \vdots & & \vdots \\ A & \dots & A \end{bmatrix} \cdot \begin{bmatrix} A & \dots & A \\ \vdots & & \vdots \\ A & \dots & A \end{bmatrix} \\
&= m \cdot \begin{bmatrix} A^2 & \dots & A^2 \\ \vdots & & \vdots \\ A^2 & \dots & A^2 \end{bmatrix} \\
&= m \cdot \begin{bmatrix} tI_n + aA + c_1C_1 + \dots + c_pC_p & \dots & tI_n + aA + c_1C_1 + \dots + c_pC_p \\ & & \vdots \\ tI_n + aA + c_1C_1 + \dots + c_pC_p & \dots & tI_n + aA + c_1C_1 + \dots + c_pC_p \end{bmatrix} \\
&= mt \begin{bmatrix} I_n & \dots & I_n \\ \vdots & & \vdots \\ I_n & \dots & I_n \end{bmatrix} + ma \begin{bmatrix} A & \dots & A \\ \vdots & & \vdots \\ A & \dots & A \end{bmatrix} + mc_1 \begin{bmatrix} C_1 & \dots & C_1 \\ \vdots & & \vdots \\ C_1 & \dots & C_1 \end{bmatrix} + \dots + mc_p \begin{bmatrix} C_p & \dots & C_p \\ \vdots & & \vdots \\ C_p & \dots & C_p \end{bmatrix} \\
&= mt \begin{bmatrix} I_n & \dots & 0 \\ \vdots & \ddots & \vdots \\ 0 & \dots & I_n \end{bmatrix} + maB + mc_1 \begin{bmatrix} C_1 & \dots & C_1 \\ \vdots & & \vdots \\ C_1 & \dots & C_1 \end{bmatrix} + \dots + mc_p \begin{bmatrix} C_p & \dots & C_p \\ \vdots & & \vdots \\ C_p & \dots & C_p \end{bmatrix} + mt \begin{bmatrix} 0 & \dots & I_n \\ \vdots & & \vdots \\ I_n & \dots & 0 \end{bmatrix}
\end{aligned}$$

1. Neka je $t = c_i$, za neki $i \in \{1, \dots, p\}$. Tada imamo:

$$\begin{aligned}
B^2 &= mt \begin{bmatrix} I_n & \dots & 0 \\ \vdots & \ddots & \vdots \\ 0 & \dots & I_n \end{bmatrix} + maB + mc_1 \begin{bmatrix} C_1 & \dots & C_1 \\ \vdots & & \vdots \\ C_1 & \dots & C_1 \end{bmatrix} + \dots + mc_i \begin{bmatrix} C_i & \dots & C_i + I_n \\ \vdots & & \vdots \\ C_i + I_n & \dots & C_i \end{bmatrix} + \\
&\quad + \dots + mc_p \begin{bmatrix} C_p & \dots & C_p \\ \vdots & & \vdots \\ C_p & \dots & C_p \end{bmatrix} \\
&= mtI_{mn} + maB + mc_1C_1' + \dots + mc_iC_i' + \dots + mc_pC_p',
\end{aligned}$$

gdje je

$$C_j' = \begin{bmatrix} C_j & \dots & C_j \\ \vdots & & \vdots \\ C_j & \dots & C_j \end{bmatrix}, \text{ za } j \neq i, C_i' = \begin{bmatrix} C_i & \dots & C_i + I_n \\ \vdots & & \vdots \\ C_i + I_n & \dots & C_i \end{bmatrix},$$

i

$$\begin{aligned}
C_1' + \dots + C_i' + \dots + C_p' &= \begin{bmatrix} C_1 & \dots & C_1 \\ \vdots & & \vdots \\ C_1 & \dots & C_1 \end{bmatrix} + \dots + \begin{bmatrix} C_i & \dots & C_i + I_n \\ \vdots & & \vdots \\ C_i + I_n & \dots & C_i \end{bmatrix} + \dots + \\
&+ \begin{bmatrix} C_p & \dots & C_p \\ \vdots & & \vdots \\ C_p & \dots & C_p \end{bmatrix} \\
&= \begin{bmatrix} C_1 + \dots + C_i + \dots + C_p & C_1 + \dots + C_i + I_n + \dots + C_p \\ C_1 + \dots + C_i + I_n + \dots + C_p & C_1 + \dots + C_i + \dots + C_p \end{bmatrix} \\
&= \begin{bmatrix} J_n - I_n - A & \dots & J_n - I_n - A + I_n \\ \vdots & & \vdots \\ J_n - I_n - A + I_n & \dots & J_n - I_n - A \end{bmatrix} \\
&= \begin{bmatrix} J_n & \dots & J_n \\ \vdots & & \vdots \\ J_n & \dots & J_n \end{bmatrix} - \begin{bmatrix} I_n & \dots & 0 \\ \vdots & & \vdots \\ 0 & \dots & I_n \end{bmatrix} - \begin{bmatrix} A & \dots & A \\ \vdots & & \vdots \\ A & \dots & A \end{bmatrix} \\
&= J_{mn} - I_{mn} - B.
\end{aligned}$$

2. Neka je $t \neq c_i$, za svaki $i \in \{1, \dots, p\}$. Tada imamo:

$$\begin{aligned}
B^2 &= mt \begin{bmatrix} I & \dots & 0 \\ \vdots & & \vdots \\ 0 & \dots & I \end{bmatrix} + maB + mc_1 \begin{bmatrix} C_1 & \dots & C_1 \\ \vdots & & \vdots \\ C_1 & \dots & C_1 \end{bmatrix} + \dots + mc_p \begin{bmatrix} C_p & \dots & C_p \\ \vdots & & \vdots \\ C_p & \dots & C_p \end{bmatrix} + \\
&+ mt \begin{bmatrix} 0 & \dots & I \\ \vdots & & \vdots \\ I & \dots & 0 \end{bmatrix} \\
&= mtI_{mn} + maB + mc_1C_1' + \dots + mc_pC_p' + mtC_{p+1}',
\end{aligned}$$

gdje je

$$C_1' = \begin{bmatrix} C_1 & \dots & C_1 \\ \vdots & & \vdots \\ C_1 & \dots & C_1 \end{bmatrix}, \dots, C_p' = \begin{bmatrix} C_p & \dots & C_p \\ \vdots & & \vdots \\ C_p & \dots & C_p \end{bmatrix}, C_{p+1}' = \begin{bmatrix} 0 & \dots & I \\ \vdots & & \vdots \\ I & \dots & 0 \end{bmatrix}$$

i

$$\begin{aligned}
C_1' + \dots + C_p' + C_{p+1}' &= \begin{bmatrix} C_1 & \dots & C_1 \\ \vdots & & \vdots \\ C_1 & \dots & C_1 \end{bmatrix} + \dots + \begin{bmatrix} C_p & \dots & C_p \\ \vdots & & \vdots \\ C_p & \dots & C_p \end{bmatrix} + \begin{bmatrix} 0 & \dots & I \\ \vdots & & \vdots \\ I & \dots & 0 \end{bmatrix} \\
&= \begin{bmatrix} C_1 + \dots + C_p & \dots & C_1 + \dots + C_p + I \\ \vdots & & \vdots \\ C_1 + \dots + C_p + I & \dots & C_1 + \dots + C_p \end{bmatrix} \\
&= \begin{bmatrix} J - I - A & \dots & J - I - A + I \\ \vdots & & \vdots \\ J - I - A + I & \dots & J - I - A \end{bmatrix} \\
&= \begin{bmatrix} J & \dots & J \\ \vdots & & \vdots \\ J & \dots & J \end{bmatrix} - \begin{bmatrix} I & \dots & 0 \\ \vdots & & \vdots \\ 0 & \dots & I \end{bmatrix} - \begin{bmatrix} A & \dots & A \\ \vdots & & \vdots \\ A & \dots & A \end{bmatrix} \\
&= J_{mn} - I_{mn} - B.
\end{aligned}$$

■

Primjer 2.2.2. Neka je \mathcal{G} usmjereni kvazi-jako regularan graf s parametrima $(10, 5, 2, 2; 5, 4, 2)$. Njegova matrica susjedstva je

$$A = \begin{bmatrix} 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 \\ 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 \\ 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 \\ 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 \\ 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 \end{bmatrix}.$$

Matrica susjedstva digrafa \mathcal{G}' ,

$$A(\mathcal{G}') = \begin{bmatrix} A & A \\ A & A \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 \\ 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 \\ 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 \\ 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 \\ 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 \\ 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 \\ 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 \\ 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 \\ 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 1 & 0 \end{bmatrix}$$

je matrica susjedstva usmjerenog kvazi-jako regularnog grafa s parametrima $(20, 10, 4, 4; 10, 8, 4)$.

Konstrukciju iz teorema 2.2.2 možemo primijeniti za konstrukciju usmjerenih kvazi-jako regularnih grafova način opisan u primjeru 2.2.3.

Primjer 2.2.3. Neka je $m = 2$ i neka je \mathcal{G} usmjereni kvazi-jako regularan graf s parametrima $(10,5,2,2;5,4,2)$ i matricom susjedstva kao u primjeru 2.2.2. Matrica

$$A \otimes J_2 = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 \\ 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 \\ 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 \\ 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 \\ 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 \\ 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \end{bmatrix}$$

je matrica susjedstva usmjerenog kvazi-jako regularnog grafa s parametrima $(20,10,4,4;10,8,4)$.

Napomena 2.2.1. Konstrukcija iz primjera 2.2.3 iskazana preko Kroneckerova produkta ekvivalentna je konstrukciji iz teorema 2.2.2 za $J_m \otimes A$.

Iterativnim ponavljanjem može se konstruirati familija usmjerenih kvazi-jako regularnih grafova na sljedeći način.

Neka je \mathcal{G} usmjereni kvazi-jako regularan graf s parametrima $(n, k, t, a; c_1, \dots, c_p)$ i neka je A_0 matrica susjedstva tog usmjerenog grafa. Neka je $s \in \mathbb{N}$ i neka je \mathcal{G}_s graf s matricom susjedstva

$$A_s = \begin{bmatrix} A_{s-1} & \cdots & A_{s-1} \\ \vdots & & \vdots \\ A_{s-1} & \cdots & A_{s-1} \end{bmatrix}_{mn}, \text{ za neki } m \in \mathbb{N}.$$

1. Ako je $t = c_i$, za neki $i \in \{1, \dots, p\}$, onda je A_s matrica susjedstva usmjerenog kvazi-jako regularnog grafa s parametrima $(m^s n, m^s k, m^s t, m^s a; m^s c_1, m^s c_2, \dots, m^s c_p)$.
2. Ako je $t \neq c_i$, za svaki $i \in \{1, \dots, p\}$, onda je A_s matrica susjedstva usmjerenog kvazi-jako regularnog grafa s parametrima $(m^s n, m^s k, m^s t, m^s a; m^s c_1, m^s c_2, \dots, m^s c_p, m^s t)$.

Za matricu susjedstva A_l , $l < s$, usmjerenog kvazi-jako regularnog grafa s parametrima $(m^l n, m^l k, m^l t, m^l a; m^l c_1, \dots, m^l c_p)$, iz teorema 2.2.2 slijedi da je matrica

$$A_{l+1} = \begin{bmatrix} A_l & A_l \\ A_l & A_l \end{bmatrix}$$

matrica susjedstva usmjerenog kvazi-jako regularnog grafa s parametrima

$$\begin{aligned} (m \cdot m^l n, m \cdot m^l k, m \cdot m^l t, m \cdot m^l a; m \cdot m^l c_1, \dots, m \cdot m^l c_p) = \\ = (m^{l+1} n, m^{l+1} k, m^{l+1} t, m^{l+1} a; m^{l+1} c_1, \dots, m^{l+1} c_p). \end{aligned}$$

(slučaj 1.) ili matrica susjedstva usmjerenog kvazi-jako regularnog grafa s parametrima

$$\begin{aligned} (m \cdot m^l n, m \cdot m^l k, m \cdot m^l t, m \cdot m^l a; m \cdot m^l c_1, \dots, m \cdot m^l c_p, m \cdot m^l t) = \\ = (m^{l+1} n, m^{l+1} k, m^{l+1} t, m^{l+1} a; m^{l+1} c_1, \dots, m^{l+1} c_p, m^{l+1} t). \end{aligned}$$

(slučaj 2.).

Primjer 2.2.4. Neka je $A(\mathcal{G}')$ matrica susjedstva usmjerenog kvazi-jako regularnog grafa \mathcal{G}' s parametrima $(20, 10, 4, 4; 10, 8, 4)$ iz primjera 2.2.2.

Matrica

$$A(\mathcal{G}'') = \begin{bmatrix} A(\mathcal{G}') & A(\mathcal{G}') \\ A(\mathcal{G}') & A(\mathcal{G}') \end{bmatrix}$$

je matrica susjedstva digrafa \mathcal{G}'' , koji je usmjereni kvazi-jako regularan graf s parametrima $(40, 20, 8, 8; 20, 16, 8)$. Iterativnim ponavljanjem dobivamo familiju usmjerenih kvazi-jako regularnih grafova razreda 2 s parametrima $(10 \cdot 2^s, 5 \cdot 2^s, 2 \cdot 2^s, 2 \cdot 2^s; 5 \cdot 2^s, 4 \cdot 2^s, 2 \cdot 2^s)$, za $s \in \mathbb{N}$.

Napomena 2.2.2. Za usmjereni kvazi-jako regularan graf razreda $p = 1$, koji ima parametre $(n, k, t, a; c_1)$, takav da je $t = c_1$, konstrukcija opisana teoremom 2.2.2 ekvivalentna je konstrukciji opisanoj u teoremu 1.3.6, odnosno, konstruirani usmjereni graf za te uvjete je usmjereni jako regularan graf s parametrima (n, k, a, c_1, t) .

Napomena 2.2.3. Za usmjereni kvazi-jako regularan graf \mathcal{G}_1 s parametrima (n_1, k_1, t_1, a_1) i usmjereni graf $\mathcal{G}_2 = \overline{K_{n_2}}$, konstrukcija iz teorema 1.3.7 odgovara konstrukciji iz teorema 2.2.2, za matricu $A \otimes J_m$, gdje je $m = n_2$.

2.3. METODA KONSTRUKCIJE IZ TRANZITIVNIH PERMUTACIJSKIH GRUPA

Opisali smo konstrukciju usmjerenih grafova iz orbitala za djelovanje grupe G na skup Ω . Budući da postoji bijekcija sa skupa orbitala grupe G na skup orbita stabilizatora G_α , $\alpha \in \Omega$, usmjerene regularne grafove možemo konstruirati i koristeći podorbite grupe G kao skupove izlaznih susjeda vrhova usmjerenog grafa.

Sljedeća dva teorema opisuju metodu konstrukcije dizajna iz grupe, a preuzeta su iz [20].

Teorem 2.3.1. Neka je G konačna permutacijska grupa koja djeluje tranzitivno na n -člani skup Ω . Neka je $\alpha \in \Omega$ i $\Delta = \cup_{i=1}^s G_\alpha \cdot \delta_i$, gdje su $\delta_1, \dots, \delta_s \in \Omega$ predstavnici različitih G_α -orbita. Ako je $\Delta \neq \Omega$ i

$$\mathcal{B} = \{g \cdot \Delta \mid g \in G\},$$

tada je $\mathcal{D} = (\Omega, \mathcal{B})$ 1- $(n, |\Delta|, \frac{|G_\alpha|}{|G_\Delta|} \sum_{i=1}^s |G_{\delta_i} \cdot \alpha|)$ dizajn sa $b = \frac{n \cdot |G_\alpha|}{|G_\Delta|}$ blokova na kojeg grupa G djeluje tranzitivno, kao grupa automorfizama.

Uočimo da je $G_\alpha \leq G_\Delta$ pa je $b \leq n$.

Napomena 2.3.1. Posebno, ako je djelovanje iz prethodnog teorema primitivno, tada je $G_\alpha = G_\Delta$, pa je $b = n$, odnosno 1-dizajn je simetričan.

Teorem 2.3.2. Neka je G konačna permutacijska grupa koja djeluje tranzitivno na n -člani skup Ω i neka je H podgrupa grupe G . Neka je $\Delta = \cup_{i=1}^s H \cdot \delta_i$, gdje su $\delta_1, \dots, \delta_s \in \Omega$ predstavnici različitih H -orbita. Tada je

$$\mathcal{B} = \{g \cdot \Delta \mid g \in G\}$$

skup blokova 1-dizajna s parametrima $1 - (n, |\Delta|, \frac{|H|}{|G_\Delta|} \sum_{i=1}^s \frac{|G_{\delta_i}|}{|H \cap G_{\delta_i}|})$ i $b = \frac{|G|}{|G_\Delta|}$ blokova. Grupa G djeluje tranzitivno na skup točaka i blokova dizajna, kao grupa automorfizama.

Napomena 2.3.2. Teorem 2.3.2 je poopćenje teorema 2.3.1, budući da je G_α podgrupa grupe G . Posebno, za $H = G_\alpha$ je

$$b = |G \cdot \Delta| = \frac{|G|}{|G_\Delta|} = \frac{|G| \cdot |G_\alpha|}{|G_\Delta| \cdot |G_\alpha|} = \frac{|\Omega| \cdot |G_\alpha|}{|G_\Delta|} = \frac{n \cdot |G_\alpha|}{|G_\Delta|},$$

$$r = \frac{|G_\alpha|}{|G_\Delta|} \sum_{i=1}^s \frac{|G_{\delta_i}|}{|(G_{\delta_i})_\alpha|} = \frac{|G_\alpha|}{|G_\Delta|} \sum_{i=1}^s |G_{\delta_i} \cdot \alpha|.$$

Teoremi 2.3.1 i 2.3.2 omogućuju konstrukciju i nesimetričnih t -dizajna.

Napomena 2.3.3. Svaki dizajn na kojeg grupa G djeluje tranzitivno na skupu točaka i skupu blokova, može se dobiti konstrukcijom opisanom u teoremu 2.3.1.

U radovima [20] i [21] konstrukcije opisane teoremima 2.3.1 i 2.3.2 autori su primijenili za konstrukciju regularnih grafova. U ovom radu, konstrukciju smo primijenili na usmjerene regularne grafove.

Konstrukcija opisana sljedećim teoremom temelji se na činjenici da je svako tranzitivno djelovanje grupe G na skup Ω ekvivalentno djelovanju grupe G na G/G_α , za $\alpha \in \Omega$.

Teorem 2.3.3. Neka je G konačna permutacijska grupa koja djeluje tranzitivno na skup Ω . Neka je $\alpha \in \Omega$ i neka je Δ orbita za djelovanje stabilizatora G_α na Ω . Neka je $T = \{g_1, \dots, g_t\}$ skup predstavnika lijevih suskupova u $G/G_\alpha = \{g_1G_\alpha, \dots, g_tG_\alpha\}$. Neka je $\mathcal{V} = \{g_i.\alpha \mid i = 1, \dots, t\}$ i neka je $\mathcal{E} = \{(g_i.\alpha, g_i.\beta) \mid i = 1, \dots, t, \beta \in \Delta\}$. Tada je $\mathcal{G} = (\mathcal{V}, \mathcal{E})$ usmjereni graf sa $|\Omega|$ vrhova, koji je $|\Delta|$ -regularan i takav da je $g_i.\Delta$ skup krajnjih vrhova usmjerenih bridova kojima je početni vrh $g_i.\alpha$, $i = 1, \dots, t$, na kojega grupa G djeluje kao grupa automorfizama.

Dokaz. Grupa G djeluje tranzitivno na skup Ω pa za svaki $y \in \Omega$ postoji element g_i transverzale $T = \{g_1, \dots, g_t\}$ takav da je $y = g_i.\alpha$. Dakle, $|\mathcal{V}| = |\Omega|$.

Promotrimo skup izlaznih susjeda vrha α . Zbog djelovanja grupe G na skup Ω slijedi:

$$g.(\alpha, \beta) = (\alpha, g.\beta) \Leftrightarrow g \in G_\alpha.$$

U tom slučaju je $g.\beta \in G_\alpha.\beta$, odnosno skup izlaznih susjeda vrha α je upravo skup Δ .

Pokažimo: ako je Δ skup izlaznih susjeda vrha $\alpha \in \Omega$, onda je $g_i.\Delta$ skup izlaznih susjeda vrha $g_i.\alpha$, $i = 1, \dots, t$. Neka je $x \in \mathcal{V}$, $x \neq \alpha$, i $x \rightarrow y$ usmjereni brid. Tada postoji jedinstveni element transverzale g_i takav da je $x = g_i.\alpha$. Onda je $y = g_i.\beta$, za $\beta \in \Delta$, pa je $g_i.\Delta$ skup krajnjih vrhova usmjerenih bridova čiji je početni vrh $x \neq y$. Skup izlaznih susjeda vrha x je skup $g_i.\Delta$ pa je izlazni stupanj od x jednak $|g_i.\Delta| = |\Delta|$.

Neka je y krajnji vrh nekog brida. Tada postoje $g \in G$ i $\beta \in \Delta$ takvi da je $y = g.\beta$, odnosno $(g.\alpha, g.\beta) \in \mathcal{E}$. Pretpostavimo da postoje $g_1, \dots, g_s \in G$ i $\beta_1, \dots, \beta_s \in \Delta$ takvi da je $y = g_i.\beta_i$, $\forall i \in \{1, \dots, s\}$. Tada je ulazni stupanj vrha y jednak s , a vrhovi $g_i.\alpha$ su ulazni vrhovi od y . Zbog tranzitivnosti, za svaki drugi vrh $y' \neq y$ postoji $g' \in G$ takav da je $y' = g'.y$, odnosno $g'.\alpha$ su ulazni vrhovi od y' . Dakle, i svaki preostali vrh je također ulaznog stupnja s . Kako postoji bijekcija sa skupa $g.\Delta$ na skup Δ koja element $g.x \in g.\Delta$ preslika u $x \in \Delta$, vrijedi $|g.\Delta| = |\Delta|$, pa prebrojavanjem jedinica u retcima i stupcima matrice susjedstva dobivamo:

$$|\Omega| \cdot |\Delta| = |\Omega| \cdot s \Rightarrow s = |\Delta|.$$

Dakle, i ulazni i izlazni stupnjevi vrhova su jednaki $|\Delta|$.

Grupa G djeluje na dobiveni usmjereni graf kao grupa automorfizama, tranzitivno na skup vrhova i skup lukova digrafa. ■

Posljedica 2.3.1.

Budući da orbitale za djelovanje grupe G čine asocijacijsku shemu te postoji bijektivno preslikavanje sa skupa orbitala grupe G na skup G_α -orbita, iz teorema 1.4.3 slijedi da je graf $\mathcal{G} = (\mathcal{V}, \mathcal{E})$ konstruiran metodom opisanom u teoremu 2.3.3 ujedno i usmjereni kvazi-jako regularan graf.

Posljedica 2.3.2.

Matrica susjedstva digrafa dobivenog konstrukcijom iz teorema 2.3.3 zapravo matrica inciden-
cije 1-dizajna. Iz činjenice da grupa G djeluje flag-tranzitivno na pripadni 1-dizajn, slijedi da
grupa G djeluje luk-tranzitivno na dobiveni digraf. Konstrukcije flag-tranzitivnih dizajna opi-
sane su u članku [21].

Napomena 2.3.4. Iz prethodnog teorema slijedi:

1. Ako je Δ samosparena orbita, graf \mathcal{G} je neusmjereni graf. Inače, \mathcal{G} je usmjereni graf.
2. Kako je Δ zapravo G_α -orbita, sigurno vrijedi $G_\alpha \leq G_\Delta$, gdje je G_Δ skupovni stabilizator
od Δ . Naime, za $g \in G_\alpha$ i $\beta \in \Omega$ imamo $g.\Delta = \{g.(g_1.\beta) | g_1 \in G_\alpha\} = \{g'.\beta | g' \in G_\alpha\} = \Delta$
pa je $G_\alpha \subseteq G_\Delta$.
 - Ako je $G_\alpha = G_\Delta$, tada su skupovi $g_i.\Delta$, $i = 1, \dots, t$, krajnjih vrhova usmjerenih bri-
dova kojima su početni vrhovi oblika $g_i.\alpha$, $i = 1, \dots, t$, svi međusobno različiti, jer
je $G/G_\alpha = G/G_\Delta$.
 - Ako je $G_\alpha < G_\Delta$, tada postoje vrhovi $g_i.\alpha$ i $g_j.\alpha$ takvi da su skupovi $g_i.\Delta$ i $g_j.\Delta$
jednaki. Točno $\frac{|G_\Delta|}{|G_\alpha|} = p$ vrhova usmjerenog grafa ima isti skup izlaznih susjeda.
Različiti skupova izlaznih susjeda u tom usmjerenom grafu ima $\frac{|\Omega|}{p} = \frac{n}{p}$.
3. Za djelovanje grupe G , jedna G_α -orbita je samosparena podorbita koju zovemo i dijago-
nala $\{\alpha\}$. Uzmemo li za $\Delta = \{\alpha\}$, konstruirat ćemo trivijalan digraf koji sadrži samo
petlje.

Napomena 2.3.5. Promotrimo li matricu susjedstva jako regularnog grafa, možemo primijetiti
da ne postoje dva vrha sa istim skupom susjeda. Naime, proizvoljna dva vrha jako regularnog
grafa imat će ili λ ili μ zajedničkih susjeda, ovisno o tome jesu li međusobno susjedni ili nisu.
Kod usmjerenih jako regularnih i usmjerenih kvazi-jako regularnih grafova može se dogoditi da
neka dva vrha imaju isti skup izlaznih susjeda. Na primjer, iz matrice susjedstva usmjerenog
jako regularnog grafa s parametrima $DSRG(6, 2, 0, 1, 1)$ iz primjera 1.3.2 vidimo da vrhovi 1 i
4 imaju jednake skupove izlaznih susjeda. Isto vrijedi i za parove vrhova (2, 5) i (3, 6).

U nastavku kroz primjere opisujemo konstrukciju iz teorema 2.3.3 provedenu u program-
skom paketu GAP.

Neka je G konačna grupa. Sve podgrupe grupe G , do na konjugaciju, možemo dobiti u
programskom paketu GAP koristeći naredbu:

$$S := \text{ConjugacyClassesSubgroups}(G);$$

Neka je H predstavnik klase konjugiranosti podgrupa indeksa n . Grupa G djeluje tranzitivno na
skup lijevih suskupova podgrupe H u grupi G , $\Gamma_H = \{aH | a \in G\}$, lijevim množenjem: $g.(aH) =$

$g\alpha H$. To djelovanje grupe G na skup Γ_H inducira permutacijsku reprezentaciju $F : G \rightarrow S(\Gamma_H)$ koja svakom elementu $g \in G$ pridružuje bijekciju $f_g : \Gamma_H \rightarrow \Gamma_H$, $f_g(g_1H) = g \cdot g_1H = (gg_1)H$. Dobivena je permutacijska reprezentacija grupe G na $n = |\Gamma_H| = [G : H]$ točaka. Sliku tranzitivne permutacijske reprezentacije grupe G ($Im(F)$) može se dobiti korištenjem naredbe:

```
T:=Image(FactorCosetAction(G,H));
```

Dakle, grupa G djeluje tranzitivno na skup $\Omega = \{1, \dots, n\}$. Fiksiramo element $\alpha \in \Omega$ te pomoću naredbe

```
Ga:=Stabilizer(T,alpha);
```

odredimo stabilizator elementa α za djelovanje grupe G . Potrebno je odrediti i orbite stabilizatora G_α te elemente transversale:

```
orbite:=Orbits(Ga,omega);
trans:=RightTransversal(G,Ga);
```

Svaka orbita Δ predstavlja skup izlaznih susjeda vrha $\alpha \in \Omega$ jednog usmjerenog grafa. Skupovi izlaznih susjeda vrhova $g_i \cdot \alpha$ oblika su $g_i \cdot \Delta$, gdje je g_i element transversale, $i = 1, \dots, n$.

U nastavku dajemo primjer konstrukcije usmjerenog regularnog grafa iz G_α -orbita tranzitivne permutacijske grupe D_3 .

Primjer 2.3.1. Grupa $D_3 \cong \langle (1, 2)(3, 6)(4, 5), (1, 3, 5)(2, 4, 6) \rangle$ djeluje tranzitivno na skup $\Omega = \{1, 2, 3, 4, 5, 6\}$. Neka je $\alpha = 1 \in \Omega$. Tada je stabilizator $G_\alpha = G_1 = \{\text{id}\}$. Orbite za djelovanje stabilizatora G_α su: $\Delta_0 = \{1\}$, $\Delta_1 = \{2\}$, $\Delta_2 = \{3\}$, $\Delta_3 = \{4\}$, $\Delta_4 = \{5\}$, $\Delta_5 = \{6\}$.

Elementi transversale su: $g_1 = \text{id}$, $g_2 = (1, 2)(3, 6)(4, 5)$, $g_3 = (1, 3, 5)(2, 4, 6)$, $g_4 = (1, 4)(2, 3)(5, 6)$, $g_5 = (1, 5, 3)(2, 6, 4)$, $g_6 = (1, 6)(2, 5)(3, 4)$.

Uzmimo podorbitu $\Delta_2 = \{3\}$. Podorbita Δ_2 je skup izlaznih susjeda vrha $\alpha = 1$. Konstrukcijom dobivamo:

$$\begin{aligned} g_1 \cdot \{3\} &= \{3\} \text{ je skup izlaznih susjeda vrha } g_1 \cdot \alpha = 1, \\ g_2 \cdot \{3\} &= \{6\} \text{ je skup izlaznih susjeda vrha } g_2 \cdot \alpha = 2, \\ g_3 \cdot \{3\} &= \{5\} \text{ je skup izlaznih susjeda vrha } g_3 \cdot \alpha = 3, \\ g_4 \cdot \{3\} &= \{2\} \text{ je skup izlaznih susjeda vrha } g_4 \cdot \alpha = 4, \\ g_5 \cdot \{3\} &= \{1\} \text{ je skup izlaznih susjeda vrha } g_5 \cdot \alpha = 5, \\ g_6 \cdot \{3\} &= \{4\} \text{ je skup izlaznih susjeda vrha } g_6 \cdot \alpha = 6, \end{aligned}$$

Dobivamo usmjereni graf sa matricom susjedstva

$$A = \begin{bmatrix} 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \end{bmatrix}$$

i to je usmjereni kvazi-jako regularan graf s parametrima $(6, 1, 0, 0; 1, 0)$.

Primjer 2.3.2. Grupa $\mathbb{Z}_2 \times A_4 \cong \langle (3, 6), (1, 3, 5)(2, 4, 6) \rangle$ djeluje tranzitivno na skup $\Omega = \{1, 2, 3, 4, 5, 6\}$. Neka je $\alpha = 1 \in \Omega$. Tada je stabilizator $G_\alpha = G_1 \cong \langle (3, 6), (2, 5) \rangle \cong \mathbb{Z}_2 \times \mathbb{Z}_2$. Orbite za djelovanje stabilizatora G_α su: $\Delta_0 = \{1\}$, $\Delta_1 = \{2, 5\}$, $\Delta_2 = \{3, 6\}$, $\Delta_3 = \{4\}$. Elementi transverzale su: $g_1 = \text{id}$, $g_2 = (1, 2, 6, 4, 5, 3)$, $g_3 = (1, 3, 5)(2, 4, 6)$, $g_4 = (1, 4)$, $g_5 = (1, 5, 3)(2, 6, 4)$, $g_6 = (1, 6, 2, 4, 3, 5)$.

Uzmimo podorbitu $\Delta_1 = \{2, 5\}$. Podorbita Δ_1 je skup izlaznih susjeda vrha $\alpha = 1$. Konstrukcijom dobivamo:

$$\begin{aligned} g_1 \cdot \{2, 5\} &= \{2, 5\} \text{ je skup izlaznih susjeda vrha } g_1 \cdot \alpha = 1, \\ g_2 \cdot \{2, 5\} &= \{3, 6\} \text{ je skup izlaznih susjeda vrha } g_2 \cdot \alpha = 2, \\ g_3 \cdot \{2, 5\} &= \{1, 4\} \text{ je skup izlaznih susjeda vrha } g_3 \cdot \alpha = 3, \\ g_4 \cdot \{2, 5\} &= \{2, 5\} \text{ je skup izlaznih susjeda vrha } g_4 \cdot \alpha = 4, \\ g_5 \cdot \{2, 5\} &= \{3, 6\} \text{ je skup izlaznih susjeda vrha } g_5 \cdot \alpha = 5, \\ g_6 \cdot \{2, 5\} &= \{1, 4\} \text{ je skup izlaznih susjeda vrha } g_6 \cdot \alpha = 6, \end{aligned}$$

Dobivamo usmjereni graf sa matricom susjedstva

$$A = \begin{bmatrix} 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1 \\ 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1 \\ 1 & 0 & 0 & 1 & 0 & 0 \end{bmatrix}$$

i to je usmjereni kvazi-jako regularan graf s parametrima $(6, 2, 0, 0; 2, 0)$.

U nastavku dajemo poopćenje konstrukcije iz teorema 2.3.3; za skup izlaznih susjeda proizvoljnog vrha usmjerenog regularnog grafa uzimamo proizvoljne unije podorbita.

Teorem 2.3.4. Neka je G konačna permutacijska grupa koja djeluje tranzitivno na skup Ω . Neka je $\alpha \in \Omega$ i neka je $\Delta = \bigcup_{i=1}^s G_\alpha \cdot \delta_i$ unija orbita stabilizatora G_α od α , gdje su $\delta_1, \dots, \delta_s$ predstavnici različitih G_α -orbita. Neka je $T = \{g_1, \dots, g_t\}$ skup predstavnika lijevih suskupova u $G/G_\alpha = \{g_1 G_\alpha, \dots, g_t G_\alpha\}$. Neka je $\mathcal{V} = \{g_i \cdot \alpha \mid i = 1, \dots, t\}$ i neka je $\mathcal{E} = \{(g_i \cdot \alpha, g_i \cdot \beta) \mid i = 1, \dots, t, \beta \in \Delta\}$. Tada je $(\mathcal{V}, \mathcal{E})$ usmjereni graf s $|\Omega|$ vrhova koji je $|\Delta|$ -regularan i takav da je $g_i \cdot \Delta$ skup krajnjih vrhova usmjerenih bridova kojima je početni vrh $g_i \cdot \alpha$, $i = 1, \dots, t$.

Dokaz. Grupa G djeluje tranzitivno na skup Ω pa za svaki $y \in \Omega$ postoji element transverzale $T = \{g_1, \dots, g_t\}$ takav da je $y = g_i \cdot \alpha$, $\alpha \in \Omega$, $i = 1, \dots, t$. Dakle, $|\mathcal{V}| = |\Omega|$.

Skup Δ je unija orbita stabilizatora G_α za djelovanje grupe G . Zbog djelovanja grupe G na skup Ω slijedi:

$$g \cdot (\alpha, \beta) = (\alpha, g \cdot \beta) \Leftrightarrow g \in G_\alpha.$$

Dakle, za $\beta \in G_\alpha \cdot \delta_i, i = 1, \dots, s$, je $g \cdot \beta \in G_\alpha \cdot \beta$, odnosno skup izlaznih susjeda vrha α je upravo skup $\cup_{i=1}^s G_\alpha \cdot \delta_i = \Delta$.

Pokažimo: ako je Δ skup izlaznih susjeda vrha $\alpha \in \Omega$, onda je $g_i \cdot \Delta$ skup izlaznih susjeda vrha $g_i \cdot \alpha, i = 1, \dots, t$. Neka je $x \in \mathcal{V}, x \neq \alpha$ i $x \rightarrow y$ usmjereni brid. Tada postoji jedinstveni element transverzale g_i takav da je $x = g_i \cdot \alpha$. Onda je $y = g_i \beta, \beta \in \Delta = G_\alpha \cdot \Delta, i = 1, \dots, s$, pa je $g_i \cdot \cup_{i=1}^s G_\alpha \cdot \delta_i = g_i \cdot \Delta$ skup krajnjih vrhova usmjerenih bridova čiji je početni vrh $x \neq y$. Skup izlaznih susjeda vrha x je skup $g_i \cdot \Delta$ pa je izlazni stupanj od x jednak $|g_i \cdot \Delta| = |\Delta|$.

Neka je y krajnji vrh nekog brida. Tada postoje $g \in G$ i $\beta \in \Delta$ takvi da je $y = g \cdot \beta$, odnosno $(g \cdot \alpha, g \cdot \beta) \in \mathcal{E}$. Pretpostavimo da postoje $g_1, \dots, g_s \in G$ i $\beta_1, \dots, \beta_s \in \Delta$ takvi da je $y = g_i \cdot \beta_i, \forall i \in \{1, \dots, s\}$. Tada je ulazni stupanj vrha y jednak s , a vrhovi $g_i \cdot \alpha$ su ulazni vrhovi od y . Zbog tranzitivnosti, za svaki drugi vrh $y' \neq y$ postoji $g' \in G$ takav da je $y' = g' \cdot y$, odnosno $g' \cdot g \cdot \alpha$ su ulazni vrhovi od y' . Dakle, i svaki preostali vrh je također ulaznog stupnja s . Kako postoji bijekcija sa skupa $g \cdot \Delta$ na skup Δ koja element $g \cdot x \in g \cdot \Delta$ preslika u $x \in \Delta$ pa je $|g \cdot \Delta| = |g \cdot \cup_{i=1}^s G_\alpha \cdot \delta_i| = |\cup_{i=1}^s g G_\alpha \cdot \delta_i| = |\cup_{i=1}^s G_\alpha \cdot \delta_i| = |\Delta|$, prebrojavanjem jedinica u retcima i stupcima matrice susjedstva dobivamo:

$$|\Omega| \cdot |\Delta| = |\Omega| \cdot s \Rightarrow s = |\Delta|.$$

Dakle, i ulazni i izlazni stupnjevi vrhova su jednaki $|\Delta|$.

Grupa G djeluje na dobiveni usmjereni graf kao grupa automorfizama, tranzitivno na skup vrhova digrafa i netranzitivno na skup bridova/lukova. ■

Napomena 2.3.6. Iz prethodnog teorema slijedi:

1. Ako je Δ unija međusobno uparenih i samosparenih orbita, tada dobivamo neusmjereni graf. Inače, dobivamo usmjereni graf.
2. Kako je Δ unija G_α -orbita, sigurno vrijedi $G_\alpha \leq G_\Delta$, gdje je G_Δ skupovni stabilizator od Δ . Kao i u napomeni 2.3.4, možemo promatrati usmjerene grafove za koje su skupovi izlaznih susjeda svi međusobno različiti, te usmjerene grafove za koje postoje vrhovi sa istim skupom izlaznih susjeda, ovisno o tome je li $G_\alpha = G_\Delta$ ili $G_\alpha < G_\Delta$, odnosno je li $G/G_\alpha = G/G_\Delta$ ili $G/G_\alpha \subset G/G_\Delta$.
3. Uzmemo li u uniju i podorbitu $\{\alpha\}$, konstruirat ćemo digraf koji sadrži i petlje.

Dok smo teoremom 2.3.3 konstruirali usmjerene grafove iz proizvoljne G_α -orbite, teoremom 2.3.4 konstruiramo usmjerene grafove tako da je skup izlaznih susjeda proizvoljnog vrha digrafa unija orbita stabilizatora za djelovanje grupe G na skupu $\{1, \dots, n\}$.

Nakon što smo odredili sve G_α -orbite, uzimamo proizvoljnu uniju G_α -orbita, $\Delta = \cup_{i=1}^s G_\alpha \cdot \delta_i$, gdje su δ_i predstavnici različitih G_α -orbita. Svaka takva unija Δ predstavlja skup izlaznih susjeda vrha $\alpha \in \Omega$ jednog usmjerenog grafa. Skupovi izlaznih susjeda vrhova $g_i \cdot \alpha$ oblika su $g_i \cdot \Delta$, gdje je g_i element transverzale, $i = 1, \dots, n$.

Primjer 2.3.3. Za djelovanje grupe D_3 na skup $\Omega = \{1, 2, 3, 4, 5, 6\}$ opisano u primjeru 2.3.1, uzmimo uniju podorbita $\Delta_1 = \{2\}$ i $\Delta_2 = \{3\}$ za skup izlaznih susjeda vrha $\alpha = 1 \in \Omega$.

Konstrukcijom dobivamo:

$$\begin{aligned} g_1 \cdot \{2, 3\} &= \{2, 3\} \text{ je skup izlaznih susjeda vrha } g_1 \cdot \alpha = 1, \\ g_2 \cdot \{2, 3\} &= \{1, 6\} \text{ je skup izlaznih susjeda vrha } g_1 \cdot \alpha = 2, \\ g_3 \cdot \{2, 3\} &= \{4, 5\} \text{ je skup izlaznih susjeda vrha } g_1 \cdot \alpha = 3, \\ g_4 \cdot \{2, 3\} &= \{3, 2\} \text{ je skup izlaznih susjeda vrha } g_1 \cdot \alpha = 4, \\ g_5 \cdot \{2, 3\} &= \{6, 1\} \text{ je skup izlaznih susjeda vrha } g_1 \cdot \alpha = 5, \\ g_6 \cdot \{2, 3\} &= \{5, 4\} \text{ je skup izlaznih susjeda vrha } g_1 \cdot \alpha = 6, \end{aligned}$$

Dobivamo usmjereni graf sa matricom susjedstva

$$A = \begin{bmatrix} 0 & 1 & 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 0 \end{bmatrix}$$

i to je usmjereni jako regularan graf s parametrima $(6, 2, 0, 1, 1)$.

Teoremima 2.3.3 i 2.3.4 opisana je konstrukcija usmjerenih regularnih grafova iz skupa Ω na kojega grupa G djeluje tranzitivno. Međutim, svaki usmjereni regularan graf takav da grupa G djeluje tranzitivno na skup vrhova tog digrafa je izomorfan digrafu iz teorema 2.3.3 ili teorema 2.3.4, odnosno vrijedi sljedeći teorem.

Teorem 2.3.5. Ako grupa G djeluje tranzitivno na skup vrhova usmjerenog regularnog grafa $\mathcal{G} = (\mathcal{V}, \mathcal{E})$, onda postoji skup Ω takav da su vrhovi i lukovi tog usmjerenog grafa \mathcal{G} definirani na način opisan teoremom 2.3.3 ili teoremom 2.3.4.

Dokaz. Neka je α vrh digrafa \mathcal{G} i neka je Δ skup izlaznih susjeda vrha α .

Neka je δ_1 vrh u skupu Δ . Promotrimo djelovanje podgrupe G_α na vrh δ_1 . Orbita $G_\alpha \cdot \delta_1$ sadržana je u skupu Δ , jer za $g \in G_\alpha$ vrijedi $g \cdot (\alpha, \delta_1) = (\alpha, g \cdot \delta_1)$. Ako je $G_\alpha \cdot \delta_1 \neq \Delta$, onda je $G_\alpha \cdot \delta_2 \subseteq \Delta$, za neki vrh $\delta_2 \in \Delta$ koji nije sadržan u orbiti $G_\alpha \cdot \delta_1$. Slijedi da je skup Δ unija G_α -orbita, odnosno $\Delta = \cup_{i=1}^s G_\alpha \cdot \delta_i$, za neki prirodan broj s .

Grupa G djeluje tranzitivno na skup vrhova digrafa \mathcal{G} pa je $\mathcal{V} = G \cdot \alpha$. ■

Napomena 2.3.7. Konstrukcije iz teorema 2.3.3 i 2.3.4 daju usmjerene regularne grafove. U nastavku rada, nas će zanimati konstruirani usmjereni jako regularni grafovi i usmjereni kvazi-jako regularni grafovi.

Konstrukcija komplementa preko G_α -orbita

Neka je \mathcal{G} usmjereni kvazi-jako regularan graf konstruiran metodom opisanom u teoremu 2.3.4. Neka grupa G djeluje tranzitivno na skup Ω , neka je $\alpha \in \Omega$ i neka je Δ proizvoljna G_α -orbita za djelovanje grupe G , različita od dijagonale $\{\alpha\}$, takva da je Δ skup izlaznih susjeda od α . Uzmemo li uniju svih podorbita različitih od dijagonale, izuzevši podorbitu Δ , dobit ćemo skup izlaznih susjeda vrha $\alpha \in \Omega$ usmjerenog grafa koji je komplement usmjerenog kvazi-jako regularnog grafa.

Neka permutacijska grupa G djeluje tranzitivno na konačan skup Ω . Neka je $\alpha \in \Omega$ i neka su $\Delta_0 = \{\alpha\}, \Delta_1, \dots, \Delta_{r-1}$ G_α -orbite za djelovanje grupe G . Ako je podorbita $\Delta_i \neq \{\alpha\}$, $i = 1, \dots, r-1$, skup izlaznih susjeda vrha α kvazi-jako regularnog usmjerenog grafa s parametrima $(n, k, t, a; c_1, \dots, c_p)$, onda je unija $\Delta = \left(\cup_{j=1}^{r-1} \Delta_j \right) \setminus \Delta_i$ skup izlaznih susjeda vrha α komplementa tog usmjerenog kvazi-jako regularnog grafa s parametrima $\text{QSRD}^C(n, k', t', A'; b_1, \dots, b_p)$.

Primjer 2.3.4. Komplement usmjerenog kvazi-jako regularnog grafa s parametrima $(6, 1, 0, 0; 1, 0)$ iz primjera 2.3.1 dobit ćemo uzmemo li za vrh $\alpha = 1 \in \Omega$ skup izlaznih susjeda $\Delta = \left(\cup_{i=1}^5 \Delta_i \right) \setminus \Delta_2$. Tada je $\Delta = \{2, 4, 5, 6\}$ skup izlaznih susjeda vrha $\alpha \in \Omega$. Djelovanjem grupe D_3 dobivamo skupove izlaznih susjeda preostalih vrhova:

$$\begin{aligned} g_1.\Delta &= \{2, 4, 5, 6\} \text{ je skup izlaznih susjeda vrha } g_1.\alpha = 1, \\ g_2.\Delta &= \{1, 3, 4, 5\} \text{ je skup izlaznih susjeda vrha } g_2.\alpha = 2, \\ g_3.\Delta &= \{1, 2, 4, 6\} \text{ je skup izlaznih susjeda vrha } g_3.\alpha = 3, \\ g_4.\Delta &= \{1, 3, 5, 6\} \text{ je skup izlaznih susjeda vrha } g_4.\alpha = 4, \\ g_5.\Delta &= \{2, 3, 4, 6\} \text{ je skup izlaznih susjeda vrha } g_5.\alpha = 5, \\ g_6.\Delta &= \{1, 2, 3, 5\} \text{ je skup izlaznih susjeda vrha } g_6.\alpha = 6. \end{aligned}$$

Dobivamo usmjereni graf s matricom susjedstva

$$A = \begin{bmatrix} 0 & 1 & 0 & 1 & 1 & 1 \\ 1 & 0 & 1 & 1 & 1 & 0 \\ 1 & 1 & 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 & 1 & 0 \end{bmatrix}$$

i to je komplement usmjerenog kvazi-jako regularnog grafa s parametrima $\text{QSRD}^C(6, 4, 3, 4; 3, 2)$.

2.4. METODA KONSTRUKCIJE NETRANZITIVNIH USMJERENIH GRAFOVA

U ovom poglavlju bavit ćemo se metodom konstrukcije usmjerenih regularnih grafova iz netranzitivnih permutacijskih grupa. Konstrukcija u nastavku poglavlja opisana je u radu [14], gdje su autori konstruirali 2-dizajne, i [23], gdje je primijenjena za konstrukciju jako regularnih grafova.

Započinjemo od postojećeg usmjerenog grafa i analiziramo ga. Neka je M matrica susjedstva usmjerenog grafa \mathcal{G} i neka je G njegova grupa automorfizama. Grupa G djeluje na skup vrhova digrafa u m orbita $\mathcal{O}_1, \dots, \mathcal{O}_m$.

$$M = \begin{matrix} & \begin{matrix} \mathcal{O}_1 & \mathcal{O}_2 & \dots & \mathcal{O}_j & \dots & \mathcal{O}_m \end{matrix} \\ \begin{matrix} \mathcal{O}_1 \\ \mathcal{O}_2 \\ \vdots \\ \mathcal{O}_i \\ \vdots \\ \mathcal{O}_m \end{matrix} & \left(\begin{array}{cccccc} \hline & & & & & \\ \hline & & & & & \\ \hline & & & & & \\ \hline & & & M_{ij} & & \\ \hline & & & & & \\ \hline & & & & & \\ \hline & & & & & \\ \hline \end{array} \right) \end{matrix}$$

Neka je M_{ij} podmatrica matrice M . M_{ij} je matrica incidencije 1-dizajna \mathcal{D}_{ij} kojemu je \mathcal{O}_j skup točaka i \mathcal{O}_i skup blokova:

$$\mathcal{O}_j = \{P_{j_1}, \dots, P_{j_k}\}, \mathcal{O}_i = \{B_{i_1}, \dots, B_{i_l}\}.$$

Točka $P_p \in \mathcal{O}_j$ je incidentna s blokom $B_b \in \mathcal{O}_i$ ako i samo ako su vrhovi P_p i B_b susjedni u digrafu \mathcal{G} , $p \in \{j_1, \dots, j_k\}$, $b \in \{i_1, \dots, i_l\}$. Uočimo da 1-dizajni ne moraju biti simetrični.

Kako su skup točaka i skup blokova dizajna \mathcal{D}_{ij} upravo orbite grupe G \mathcal{O}_j i \mathcal{O}_i , grupa G djeluje tranzitivno na skup točaka i skup blokova dizajna \mathcal{D}_{ij} .

Neka je S_i stabilizator nekog elementa $x \in \mathcal{O}_i$ za djelovanje grupe G . Djelovanje od G na \mathcal{O}_i je permutacijski izomorfno djelovanju od G na G/S_i množenjem slijeva. Analogno, djelovanje grupe G na \mathcal{O}_j permutacijski je izomorfno djelovanju od G na G/S_j , gdje je S_j stabilizator elementa $x \in \mathcal{O}_j$. Dakle, točke dizajna \mathcal{D}_{ij} možemo predstaviti suskupovima G/S_j , a blokove suskupovima G/S_i .

Konstrukciju 1-dizajna \mathcal{D}_{ij} možemo opisati na sljedeći način:

Neka je $\Omega_2 = G/S_j$ i $\Omega_1 = G/S_i$. Postoji $\alpha \in \Omega_1$ i $\delta_1, \dots, \delta_s \in \Omega_2$, različiti predstavnici G_α -orbita, takvi da je $\Delta_2 = \cup_{i=1}^s G_\alpha \cdot \delta_i$. Tada je skup blokova 1-dizajna

$$\mathcal{B} = \{g \cdot \Delta_2 | g \in G\}.$$

Obrnuto, novi usmjereni graf možemo konstruirati tako da za različite odabire $\delta_1, \dots, \delta_s$ dobi-

vamo različite osnovne blokove, odnosno različite relacije incidencije na incidencijskim strukturama sa skupom točaka Ω_2 i skupom blokova Ω_1 .

Neka grupa G djeluje tranzitivno na skup Ω u m orbita i neka su S_1, \dots, S_m stabilizatori za djelovanje grupe G . Želimo konstruirati sve podmatrice M_{i1}, \dots, M_{im} matrice susjedstva M , za neki fiksni i . Uočimo da sve strukture kojima su matrice incidencije M_{i1}, \dots, M_{im} imaju isti skup blokova ($\Omega_1 = G/S_i$), dok su skupovi vrhova međusobno različiti. Stoga ćemo za skup vrhova nove strukture uzeti uniju $G/S_1 \cup \dots \cup G/S_m$. Osnovni blok za novu strukturu biti će unija osnovnih blokova za svaki G/S_j . Ukoliko želimo dobiti sve osnovne blokove nove strukture, moramo napraviti sve unije osnovnih blokova struktura kojima su matrice incidencije M_{i1}, \dots, M_{im} . Također, želimo li dobiti osnovni blok veličine k , moramo uzeti uniju veličine k .

Primjer 2.4.1. Grupa $H = D_6$ ima 14 podgrupa. Odaberimo jednu od njih, na primjer grupu $G = S_3$. Podgrupe grupe G do na konjugaciju su: $P_1 = 1, P_2 = \mathbb{Z}_2, P_3 = \mathbb{Z}_3$ i $P_4 = S_3$.

Unija $G/P_1 \cup G/P_2 \cup G/P_3 \cup G/P_4$ je skup vrhova strukture koju želimo konstruirati. Nova incidencijska struktura imat će 12 vrhova. Za kreiranje osnovnog bloka nove strukture odabrat ćemo za $G_\alpha = P_2$ te tražimo $G_\alpha \cdot G/P_i, i = 1, 2, 3, 4$.

Uzimajući proizvoljne unije G_α -orbita, dobivamo sljedeće osnovne blokove kao uniju osnovnih blokova manjih struktura:

$$\Delta_1 = \{3, 4\} \cup \{7, 8, 9\} \cup \{10\} \cup \emptyset \text{ i } \Delta_2 = \{2, 3, 4, 6\} \cup \emptyset \cup \{10\} \cup \{12\}.$$

Matricu incidencije nove strukture dobit ćemo na sljedeći način:

$$\mathcal{B}_1 = \{g \cdot \Delta_1 | g \in G\}, \mathcal{B}_2 = \{g \cdot \Delta_2 | g \in G\}.$$

$$M = \begin{pmatrix} 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 & 1 & 0 & 1 & 1 & 1 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 & 1 & 0 & 1 & 1 & 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \\ \hline 0 & 1 & 1 & 1 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 1 & 1 & 0 \\ 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 1 & 1 & 1 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 1 & 1 & 0 \end{pmatrix}$$

Matrica M je ujedno i matrica susjedstva usmjerenog jako regularnog grafa s parametrima $(12, 6, 2, 4, 4)$.

3. PRIMJERI KONSTRUKCIJE

U ovom ćemo poglavlju navesti algoritam konstrukcije i strukture konstruirane na način opisan u poglavlju 2.3.

3.1. ALGORITAM KONSTRUKCIJE

U nastavku ćemo navesti korake konstrukcije usmjerenih regularnih grafova metodom opisanom u teoremima 2.3.3 i 2.3.4 za tranzitivno djelovanje grupe G .

1. korak: određivanje tranzitivnih permutacijskih reprezentacija konačne grupe G i predstavnika klasa konjugiranosti podgrupa.

- Kao što je opisano u poglavlju 2.3., sve podgrupe grupe G , do na konjugaciju, možemo dobiti u programskom paketu GAP koristeći naredbu:

```
ConjugacyClassesSubgroups(G);
```

- Sve tranzitivne permutacijske reprezentacije grupe G dobili smo korištenjem naredbe

```
Image(FactorCosetAction(G,H));
```

za svakog prethodno dobivenog predstavnika klasa konjugiranosti podgrupa grupe G , gdje je H predstavnik klase. Algoritam prolazi po svim dobivenim tranzitivnim permutacijskim reprezentacijama grupe G .

2. korak: određivanje orbita stabilizatora G_α i traženje svih mogućih unija podorbita grupe G .

- Za odabranu tranzitivnu permutacijsku reprezentaciju grupe G na skupu $\Omega = \{1, \dots, n\}$ fiksiramo element $\alpha \in \Omega$ i određujemo njegov stabilizator, na primjer:

```
a:=1;  
Ga:=Stabilizer(G,a);
```

- Zatim određujemo orbite stabilizatora G_α naredbom

```
orbite:=Orbits(Ga, [1..n]);
```

i elemente transverzale naredbom

```
RightTransversal(G, Ga);
```

- Naredbom

```
Combinations(orbite, i);
```

uz već određene orbite, dobit ćemo i sve moguće unije od i skupova G_α -orbita različitih od dijagonale. Svaki od tih skupova predstavlja skup izlaznih susjeda vrha $\alpha \in \Omega$ jednog usmjerenog grafa.

3. korak: Konstrukcija matrica susjedstva usmjerenih regularnih grafova i konstrukcija usmjerenih regularnih grafova iz matrice susjedstva.

- Za svaku uniju Δ podorbita grupe G , koja predstavlja skup izlaznih susjeda vrha $\alpha \in \Omega$, djelovanjem elemenata $g_i, i = 1, \dots, t$, transverzale dobivamo skupove $g_i \Delta$, koji predstavljaju skupove izlaznih susjeda vrhova $g_i \alpha$. Konstruiramo $n \times n$ matricu susjedstva svakog usmjerenog grafa.
- Usmjerene regularne grafove iz njihovih matrica susjedstva konstruiramo korištenjem paketa "Digraphs" ([24]) u GAP-u, i to naredbom

```
D:=DigraphByAdjacencyMatrix(M);
```

4. korak: Provjera parametara konstruiranih usmjerenih grafova, određivanje pune grupe automorfizama i broja dobivenih usmjerenih grafova s određenim parametrima, do na izomorfizam digrafova.

- Funkcijama napisanim u programskom paketu GAP provjeravamo parametre dobivenih usmjerenih grafova; provjeravamo koji od njih su jako regularni, usmjereni jako regularni, kvazi-jako regularni te usmjereni kvazi-jako regularni grafovi, kao i koji od njih su dvostruko regularni turniri.
- Za usmjerene grafove čije smo parametre odredili prethodno, određujemo strukturu pune grupe automorfizama ili njezin red, te provjeravamo koji od usmjerenih grafova s istim parametrima su međusobno izomorfni:

```
StructureDescription(AutomorphismGroup(D));  
IsIsomorphicDigraph(D1, D2);
```

- Analiziramo parametre i svojstva poznatih jako regularnih i usmjerenih jako regularnih grafova kako bismo vidjeli jesmo li konstruirali digraf čija matrica susjedstva do sad nije poznata.
- Za zahtjevnije dijelove koda koji iziskuju više vremena, koristili smo programski paket MAGMA ([6]).

3.2. GRAFOVI IZ GRUPA RANGA TRI I RANGA ČETIRI

3.2.1. Grafovi iz grupa ranga tri

Za danu tranzitivnu permutacijsku grupu na skupu Ω , broj G_α -orbita ne ovisi o $\alpha \in \Omega$. Neka je G grupa koja djeluje tranzitivno na konačan skup Ω , $|\Omega| = n$, takva da za $\alpha \in \Omega$, G_α ima točno tri orbite

$$\Delta_0 = \{\alpha\}, \Delta_1(\alpha), \Delta_2(\alpha).$$

Svaka podorbita Δ_i , $i = 0, 1, 2$, je skup izlaznih susjeda vrha $\alpha \in \Omega$ usmjerenog grafa \mathcal{G}_i , čiji je skup vrhova Ω . Po teoremu 1.4.2, ako je G_α -orbita Δ_i , $i = 1, 2$, samosparena, onda je ona skup izlaznih susjeda vrha $\alpha \in \Omega$ neusmjerenog grafa - jako regularnog grafa. S druge strane, ako su podorbite Δ_1 i Δ_2 međusobno uparene, iz teorema 1.4.1 slijedi da je svaka od tih podorbita skup izlaznih susjeda vrha $\alpha \in \Omega$ usmjerenog grafa - dvostruko regularnog turnira.

Dakle, ako je G permutacijska grupa ranga tri parnog reda na konačnom skupu Ω , $|\Omega| = n$, i ako su Δ_1 i Δ_2 podorbite za djelovanje grupe G različite od $\{\alpha\}$, onda po lemi 1.1.2 i teoremu 1.4.2 grafovi \mathcal{G}_1 i \mathcal{G}_2 , čiji je skup vrhova Ω , a skup izlaznih susjeda vrha $\alpha \in \Omega$ je Δ_1 , odnosno Δ_2 , respektivno, čine komplementarni par jako regularnih grafova, od kojih svaki dopušta grupu automorfizama ranga tri.

Unija samosparenih podorbita Δ_1 i Δ_2 je skup izlaznih susjeda vrha $\alpha \in \Omega$ u potpunom grafu na $|\Omega|$ vrhova. Potpuni graf je jako regularan.

Ako je grupa G ranga tri neparnog reda, onda su podorbite Δ_1 i Δ_2 za djelovanje grupe G , različite od $\{\alpha\}$, međusobno uparene podorbite. Po teoremu 1.4.1, za uparene podorbite Δ_1 i Δ_2 grupe ranga tri, grafovi \mathcal{G}_1 i \mathcal{G}_2 kojima je skup vrhova Ω , a skup izlaznih susjeda vrha $\alpha \in \Omega$ je Δ_1 , odnosno Δ_2 , su dvostruko regularni turniri. Uzmemo li uniju podorbita Δ_1 i Δ_2 za skup izlaznih susjeda vrha $\alpha \in \Omega$, dobit ćemo potpuni graf.

Dakle, konstrukcija regularnih usmjerenih grafova iz podorbita grupe G ranga tri navedena u teoremima 2.3.3 i 2.3.4 ne daje usmjerene jako regularne grafove ($0 < t < k$). U tablici 3.1 navedeni su parametri nekih jako regularnih grafova i dvostruko regularnih turnira dobivenih konstrukcijom iz teorema 2.3.3, do na izomorfizam grafova.

Grupa	Red grupe	$ \Delta_1 $	$ \Delta_2 $	Regularan digraf
$A_5 \leq S_5$	60	3		SRG(10,3,0,1)
$\mathbb{Z}_3 \leq A_5$	3	1	1	DRT(3,1,0,1)
$\mathbb{Z}_7 : \mathbb{Z}_3 \leq A_7$	21	3	3	DRT(7,3,1,2)
$\mathbb{Z}_{11} : \mathbb{Z}_5 \leq M_{11}$	55	5	5	DRT(11,5,2,3)

Tablica 3.1: Regularni grafovi i digrafovi dobiveni iz grupa ranga tri

3.2.2. Grafovi iz grupa ranga četiri

Neka grupa G djeluje tranzitivno ranga četiri na skup Ω . Grupa G tada djeluje na skup Ω u četiri podorbite, na jedan od sljedećih načina:

1. podorbite $\Delta_0 = \{\alpha\}$, jedna samosparena podorbite Δ_1 i dvije međusobno uparene podorbite Δ_2 i Δ_3 , ili
2. podorbite $\Delta_0 = \{\alpha\}$ i tri samosparene podorbite.

Promatramo prvi slučaj jer želimo dobiti usmjerene grafove (za drugi slučaj, konstrukcijama opisanim u teoremu 2.3.3 i teoremu 2.3.4 dobit ćemo samo neusmjerene grafove).

Svaka uparena podorbite (Δ_2 ili Δ_3) je, po teoremu 1.4.3, skup izlaznih susjeda vrha $\alpha \in \Omega$ usmjerenog kvazi-jako regularnog grafa. Kako su podorbite Δ_2 i Δ_3 uparene, grafovi koje konstruiramo bit će usmjereni pa je parametar t jednak nuli, što znači da dobiveni grafovi neće biti usmjereni jako regularni grafovi. Uzmemo li kao skup izlaznih susjeda vrha $\alpha \in \Omega$ uniju samosparene podorbite Δ_1 i jedne uparene podorbite Δ_j , dobit ćemo usmjereni regularan graf koji je komplement usmjerenog kvazi-jako regularnog grafa čiji je osnovni blok podorbite Δ_j , $j \neq i$, $i = 2, 3$.

Primjer 3.2.1. Grupa $\mathbb{Z}_2^3 : (\mathbb{Z}_7 : \mathbb{Z}_3)$ djeluje tranzitivno ranga četiri na skup $\Omega = \{1, \dots, 14\}$ u četiri podorbite: $|\Delta_0| = |\{\alpha\}| = 1$, $|\Delta_1| = 1$, $|\Delta_2| = 6$ i $|\Delta_3| = 6$. Podorbite Δ_1 je samosparena, a podorbite Δ_2 i Δ_3 su međusobno uparene podorbite.

Konstrukcijom iz teorema 2.3.3 iz podorbite Δ_1 dobit ćemo neusmjereni 1-regularan graf, a iz podorbite Δ_2 i Δ_3 međusobno izomorfne usmjerene kvazi-jako regularne grafove s parametrima $(14, 6, 0, 2; 4, 0)$.

Konstrukcijom iz teorema 2.3.4, promatrajući unije podorbite $\Delta_1 \cup \Delta_2$ i $\Delta_1 \cup \Delta_3$, dobivamo međusobno izomorfne komplemente usmjerenih kvazi-jako regularnih grafova s parametrima $\text{QSRD}^C(14, 7, 1, 4; 4, 0)$.

3.3. GRAFOVI KONSTRUIRANI IZ GRUPA A_5 I $U(3,3)$

Za kontrolu algoritma, primjenom teorema 2.3.3 i teorema 2.3.4 konstruiramo (usmjerene) regularne grafove iz tranzitivnih reprezentacija (do na ekvivalenciju) grupe A_5 stupnja n , $n \leq 60$, i grupe $U(3,3)$ stupnja n , $n \leq 112$. Kontrolu algoritma provodimo uspoređujući rezultate navedene u [20] i [56]. Za regularnu tranzitivnu reprezentaciju grupe A_5 stupnja 60 konstruirali smo samo luk-tranzitivne digrafove.

Grupa A_5 ima, do na konjugaciju, devet podgrupa. Provođenjem algoritma opisanog u prethodnom poglavlju dobivamo osam neekvivalentnih tranzitivnih permutacijskih reprezentacija na n točaka, $n \leq 60$: reprezentacije na 5, 6, 10, 12, 15, 20, 30 i 60 točaka.

Struktura podgrupe	Red podgrupe	Indeks podgrupe
$\langle \text{id} \rangle$	1	60
\mathbb{Z}_2	2	30
\mathbb{Z}_3	3	20
$\mathbb{Z}_2 \times \mathbb{Z}_2$	4	15
\mathbb{Z}_5	5	12
S_3	6	10
D_5	10	6
A_4	12	5
A_5	60	1

Tablica 3.2: Predstavnici klasa konjugiranosti podgrupa grupe A_5

Za svaku dobivenu tranzitivnu permutacijsku reprezentaciju grupe A_5 stupnja $n \leq 60$ primjenom teorema 2.3.3 konstruirali smo luk-tranzitivne digrafove. Tablica 3.3 prikazuje, do na izomorfizam, parametre konstruiranih luk-tranzitivnih regularnih digrafova za svaku od navedenih tranzitivnih reprezentacija grupe A_5 .

Napomena 3.3.1. Tranzitivne permutacijske reprezentacije grupe A_5 na 5 i 6 točaka su ranga dva. G_α -orbite za djelovanje grupe A_5 su dijagonala $\{\alpha\}$ i podorbita $\Omega \setminus \{\alpha\}$ pa konstrukcijom iz teorema 2.3.3 dobivamo potpune grafove K_5 i K_6 , respektivno.

Napomena 3.3.2. Tablice u nastavku prikazuju parametre konstruiranih (usmjerenih) regularnih grafova, kao i informaciju o njihovoj grupi automorfizama. Za grupe automorfizama koje nismo mogli odrediti, u tablici smo zapisali kojeg su reda.

n	Parametri	# neizom. grafova	Aut(\mathcal{G}) ili Aut(\mathcal{G})
10	SRG(10,3,0,1)	1	S_5
12	QSRG(12,5,2;2,0)	1	$\mathbb{Z}_2 \times A_5$
15	QSRD(15,1,0,0;1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_3^4 : S_5)$
	QSRG(15,4,1;1,0)	1	S_5
20	QSRD(20,3,0,0;1,0)	1	S_5
	QSRG(20,3,0;1,0)	1	$\mathbb{Z}_2 \times A_5$
30	QSRD(30,2,0,0;1,0)	2	A_5, S_5
	QSRD(30,2,0,0;2,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : (\mathbb{Z}_2^{10} : (\mathbb{Z}_3 \times (\mathbb{Z}_3^4 : S_5))))$
	QSRG(30,2,0;1,0)	1	$\mathbb{Z}_5^6 : ((\mathbb{Z}_2^5 : A_6) : \mathbb{Z}_2^2)$
60	QSRD(60,1,0,0;1,0)	2	$\mathbb{Z}_5 \times (\mathbb{Z}_5^{11} : S_{12}),$ $2^{18} \cdot 3^{28} \cdot 5^4 \cdot 7^2 \cdot 11 \cdot 13 \cdot 17 \cdot 19$

Tablica 3.3: (Usmjereni) luk-tranzitivni grafovi konstruirani iz tranzitivnih permutacijske grupe A_5 stupnja $n \leq 60$

Također, primjenom teorema 2.3.4 konstruirali smo usmjerene regularne grafove, do na izomorfizam, takve da je skup izlaznih susjeda vrha $\alpha \in \Omega$ unija G_α -orbita. Tablice 3.4 i 3.5 prikazuju, do na izomorfizam, parametre konstruiranih usmjerenih regularnih grafova za svaku od navedenih tranzitivnih reprezentacija grupe A_5 stupnja $n \leq 30$.

n	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
10	K_9	1	S_9
12	QSRD(12,10,8;10)	1	$(\mathbb{Z}_2^5 : A_6) : \mathbb{Z}_2^2$
15	SRG(15,6,1,3)	1	S_6
20	DSRG(20,4,0,1,1)	1	S_5
	DSRG(20,7,3,2,4)	2	S_5
	QSRD(20,6,3,2;3,2,1)	2	S_5
	QSRG(20,4,0;2,1,0)	1	$\mathbb{Z}_2 \times A_5$
	QSRG(20,6,1;2,0)	1	$\mathbb{Z}_2 \cdot S_5$
	QSRG(20,6,0;6,2)	1	$\mathbb{Z}_2^4 : ((\mathbb{Z}_2^5 : A_5) : (\mathbb{Z}_2 \times \mathbb{Z}_2))$
	QSRG(20,6,2;2,1,0)	1	$\mathbb{Z}_2 \times S_5$
	QSRG(20,12,6;12,8)	1	$\mathbb{Z}_2^4 : ((\mathbb{Z}_2^5 : A_5) : (\mathbb{Z}_2 \times \mathbb{Z}_2))$

Tablica 3.4: (Usmjereni) regularni grafovi konstruirani iz tranzitivne permutacijske grupe A_5 stupnja $n \leq 20$

n	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
30	DSRG(30,5,0,1,1)	1	S_6
	DSRG(30,9,4,2,5)	2	S_6
	DSRG(30,9,2,3,3)	4	$A_5(2), S_5(2)$
	DSRG(30,10,0,5,5)	1	17915904000000
	DSRG(30,10,2,4,4)	2	A_5
	DSRG(30,11,4,4,5)	3	$A_5(2), S_5$
	DSRG(30,12,3,6,6)	5	$S_5(2), 1209323520(2)$
	DSRG(30,13,5,6,8)	4	$\mathbb{Z}_{15} : \mathbb{Z}_4(2), \mathbb{Z}_5^3 : (A_4 : \mathbb{Z}_4)(2)$
	DSRG(30,13,6,5,11)	2	S_5
	DSRG(30,14,8,5,9)	1	17915904000000
	DSRG(30,14,7,6,8)	5	1209323520(2), 604661760, $A_5(2)$
	DSRG(30,14,6,7,7)	14	$\mathbb{Z}_3^5 : D_5(2), \mathbb{Z}_{15} : \mathbb{Z}_4(4), \mathbb{Z}_5^3 : S_3(2), \mathbb{Z}_5^3 : (A_4 : \mathbb{Z}_4)(4), \mathbb{Z}_3^5 : (\mathbb{Z}_5 : \mathbb{Z}_4)(2)$
	QSRD(30,4,0,0,2,1,0)	4	$A_5(2), S_5(2)$
	QSRD(30,3,1,0,1,0)	2	A_5, S_5
	QSRD(30,4,2,0,2,1,0)	6	A_5
	QSRD(30,4,2,1,2,1,0)	2	S_5
	QSRD(30,4,0,0,1,0)	1	S_6
	QSRD(30,5,3,2,1,0)	2	S_5
	QSRD(30,5,1,0,2,1,0)	1	S_5
	QSRD(30,5,3,0,2,1,0)	2	A_5
	QSRD(30,6,2,1,2,1,0)	4	$A_5(2), S_5(2)$
	QSRD(30,6,2,0,2,1)	2	A_5
	QSRD(30,6,2,0,3,2,1,0)	2	A_5
	QSRD(30,6,4,1,3,2,1,0)	2	A_5
	QSRD(30,6,4,0,2,1,0)	1	$\mathbb{Z}_2 \times A_5$
	QSRD(30,6,2,1,3,2,1,0)	4	A_5
	QSRD(30,6,4,1,4,2,1,0)	1	A_5
	QSRD(30,6,4,0,4,2,0)	2	S_5
	QSRD(30,7,3,2,2,1)	2	A_5
	QSRD(30,7,5,2,3,2,1,0)	2	A_5
	QSRD(30,7,5,0,5,3,2,1,0)	2	S_5
	QSRD(30,8,4,2,6,4,2,1,0)	1	S_5
	QSRD(30,8,4,2,4,3,2,1,0)	2	A_5
	QSRD(30,8,4,2,3,2,1)	2	A_5
	QSRD(30,8,4,3,2,0)	1	S_5
	QSRD(30,8,4,2,4,2,1)	1	A_5
	QSRD(30,8,4,1,4,3,2)	2	S_5
	QSRD(30,8,4,2,5,4,2,1,0)	1	A_5
	QSRD(30,8,4,3,4,2,1)	2	S_6
	QSRD(30,10,8,3,7,4,3,0)	1	A_5
	QSRD(30,10,8,3,5,4,3,2,1,0)	2	A_5
	QSRD(30,10,6,3,5,4,3,2,1)	2	A_5
	QSRD(30,10,8,2,4,0)	1	$\mathbb{Z}_2 \times A_5$
	QSRD(30,10,8,3,5,4,3,2)	2	A_5
	QSRD(30,10,6,3,6,5,4,3,2,1)	2	A_5
	QSRD(30,12,8,4,8,4)	2	S_5
	QSRD(30,12,8,4,8,6,4)	2	S_5
	QSRD(30,12,6,4,6,5)	2	A_5
	QSRD(30,14,6,6,8,7,6)	2	A_5
	QSRD(30,14,8,6,8,6,4)	1	S_5
	QSRD(30,16,12,7,12,11,10,9,8)	1	A_5
	QSRD(30,16,12,8,10,9,8)	1	A_5
	QSRD(30,16,12,8,10,8)	3	A_5
	QSRD(30,18,16,10,12,8)	1	$\mathbb{Z}_2 \times A_5$
	QSRG(30,4,1,1,0)	2	$\mathbb{Z}_2 \times A_5, \mathbb{Z}_2 \times S_5$
	QSRG(30,4,0,1,0)	2	$\mathbb{Z}_2 \times A_5, \mathbb{Z}_2 \times S_5$
	QSRG(30,3,0,1,0)	1	A_5
	QSRG(30,4,0,2,1,0)	1	S_5
	QSRG(30,4,2,4,0)	1	$\mathbb{Z}_2 : (\mathbb{Z}_2^4 : (\mathbb{Z}_2^{10} : (\mathbb{Z}_3^5 : \mathbb{Z}_2 \times \mathbb{Z}_2^4 : S_5)))$
	QSRG(30,5,0,2,1,0)	1	S_5
	QSRG(30,5,0,3,1,0)	2	$\mathbb{Z}_2 \times A_5, \mathbb{Z}_2 \times S_5$
	QSRG(30,6,1,2,1,0)	1	A_5
	QSRG(30,6,0,3,2,1,0)	1	A_5
	QSRG(30,7,0,5,3,2,1,0)	1	A_5
	QSRG(30,8,2,8,2,0)	1	3932160
	QSRG(30,8,1,3,2,0)	1	$\mathbb{Z}_2 \times S_6$
	QSRG(30,8,0,7,3,2,1,0)	1	S_5
	QSRG(30,8,3,2,1,0)	1	$\mathbb{Z}_2 \times S_6$
	QSRG(30,9,0,9,3)	1	7255941120
	QSRG(30,10,3,5,4,3,2,1)	1	A_5
	QSRG(30,12,2,12,6)	1	23592960
	QSRG(30,14,5,10,8,7,6)	1	S_5
	QSRG(30,14,6,12,8,7,6,4)	1	A_5
	QSRG(30,16,7,14,12,10,8)	1	S_5
	QSRG(30,16,8,16,8)	1	23592960
	QSRG(30,16,8,10,9,8,7)	1	S_5
	QSRG(30,18,9,18,12)	1	7255941120
	QSRG(30,20,12,16,15)	1	$S_5 \times S_6$

Tablica 3.5: (Usmjereni) regularni grafovi konstruirani iz tranzitivne permutacijske grupe A_5 stupnja $n = 30$

Grupa $U(3,3)$ ima, do na konjugaciju, 36 podgrupa. Provođenjem algoritma opisanog u prethodnom poglavlju dobivamo 35 neekvivalentnih tranzitivnih permutacijskih reprezentacija na n točaka, $n \leq 6048$: reprezentacije na 28, 36, 56, 112, 189, 224, 288, 336, 672, 864, 3024 i 6048 točaka, po dvije reprezentacije na 63, 126, 504, 1008 i 2016 točaka, kao i po tri reprezentacije na 22, 378, 1512 točaka i četiri reprezentacije na 756 točaka. Za svaku dobivenu tranzitivnu permutacijsku reprezentaciju grupe $U(3,3)$ na n točaka, $n \leq 112$, primjenom teorema 2.3.3 i teorema 2.3.4 konstruirali smo usmjerene regularne grafove.

U tablici 3.6 struktura označena zvjezdicom predstavnik je dviju različitih klasa konjugiranosti grupe $U(3,3)$.

Struktura podgrupe	Red podgrupe	Indeks podgrupe
$\langle id \rangle$	1	6048
\mathbb{Z}_2	2	3024
\mathbb{Z}_3^*	3	2016
$\mathbb{Z}_2 \times \mathbb{Z}_2$	4	1512
\mathbb{Z}_4	4	1512
\mathbb{Z}_6	6	1008
S_3	6	1008
\mathbb{Z}_7	7	864
Q_4	8	756
D_4	8	756
$\mathbb{Z}_4 \times \mathbb{Z}_2$	8	756
\mathbb{Z}_8	8	756
$\mathbb{Z}_3 \times \mathbb{Z}_3$	9	672
A_4	12	504
\mathbb{Z}_{12}	12	504
$\mathbb{Z}_4 \times \mathbb{Z}_4$	16	378
$(\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2$	16	378
$\mathbb{Z}_8 : \mathbb{Z}_2$	16	378
$\mathbb{Z}_3 \times S_3$	18	336
$\mathbb{Z}_7 : \mathbb{Z}_3$	21	288
$SL(2,3)$	24	252
S_4	24	252
$\mathbb{Z}_3 : \mathbb{Z}_8$	24	252
$(\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3$	27	224
$(\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_2$	32	189
$((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$	48	126
$(\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_3$	48	126
$((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2$	54	112
$SL(2,3) : \mathbb{Z}_4$	96	63
$((\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_3) : \mathbb{Z}_2$	96	63
$((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_4$	108	56
$PSL(3,2)$	168	36
$((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_8$	216	28
$PSU(3,3)$	6048	1

Tablica 3.6: Predstavnicima klasa konjugiranosti podgrupa grupe $U(3,3)$

Tablica 3.7 prikazuje, do na izomorfizam, parametre konstruiranih (usmjerenih) regularnih grafova za svaku od navedenih tranzitivnih reprezentacija grupe $U(3,3)$.

n	Parametri	# neizom.	Aut(\mathcal{G})
28	K_{28}	1	S_{28}
36	QSRD(36,7,0,0;1,4)	2	$PSU(3,3)$
56	QSRG(56,27,10;16,0)	1	$\mathbb{Z}_2 \times O(7,2)$
	QSRG(56,27,16;10,0)	1	$\mathbb{Z}_2 \times O(7,2)$
63 (a)	QSRG(63,24,10;9,4)	1	$PSU(3,3) : \mathbb{Z}_2$
63 (b)	QSRD(63,16,0,3;8,7,2)	2	$PSU(3,3)$
	QSRG(63,24,10;9,4)	1	$PSU(3,3) : \mathbb{Z}_2$
	SRG(63,30,13,15)	1	$O(7,2)$
112	QSRD(112, 1, 0, 0; 1, 0)	1	$2^{81} \cdot 3^{13} \cdot 5^6 \cdot 7^4 \cdot 11^2 \cdot 13^2 \cdot 17 \cdot 19 \cdot 23$
	QSRD(112, 27, 0, 8; 8, 2, 0)	1	$\mathbb{Z}_4 \times PSU(3,3)$
	QSRG(112, 27, 2; 8, 0)	1	$PSU(3,3) : D_4$
	QSRG(112, 27, 8; 8, 2, 0)	1	$PSU(3,3) : D_4$
	QSRG(112, 2, 0; 2, 0)	1	$2^{109} \cdot 3^{13} \cdot 5^6 \cdot 7^4 \cdot 11^2 \cdot 13^2 \cdot 17 \cdot 19 \cdot 23$
	QSRG(112, 54, 20; 54, 32, 0)	1	$2^{66} \cdot 3^4 \cdot 5 \cdot 7$
	QSRG(112, 54, 32; 54, 20, 0)	1	$2^{66} \cdot 3^4 \cdot 5 \cdot 7$
	SRG(112, 30, 2, 10)	1	$PSU(4,3) : D_4$

Tablica 3.7: (Usmjereni) regularni grafovi konstruirani iz tranzitivne permutacijske grupe $U(3,3)$ stupnja $n \leq 112$

Dobiveni jako regularni grafovi s parametrima (63,30,13,15) i (112,30,2,10) prikazani su i u članku [20].

4. REZULTATI

Teoremima 2.3.3 i 2.3.4 konstruirali smo usmjerene regularne grafove, no, kako smo u unije podorbite uzimali i međusobno uparene podorbite te samosparene podorbite, konstruirali smo i neusmjerene grafove, stoga i njih navodimo u tablicama.

4.1. GRAFOVI KONSTRUIRANI IZ KATALOGA TRANZITIVNIH GRUPA

Koristeći se GAP-ovim katalogom tranzitivnih permutacijskih grupa, u nastavku su navedeni grafovi i usmjereni grafovi dobiveni konstrukcijom iz teorema 2.3.3 i 2.3.4 na n vrhova, $n \in \{4, \dots, 30\}$, do na izomorfizam grafova. Grafovi su konstruirani iz svih tranzitivnih permutacijskih grupa stupnja n , $n \in \{4, \dots, 21, 23, 25, 26, 27, 29\}$, te iz svih neregularnih tranzitivnih permutacijskih grupa stupnja m , $m \in \{22, 24, 28, 30\}$. U sljedećim tablicama dani su parametri konstruiranih (usmjerenih) regularnih grafova, te informacije o njihovoj grupi automorfizama. Iako promatramo usmjerene regularne grafove, konstrukcijom iz teorema 2.3.3 i 2.3.4 dobili smo i neusmjerene grafove, pa i njih navodimo u tablicama.

Stupanj	Parametri	# neizom.	Aut(\mathcal{G})
4	QSRD(4,1,0,0;1,0)	1	\mathbb{Z}_4
5	QSRD(5,1,0,0;1,0)	1	\mathbb{Z}_5
	SRG(5,2,0,1)	1	D_5
6	DSRG(6,2,0,1,1)	1	S_3
	QSRD(6,1,0,0;1,0)	2	$\mathbb{Z}_6, \mathbb{Z}_3 \times S_3$
	QSRD(6,2,1,0;2,1,0)	2	\mathbb{Z}_6
	QSRD(6,2,0,0;2,0)	1	$\mathbb{Z}_2 \times A_4$
	QSRG(6,2,0;1,0)	1	D_6

Tablica 4.1: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n \in \{4, \dots, 6\}$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
7	QSRD(7,1,0,0;1,0)	1	\mathbb{Z}_7
	QSRD(7,2,0,0;2,1,0)	1	\mathbb{Z}_7
	QSRG(7,2,0;1,0)	1	D_7
	DRT(7,3,1,2)	1	$\mathbb{Z}_7 : \mathbb{Z}_3$
8	DSRG(8,3,1,1,2)	1	D_8
	QSRD(8,1,0,0;1,0)	2	$\mathbb{Z}_8, (\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_2$
	QSRD(8,2,0,0;2,1,0)	2	QD_8, \mathbb{Z}_8
	QSRD(8,2,1,0;1,0)	1	D_4
	QSRD(8,2,0,0;2,0)	1	$(\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2$
	QSRD(8,2,1,0;2,1,0)	2	$\mathbb{Z}_8, \mathbb{Z}_4 \times \mathbb{Z}_2$
	QSRD(8,3,2,0;3,2,0)	2	$(\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_8$
	QSRD(8,3,0,1;3,1)	1	$SL(2, 3)$
	QSRG(8,2,0;2,0)	1	$((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRG(8,2,0;1,0)	1	D_8
	QSRG(8,3,0;2,0)	1	$\mathbb{Z}_2 \times S_4$
QSRG(8,3,0;2,1)	1	D_8	
9	QSRD(9,1,0,0;1,0)	2	$\mathbb{Z}_9, (\mathbb{Z}_3^3 : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(9,2,0,0;2,1,0)	4	$\mathbb{Z}_3 \times S_3(1), \mathbb{Z}_9(3)$
	QSRD(9,3,0,0;3,0)	1	$((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(9,3,2,0;3,2,1,0)	1	\mathbb{Z}_9
	SRG(9,4,1,2)	1	$(S_3 \times S_3) : \mathbb{Z}_2$
	QSRG(9,2,0;1,0)	1	D_9
10	DSRG(10,4,1,2,2)	3	$D_5, \mathbb{Z}_5 : \mathbb{Z}_4(2)$
	QSRD(10,1,0,0;1,0)	2	$\mathbb{Z}_{10}, \mathbb{Z}_5 \times D_5$
	QSRD(10,2,1,0;1,0)	1	D_5
	QSRD(10,2,0,0;2,1,0)	2	\mathbb{Z}_{10}
	QSRD(10,2,1,0;2,1,0)	2	\mathbb{Z}_{10}
	QSRD(10,2,0,0;2,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_5)$
	QSRD(10,2,0,0;1,0)	1	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(10,3,2,1;1,0)	1	D_5
	QSRD(10,3,2,0;2,1,0)	3	D_5, \mathbb{Z}_{10}
	QSRD(10,3,1,0;3,2,1,0)	2	\mathbb{Z}_{10}
	QSRD(10,3,2,0;3,2,1,0)	1	\mathbb{Z}_{10}
	QSRD(10,3,1,0;2,0)	1	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(10,4,3,0;4,3,0)	1	\mathbb{Z}_{10}
	QSRD(10,5,2,2;5,4,2)	2	\mathbb{Z}_{10}
	SRG(10,3,0,1)	1	S_5
	QSRG(10,2,0;1,0)	2	$D_{10}, (\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4$
	QSRG(10,3,0;2,1,0)	2	D_{10}
	QSRG(10,4,0;4,2)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)$
	QSRG(10,4,0;3,0)	1	$\mathbb{Z}_2 \times S_5$
11	QSRD(11,1,0,0;1,0)	1	\mathbb{Z}_{11}
	QSRD(11,2,0,0;2,1,0)	3	\mathbb{Z}_{11}
	QSRD(11,3,0,0;3,2,1,0)	1	\mathbb{Z}_{11}
	QSRD(11,3,2,0;2,1,0)	1	\mathbb{Z}_{11}
	QSRD(11,3,2,0;3,2,1,0)	1	\mathbb{Z}_{11}
	QSRG(11,2,0;1,0)	1	D_{11}
QSRG(11,4,0;3,2,1)	1	D_{11}	
DRT(11,5,2,3)	1	$\mathbb{Z}_{11} : \mathbb{Z}_5$	
12	DSRG(12,3,0,1,1)	1	S_4
	DSRG(12,4,0,2,2)	1	$(\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2$
	DSRG(12,5,2,2,3)	4	$S_4(2), D_6$
	QSRD(12,1,0,0;1,0)	4	$(\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2$, $\mathbb{Z}_{12}, \mathbb{Z}_4 \times ((\mathbb{Z}_2^2 : \mathbb{Z}_3) : \mathbb{Z}_2)$, $\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, $\mathbb{Z}_3 \times ((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(12,2,0,0;2,0)	2	$((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(12,2,0,0;2,1,0)	9	$(\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2$, $\mathbb{Z}_{12}(7), \mathbb{Z}_4 \times S_3$
	QSRD(12,2,0,0;1,0)	4	$\mathbb{Z}_3 : \mathbb{Z}_4(2), S_4, \mathbb{Z}_2 \times A_4$
	QSRD(12,2,1,0;1,0)	3	$D_6, A_4, (S_3 \times S_3) : \mathbb{Z}_2$
	QSRD(12,2,1,0;2,1,0)	4	$\mathbb{Z}_6 \times \mathbb{Z}_2, \mathbb{Z}_{12}, \mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, $\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(12,3,2,0;2,1,0)	14	$(\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2(2), \mathbb{Z}_6 \times \mathbb{Z}_2(2)$, $\mathbb{Z}_4 \times S_3, D_6(3), A_4, \mathbb{Z}_{12}(3), \mathbb{Z}_3 \times D_4(2)$
	QSRD(12,3,1,0;3,2,1,0)	2	$\mathbb{Z}_6 \times \mathbb{Z}_2, \mathbb{Z}_{12}$
	QSRD(12,3,0,0;2,1,0)	3	$A_4 : \mathbb{Z}_4, \mathbb{Z}_4 \times A_4(2)$
	QSRD(12,3,1,0;2,1,0)	4	$\mathbb{Z}_2 \times S_4, \mathbb{Z}_2 \times A_4, \mathbb{Z}_{12}(2)$
	QSRD(12,3,1,0;2,0)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4$
	QSRD(12,3,0,0;3,2,1,0)	2	$\mathbb{Z}_4 \times S_3, \mathbb{Z}_{12}$
	QSRD(12,3,2,1;1,0)	1	D_6
	QSRD(12,3,2,0;3,1,0)	1	$A_4 : \mathbb{Z}_4$
	QSRD(12,3,2,0;3,2,1,0)	1	\mathbb{Z}_{12}
	QSRD(12,3,2,1;2,0)	1	$(S_3 \times S_3) : \mathbb{Z}_2$
	QSRD(12,3,2,0;1,0)	1	D_6
	QSRD(12,3,0,0;3,2,0)	3	$\mathbb{Z}_3 \times D_4, \mathbb{Z}_3 \times S_4, \mathbb{Z}_{12}$
	QSRD(12,3,0,0;3,0)	1	$\mathbb{Z}_3^4 : ((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2)$

Tablica 4.2: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n \in \{7, \dots, 12\}$

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
12	QSRD(12,4,1,1;2,1)	2	A_4
	QSRD(12,4,2,1;2,1)	3	$S_4(2), D_6$
	QSRD(12,4,0,1;4,2,1)	1	$A_4 : Z_4$
	QSRD(12,4,3,0;4,3,2,0)	2	$Z_6 \times Z_2, Z_6 \times S_3$
	QSRD(12,4,2,0;4,2,0)	2	$((Z_2 \times (Z_2^4 : Z_2)) : Z_2) : Z_3,$ $((Z_2 \times (Z_2^4 : Z_2)) : Z_2) : Z_3$
	QSRD(12,4,2,0;4,3,2,0)	4	$(Z_6 \times Z_2) : Z_2, Z_{12}(2),$ $Z_4 \times S_3$
	QSRD(12,4,0,0;4,0)	1	$(((((A_4 \times A_4) : Z_2) \times A_4) : Z_2) :$ $Z_3) : Z_2$
	QSRD(12,4,3,0;3,2,0)	1	D_6
	QSRD(12,4,3,0;4,3,2,1,0)	1	Z_{12}
	QSRD(12,4,3,0;3,1)	1	D_6
	QSRD(12,5,1,2;4,2)	1	$Z_2 \times A_4$
	QSRD(12,5,4,0;5,4,0)	3	$Z_6 \times S_3, Z_4 \times S_4, Z_{12}$
	QSRD(12,5,3,2;4,2,0)	2	$((Z_2 \times (Z_2^4 : Z_2)) : Z_2) : Z_3$
	QSRD(12,5,3,2;4,2,1,0)	2	Z_{12}
	QSRD(12,5,3,2;4,1)	1	$Z_2 \times A_4$
	QSRG(12,2,0;2,0)	1	$((((Z_2 \times Z_2 \times (Z_2^4 : Z_2) : Z_2) :$ $Z_3) : Z_2) : Z_2$
	QSRG(12,2,0;1,0)	2	$Z_3^2 : (Z_2^4 : Z_2), D_{12}$
	QSRG(12,3,0;2,1,0)	3	$Z_2 \times S_4, Z_2 \times Z_2 \times S_3, D_{12}$
	QSRG(12,3,0;3,0)	1	$Z_3^4 : ((Z_2^4 : Z_2) : Z_2) : Z_2$
	QSRG(12,4,0;2,1)	1	$D_4 \times S_3$
	QSRG(12,4,0;4,2,0)	1	$((((Z_2 \times (Z_2^4 : Z_2)) : Z_2) : Z_3) : Z_2$
	QSRG(12,4,0;3,2,0)	2	$Z_2 \times ((S_3 \times S_3) : Z_2), D_{12}$
	QSRG(12,4,1;2,1,0)	1	$Z_2 \times S_4$
	QSRG(12,4,2;4,0)	1	$(((((Z_2 \times Z_2 \times (Z_2^4 : Z_3))$ $: Z_2) : Z_3) : Z_2) : Z_2$
	QSRG(12,5,0;4,0)	1	$Z_2 \times S_6$
	QSRG(12,5,2;2,0)	1	$Z_2 \times A_5$
	QSRG(12,6,2;4,3)	1	$S_4 \times S_3$
13	QSRD(13,1,0,0;1,0)	1	Z_{13}
	QSRD(13,2,0,0;2,1,0)	4	Z_{13}
	QSRD(13,3,0,0;3,2,1,0)	2	Z_{13}
	QSRD(13,3,0,0;2,1,0)	2	$Z_{13}, Z_{13} : Z_3$
	QSRD(13,3,2,0;2,1,0)	2	Z_{13}
	QSRD(13,3,2,0;3,2,1,0)	1	Z_{13}
	QSRD(13,4,2,0;4,3,2,1,0)	1	Z_{13}
	SRG(13,6,2,3)	1	$Z_{13} : Z_6$
	QSRG(13,2,0;1,0)	1	D_{13}
	QSRG(13,4,0;3,2,1,0)	1	D_{13}
	QSRG(13,4,0;2,1)	1	$Z_{13} : Z_4$
14	DSRG(14,6,2,3,3)	3	$D_7, Z_7 : Z_6(2)$
	QSRD(14,1,0,0;1,0)	2	$Z_{14}, Z_7 \times D_7$
	QSRD(14,2,1,0;1,0)	1	D_7
	QSRD(14,2,0,0;2,1,0)	7	$Z_{14}(6), Z_7 \times D_7$
	QSRD(14,2,1,0;2,1,0)	2	Z_{14}
	QSRD(14,2,0,0;2,0)	1	$Z_2 \times (Z_2^6 : Z_7)$
	QSRD(14,3,2,1;1,0)	1	D_7
	QSRD(14,3,2,0;2,1,0)	6	$D_7, Z_{14}(5)$
	QSRD(14,3,1,0;2,1,0)	5	$D_7, Z_{14}(4)$
	QSRD(14,3,2,0;1,0)	1	D_7
	QSRD(14,3,0,0;3,2,1,0)	3	Z_{14}
	QSRD(14,3,0,0;2,1,0)	6	$Z_{14}(5), Z_2 \times (Z_7 : Z_3)$
	QSRD(14,3,2,0;3,2,1,0)	1	Z_{14}
	QSRD(14,3,1,0;3,2,1,0)	2	Z_{14}
	QSRD(14,3,0,1;2,0)	1	$(Z_7 \times Z_7) : (Z_3 \times S_3)$
	QSRD(14,4,2,1;2,1,0)	1	D_7
	QSRD(14,4,2,0;2,1)	1	D_7
	QSRD(14,4,3,0;3,2,1,0)	3	$D_7, Z_{14}(2)$
	QSRD(14,4,1,0;4,3,2,1,0)	2	Z_{14}
	QSRD(14,4,2,0;3,2,1,0)	1	Z_{14}
	QSRD(14,4,2,0;4,3,2,1,0)	1	Z_{14}
	QSRD(14,4,3,0;4,3,2,1,0)	2	Z_{14}
	QSRD(14,4,0,0;4,2,0)	1	$Z_2 \times (Z_2^6 : Z_7)$
	QSRD(14,4,2,0;4,2,1,0)	2	Z_{14}
	QSRD(14,4,1,0;3,2,0)	1	$Z_2 \times (Z_7 : Z_3)$
	QSRD(14,5,3,2;2,1)	1	D_7
	QSRD(14,5,3,0;5,4,3,0)	2	Z_{14}
	QSRD(14,5,4,0;5,4,3,0)	1	Z_{14}
	QSRD(14,6,0,2;4,0)	1	$Z_2 \times (Z_2^6 : (Z_7 : Z_3))$
QSRD(14,6,4,2;6,3,2)	1	Z_{14}	
QSRD(14,6,3,2;4,1,0)	2	Z_{14}	
QSRD(14,6,5,0;6,5,0)	1	Z_{14}	

Tablica 4.3: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n \in \{12, 13, 14\}$

Stupanj	Parametri	# neizom.	Aut(S) ili Aut(S)
14	QSRG(14,2,0;1,0)	2	$D_{14}, (\mathbb{Z}_7 \times \mathbb{Z}_7) : D_4$
	QSRG(14,3,0;2,1,0)	2	D_{14}
	QSRG(14,3,0;1,0)	1	$PSL(3,2) : \mathbb{Z}_2$
	QSRG(14,4,0;4,2,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2$
	QSRG(14,4,0;2,1,0)	1	D_{14}
	QSRG(14,4,0;3,2,1,0)	1	D_{14}
	QSRG(14,4,0;2,0)	1	$PSL(3,2) : \mathbb{Z}_2$
	QSRG(14,5,0;4,3,2,1)	1	D_{14}
	QSRG(14,5,0;4,3,0)	1	D_{14}
	QSRG(14,6,2;4,3,2)	2	D_{14}
QSRG(14,6,0;5,0)	1	$\mathbb{Z}_2 \times S_7$	
15	QSRD(15,1,0,0;1,0)	3	$\mathbb{Z}_{15}, \mathbb{Z}_5 \times (\mathbb{Z}_5^2 : S_3)$ $\mathbb{Z}_3 \times (\mathbb{Z}_3^4 : S_5)$
	QSRD(15,2,0,0;2,1,0)	10	$\mathbb{Z}_{15} (8), \mathbb{Z}_3 \times D_5 (2)$
	QSRD(15,3,0,0;3,2,1,0)	6	$\mathbb{Z}_{15} (5), \mathbb{Z}_3 \times D_5 (1)$
	QSRD(15,3,0,0;2,1,0)	8	$\mathbb{Z}_{15} (6), \mathbb{Z}_5 \times S_3 (2)$
	QSRD(15,3,2,0;2,1,0)	6	$\mathbb{Z}_{15} (5), \mathbb{Z}_3 \times D_5$
	QSRD(15,3,2,0;3,2,1,0)	1	\mathbb{Z}_{15}
	QSRD(15,3,0,0;3,0)	1	$\mathbb{Z}_3^5 : (\mathbb{Z}_2 \times \mathbb{Z}_2^4 : \mathbb{Z}_5)$
	QSRD(15,4,0,1;2,0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(15,4,0,0;4,3,2,1,0)	1	\mathbb{Z}_{15}
	QSRD(15,4,2,0;3,2,1,0)	4	$\mathbb{Z}_{15} (3), \mathbb{Z}_5 \times S_3 (1)$
	QSRD(15,4,2,0;4,3,2,1,0)	1	\mathbb{Z}_{15}
	QSRD(15,4,2,0;4,2,1,0)	4	$\mathbb{Z}_{15} (3), \mathbb{Z}_3 \times D_5 (1)$
	QSRD(15,4,0,0;4,3,0)	2	$\mathbb{Z}_{15}, \mathbb{Z}_3 \times S_5$
	QSRD(15,5,4,0;5,4,3,2,1,0)	1	\mathbb{Z}_{15}
	QSRD(15,5,4,0;4,3,2,1,0)	2	$\mathbb{Z}_{15}, \mathbb{Z}_5 \times S_3$
	QSRD(15,5,0,0;5,0)	1	$A_5^3 : (\mathbb{Z}_2 \times A_4)$
	SRG(15,6,1,3)	1	S_6
	QSRG(15,2,0;1,0)	2	$D_{15}, \mathbb{Z}_5^3 : (\mathbb{Z}_2 \times S_4)$
	QSRG(15,4,0;3,2,1,0)	1	D_{15}
	QSRG(15,4,1;1,0)	1	S_5
QSRG(15,4,0;2,1,0)	2	$S_3 \times D_5, D_{15}$	
QSRG(15,6,2;3,2,1)	1	$S_3 \times D_5$	
QSRG(15,6,0;6,3)	1	$\mathbb{Z}_3^5 : (\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)$	
QSRG(15,8,3;6,4)	1	$S_5 \times S_3$	
16	DSRG(16,7,4,2,5)	1	$((((\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$
	DSRG(16,7,3,3,4)	3	$D_8, GL(2,3) (2)$
	DSRG(16,8,3,5,5)	3	$D_8, GL(2,3) (2)$
	QSRD(16,1,0,0;1,0)	3	$(((((\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_8) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_2, \mathbb{Z}_8 \times \mathbb{Z}_8) : \mathbb{Z}_2$
	QSRD(16,2,1,0;2,1,0)	4	$(\mathbb{Z}_8 \times \mathbb{Z}_8) : \mathbb{Z}_2, \mathbb{Z}_8 \times \mathbb{Z}_2, \mathbb{Z}_{16}, (\mathbb{Z}_4 \times \mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(16,2,1,0;1,0)	6	$QD_8 (2), \mathbb{Z}_8 : \mathbb{Z}_2, (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2, ((\mathbb{Z}_2^4) : \mathbb{Z}_2) : \mathbb{Z}_2, D_8$
	QSRD(16,2,0,0;2,0)	2	$((((\mathbb{Z}_2^3) : \mathbb{Z}_4) : \mathbb{Z}_2) \times ((\mathbb{Z}_2^3) : \mathbb{Z}_4) : \mathbb{Z}_2) : \mathbb{Z}_2, ((((((\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(16,2,0,0;1,0)	5	$QD_8 (2), ((\mathbb{Z}_2^3) : \mathbb{Z}_4) : \mathbb{Z}_2, \mathbb{Z}_8 : \mathbb{Z}_2, \mathbb{Z}_4 : \mathbb{Z}_4$
	QSRD(16,2,0,0;2,1,0)	13	$(\mathbb{Z}_4 \times \mathbb{Z}_2), (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_2, (\mathbb{Z}_8 \times \mathbb{Z}_8) : \mathbb{Z}_2, \mathbb{Z}_{16} (7), \mathbb{Z}_8 \times \mathbb{Z}_2, (\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_2, (\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2, QD_{16}$
	QSRD(16,3,2,1;1,0)	2	$((((\mathbb{Z}_2^4) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2, D_8$
	QSRD(16,3,2,0;3,2,0)	2	$((((\mathbb{Z}_4 \times \mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2, (\mathbb{Z}_8 \times \mathbb{Z}_8) : \mathbb{Z}_2$
	QSRD(16,3,2,0;2,1,0)	23	$(\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2 (3), (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2 (3), QD_8 (2), (\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_8 \times \mathbb{Z}_2 (2), \mathbb{Z}_4 \times D_4, \mathbb{Z}_8 : \mathbb{Z}_2 (2), D_8 (2), \mathbb{Z}_2 \times D_4, \mathbb{Z}_{16} (6)$
	QSRD(16,6,2,0;3,1,0)	1	$((((\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$

Tablica 4.4: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n \in \{14, 15, 16\}$

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
16	QSRD(16,3,1,0;3,1,0)	1	$\mathbb{Z}_8 : \mathbb{Z}_2$
	QSRD(16,3,2,0;1,0)	3	$D_8(2), \mathbb{Z}_8 : \mathbb{Z}_2^2$
	QSRD(16,3,1,0;2,1,0)	22	$\mathbb{Z}_2 \times QD_8, \mathbb{Z}_{16}(4),$ $(\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_2,$ $(\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2(2), \mathbb{Z}_8 : \mathbb{Z}_2^2,$ $((\mathbb{Z}_2^3) : \mathbb{Z}_4) : \mathbb{Z}_2 : \mathbb{Z}_2(2), \mathbb{Z}_8 \times \mathbb{Z}_2(2),$ $\mathbb{Z}_8 : \mathbb{Z}_2(2), QD_8(3), (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2(2),$ $\mathbb{Z}_4 : \mathbb{Z}_4, D_8$
	QSRD(16,3,2,1;2,0)	2	$\mathbb{Z}_2 \times ((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(16,3,0,0;2,1,0)	22	$\mathbb{Z}_2 \times QD_8, \mathbb{Z}_{16}(4),$ $(\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_2,$ $(\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2(2), \mathbb{Z}_8 : \mathbb{Z}_2^2,$ $((\mathbb{Z}_2^3) : \mathbb{Z}_4) : \mathbb{Z}_2 : \mathbb{Z}_2(2), \mathbb{Z}_8 \times \mathbb{Z}_2(2),$ $\mathbb{Z}_8 : \mathbb{Z}_2(2), QD_8(3), (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2(2),$ $\mathbb{Z}_4 : \mathbb{Z}_4, D_8$
	QSRD(16,3,0,0;3,2,0)	3	$\mathbb{Z}_4 \times S_4, \mathbb{Z}_{16},$ $(\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(16,3,0,0;3,2,1,0)	7	$(\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_{16}(16),$ $(\mathbb{Z}_2 \times Q_4) : \mathbb{Z}_2, \mathbb{Z}_4, D_4 = \mathbb{Z}_4, (\mathbb{Z}_4 \times \mathbb{Z}_2)$
	QSRD(16,3,0,1;3,1,0)	1	$((Q_4 \times Q_4) : \mathbb{Z}_3) : \mathbb{Z}_2 : \mathbb{Z}_3$
	QSRD(16,3,0,0;3,1,0)	2	$GL(2,3) : \mathbb{Z}_2, Q_8$
	QSRD(16,3,2,0;3,2,1,0)	1	\mathbb{Z}_{16}
	QSRD(16,4,3,1;3,0)	1	$((\mathbb{Z}_2^4) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(16,4,2,1;2,1,0)	1	D_8
	QSRD(16,4,2,0;4,2,1,0)	11	$(\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2,$ $(\mathbb{Z}_8 : \mathbb{Z}_2^2) : \mathbb{Z}_2,$ $(\mathbb{Z}_2 \times Q_4) : \mathbb{Z}_2, (\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_2,$ $\mathbb{Z}_8 : \mathbb{Z}_2, \mathbb{Z}_4 : \mathbb{Z}_4, \mathbb{Z}_{16}(4), QD_{16}$
	QSRD(16,4,2,0;4,2,0)	5	$((\mathbb{Z}_2^4) : \mathbb{Z}_2) : \mathbb{Z}_2,$ $(\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2,$ $(((((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2,$ $(((((\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2,$ $: \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2,$ $\mathbb{Z}_8 \times \mathbb{Z}_2$
	QSRD(16,4,3,0;2,1,0)	9	$(\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2, D_8(2), QD_8,$ $\mathbb{Z}_4 \times S_4, \mathbb{Z}_{16}, \mathbb{Z}_8 \times \mathbb{Z}_2(2), \mathbb{Z}_8 : \mathbb{Z}_2$
	QSRD(16,4,3,0;3,1,0)	3	$(\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3,$ $D_8, \mathbb{Z}_2 \times D_4$
	QSRD(16,4,3,0;3,2,0)	4	$\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2),$ $\mathbb{Z}_8 \times \mathbb{Z}_2(2), (\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_2$
	QSRD(16,4,3,0;3,2,1,0)	21	$(\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2(3),$ $(\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2,$ $(\mathbb{Z}_2^3) : \mathbb{Z}_2^2, \mathbb{Z}_8 : \mathbb{Z}_2^2, QD_8(5),$ $\mathbb{Z}_8 : \mathbb{Z}_2(3), \mathbb{Z}_{16}(2),$ $(\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_2,$ $(\mathbb{Z}_2^3) : \mathbb{Z}_4(2), D_8(2)$
	QSRD(16,4,2,0;3,2,0)	8	$((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_8 \times \mathbb{Z}_2(3),$ $\mathbb{Z}_{16}(3), \mathbb{Z}_4 \times \mathbb{Z}_4$
	QSRD(16,4,1,0;4,3,2,1,0)	2	$\mathbb{Z}_8 \times \mathbb{Z}_2, \mathbb{Z}_{16}$
	QSRD(16,4,1,0;3,2,1,0)	3	$\mathbb{Z}_8 : \mathbb{Z}_2, (\mathbb{Z}_2^3) : \mathbb{Z}_4(2)$
	QSRD(16,4,2,0;2,1)	1	D_8
	QSRD(16,4,2,0;3,2,1,0)	17	$\mathbb{Z}_8 : \mathbb{Z}_2(3), (\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2(2),$ $QD_8(3), (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2, Q_8(2),$ $\mathbb{Z}_4 : \mathbb{Z}_4(2), \mathbb{Z}_{16}(4)$
	QSRD(16,4,1,0;4,2,1,0)	4	$\mathbb{Z}_2 \times (\mathbb{Z}_8 : \mathbb{Z}_2),$ $(\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2,$ $(\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_2, \mathbb{Z}_{16}$
	QSRD(16,4,3,0;4,3,2,1,0)	2	$\mathbb{Z}_{16}, \mathbb{Z}_8 \times \mathbb{Z}_2$
	QSRD(16,4,2,0;2,0)	2	$\mathbb{Z}_8 : \mathbb{Z}_2^2,$ $(((\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(16,4,1,0;3,1,0)	2	$(\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_2 \times SL(2,3)$
	QSRD(16,4,0,0;4,2,0)	3	$(((((\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2,$ $: \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2,$ $(((\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2,$ $: \mathbb{Z}_3) : \mathbb{Z}_2,$ $(((((\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2,$ $: \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(16,4,0,0;4,0)	1	1327104
	SRG(16,5,0,2)	1	$\mathbb{Z}_2^4 : S_5$
	SRG(16,6,2,2)	2	$(S_4 \times S_4) : \mathbb{Z}_2, ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2$

Tablica 4.5: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 16$

Stupanj	Parametri	# neizom.	Aut(S) ili Aut(S)
16	QSRG(16,2,0;2,0)	1	$(((((Z_4 \times Z_4 \times Z_2 \times Z_2) : Z_4) : Z_2) : Z_2) : Z_2) : Z_2) : Z_3$ $: Z_2) : Z_2$
	QSRG(16,2,0;1,0)	2	$(((((Z_2^4) : Z_2) : Z_2) : Z_2) : Z_2) : Z_2, D_{16}$ $: Z_2$
	QSRG(16,3,0;2,0)	1	$(Z_2 \times ((S_4 \times S_4) : Z_2)) : Z_2$
	QSRG(16,3,0;2,1,0)	4	$Z_2 \times D_8,$ $(((((Z_2^4) : Z_2) : Z_2) : Z_2) : Z_2) : Z_2,$ $(D_4 \times D_4) : Z_2, D_{16}$
	QSRG(16,3,0;1,0)	1	$GL(2, 3) : Z_2$
	QSRG(16,4,0;4,0)	1	2654208
	QSRG(16,4,0;2,0)	1	$((((Z_2^3) : Z_2^2) : Z_3) : Z_2) : Z_2$
	QSRG(16,4,0;2,1,0)	8	$(Z_2^4) : Z_2, D_8, Z_2 \times D_8,$ $((Z_8 \times Z_2) : Z_2) : Z_2,$ $D_{16} (2), GL(2, 3) : Z_2, (Z_2^3) : Z_4$
	QSRG(16,4,0;3,2,1,0)	1	D_{16}
	QSRG(16,4,0;4,2,0)	1	$(((((Z_8 \times Z_2) : Z_2) : Z_2) : Z_2) : Z_2) : Z_2) : Z_2$
17	QSRD(17,1,0,0;1,0)	1	Z_{17}
	QSRD(17,2,0,0;2,1,0)	6	Z_{17}
	QSRD(17,3,0,0;3,2,1,0)	4	Z_{17}
	QSRD(17,3,0,0;2,1,0)	8	Z_{17}
	QSRD(17,3,2,0;2,1,0)	4	Z_{17}
	QSRD(17,3,2,0;3,2,1,0)	1	Z_{17}
	QSRD(17,4,0,0;3,2,1,0)	1	Z_{17}
	QSRD(17,4,0,0;4,3,2,1,0)	2	Z_{17}
	QSRD(17,4,2,0;3,2,1,0)	6	Z_{17}
	QSRD(17,4,2,0;4,3,2,1,0)	1	Z_{17}
	QSRD(17,4,0,0;4,2,1,0)	1	Z_{17}
	QSRD(17,4,2,0;4,2,1,0)	2	Z_{17}
	QSRD(17,5,2,0;5,4,3,2,1,0)	1	Z_{17}
	QSRD(17,5,4,0;4,3,2,1,0)	2	Z_{17}
	QSRD(17,5,4,0;5,4,3,2,1,0)	1	Z_{17}
	SRG(17,8,3,4)	1	$Z_{17} : Z_8$
	QSRG(17,2,0;1,0)	1	D_{17}
QSRG(17,4,0;3,2,1,0)	1	D_{17}	
QSRG(17,4,0;2,1,0)	2	D_{17}	
QSRG(17,6,2;3,2,1)	1	D_{17}	
QSRG(17,6,0;5,4,3,2,1)	1	D_{17}	
18	DSRG(18,4,0,1,3)	1	$(Z_3^2 : Z_3) : Z_2^2$
	DSRG(18,5,2,1,3)	2	$(S_3 \times S_3) : Z_2$
	DSRG(18,6,0,3,3)	1	$(((((Z_3^3 : Z_2^2) \times (Z_3^3 : Z_2^2)) : Z_3) : Z_2) : Z_2) : Z_2$
	DSRG(18,7,2,3,5)	4	$Z_3^2 : Z_4, S_3 \times S_3$
	DSRG(18,8,7,0,8)	1	263363788800
	DSRG(18,8,4,3,5)	1	$(((((Z_3^3 : Z_2^2) \times (Z_3^3 : Z_2^2)) : Z_3) : Z_2) : Z_2) : Z_2$
	DSRG(18,8,3,4,4)	8	$D_9 (3), (Z_3^3 : Z_3) : Z_2 (2)$ $Z_3^2 : QD_8 (2), Z_3^2 : Z_4$
	QSRD(18,1,0,0;1,0)	4	$Z_2 \times ((Z_2^3 : (Z_3^3 : Z_3)) : Z_2),$ $Z_9 \times D_9, Z_{18}, 524880$
	QSRD(18,2,1,0;2,1,0)	4	$Z_2 \times ((Z_2^2 : (Z_3^3 : Z_3)) : Z_2) (2)$ $Z_{18} (2)$
	QSRD(18,2,1,0;1,0)	4	$D_9, (((Z_3^3 : Z_2^2) : Z_3) : Z_2) : Z_2,$ $Z_3 \times S_3 (2)$
	QSRD(18,2,0,0;2,1,0)	18	$Z_3 \times (Z_3^3 : D_4, Z_9 \times D_9 (3),$ $Z_{18} (12), Z_6 \times Z_3, Z_6 \times S_3$
	QSRD(18,2,0,0;2,0)	2	$Z_2 \times ((Z_2^8 : (Z_3^3 : Z_3)) : Z_2),$ $Z_2 \times (Z_2^8 : Z_9)$
	QSRD(18,2,0,0;1,0)	4	$Z_3 \times S_3 (2), (S_3 \times S_3) : Z_2 (2)$
	QSRD(18,3,2,1;1,0)	1	D_9
	QSRD(18,3,2,1;2,0)	1	$((((Z_3^3 : Z_2^2) : Z_3) : Z_2) : Z_2$
	QSRD(18,3,1,0;3,2,1,0)	2	Z_{18}
	QSRD(18,3,1,0;2,1,0)	29	$Z_{18} (12), D_9 (3), Z_6 \times S_3 (2),$ $Z_6 \times Z_3, Z_3 \times S_3 (10), S_3 \times S_3$
	QSRD(18,3,2,0;2,1,0)	16	$D_9, Z_{18} (10), Z_3 \times S_3 (3), Z_6 \times S_3 (2)$
	QSRD(18,3,2,0;1,0)	5	$D_9 (3), S_3 \times S_3, Z_3 \times S_3$
	QSRD(18,3,1,0;1,0)	3	$Z_3 \times S_3 (2), (S_3 \times S_3) : Z_2$
QSRD(18,3,2,0;3,2,1,0)	2	$Z_9 \times D_9, D_9$	
QSRD(18,3,0,0;3,0)	2	$((Z_3 \times Z_3 \times Z_3 \times Z_3 \times Z_3 \times Z_3) : ((Z_2 \times (Z_2^4 : Z_2)) : Z_2)) : Z_3,$ 839808	
QSRD(18,3,1,0;3,1,0)	1	$Z_3 \times S_3$	
QSRD(18,3,0,0;2,1,0)	41	$Z_6 \times A_4 (2), Z_2 \times (Z_2^2 : Z_9) (4),$ $Z_{18} (24), Z_6 \times S_3 (2), Z_6 \times Z_3,$ $Z_3 \times S_3 (8)$	

Tablica 4.6: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n \in \{16, 17, 18\}$

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
18	QSRD(18,3,0,0;3,2,1,0)	10	$\mathbb{Z}_{18} (8), \mathbb{Z}_6 \times S_3 (2)$
	QSRD(18,3,0,0;3,1,0)	2	$\mathbb{Z}_3 \times S_3, (\mathbb{Z}_3^2 : \mathbb{Z}_3) : \mathbb{Z}_4$
	QSRD(18,4,2,1;2,1,0)	3	$D_9, (S_3 \times S_3) : \mathbb{Z}_2 (2)$
	QSRD(18,4,1,0;4,3,2,1,0)	2	\mathbb{Z}_{18}
	QSRD(18,4,1,0;4,2,1,0)	12	$\mathbb{Z}_{18} (8), \mathbb{Z}_6 \times S_3 (2), \mathbb{Z}_3 \times S_3,$ $\mathbb{Z}_6 \times \mathbb{Z}_3$
	QSRD(18,4,2,0;3,2,1,0)	27	$\mathbb{Z}_3 \times S_3 (5), S_3 \times S_3 (2), D_9 (2),$ $\mathbb{Z}_{18} (16), \mathbb{Z}_6 \times S_3 (2)$
	QSRD(18,4,2,0;2,1,0)	10	$S_3 \times S_3, \mathbb{Z}_2 \times A_4 \times S_3, D_9 (4), \mathbb{Z}_{18} (2),$ $\mathbb{Z}_3 \times S_3, \mathbb{Z}_2 \times (\mathbb{Z}_2^2 : \mathbb{Z}_9)$
	QSRD(18,4,3,0;2,1,0)	7	$D_9 (3), \mathbb{Z}_{18} (2), \mathbb{Z}_3 \times S_3,$ $(\mathbb{Z}_3^2 : \mathbb{Z}_3) : \mathbb{Z}_4$
	QSRD(18,4,1,0;3,2,1,0)	15	$\mathbb{Z}_{18} (8), \mathbb{Z}_6 \times S_3 (2), \mathbb{Z}_3 \times S_3 (5)$
	QSRD(18,4,2,0;4,2,1,0)	10	$\mathbb{Z}_6 \times S_3 (2), \mathbb{Z}_{18} (8)$
	QSRD(18,4,3,0;3,2,1,0)	11	$D_9 (2), \mathbb{Z}_{18} (5), \mathbb{Z}_3 \times ((S_3 \times S_3) : \mathbb{Z}_2),$ $\mathbb{Z}_6 \times S_3, \mathbb{Z}_9 \times S_3, \mathbb{Z}_3 \times S_3$
	QSRD(18,4,1,0;3,2,0)	2	$\mathbb{Z}_2 \times (((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2)$
	QSRD(18,4,3,0;4,3,2,1,0)	2	\mathbb{Z}_{18}
	QSRD(18,4,3,0;3,1,0)	2	$\mathbb{Z}_3^3 : D_4, \mathbb{Z}_3 \times D_9$
	QSRD(18,4,1,0;3,1,0)	1	$((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2 : \mathbb{Z}_2$
	QSRD(18,4,1,0;2,1,0)	3	$\mathbb{Z}_3 \times S_3$
	QSRD(18,4,0,0;4,3,2,0)	7	$\mathbb{Z}_3 \times ((S_3 \times S_3) : \mathbb{Z}_2), \mathbb{Z}_6 \times S_3 (2),$ $\mathbb{Z}_9 \times S_3, \mathbb{Z}_{18} (3)$
	QSRD(18,4,0,0;4,2,1,0)	4	$(\mathbb{Z}_3^2 : \mathbb{Z}_3) : \mathbb{Z}_4, \mathbb{Z}_{18} (3)$
	QSRD(18,4,1,1;2,1,0)	2	$\mathbb{Z}_3 \times S_3$
	QSRD(18,4,3,0;4,3,1,0)	1	$(\mathbb{Z}_3^3 : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(18,4,0,0;4,2,0)	4	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^8 : \mathbb{Z}_3^2) : \mathbb{Z}_2),$ $\mathbb{Z}_2 \times (\mathbb{Z}_2^8 : \mathbb{Z}_9) (3)$
	QSRD(18,4,0,0;4,3,2,1,0)	4	$\mathbb{Z}_{18} (3), \mathbb{Z}_3 \times S_3$
	QSRD(18,4,0,0;3,2,1,0)	5	$\mathbb{Z}_2 \times (\mathbb{Z}_3^3 : \mathbb{Z}_3) (2), \mathbb{Z}_{18} (3)$
	QSRD(18,4,2,0;4,3,2,1,0)	1	\mathbb{Z}_{18}
	QSRD(18,4,0,0;2,0)	1	$\mathbb{Z}_3^2 : QD_8$
	QSRD(18,4,0,0;3,1,0)	1	$(\mathbb{Z}_3^3 : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(18,4,0,0;3,2,0)	1	$\mathbb{Z}_3 \times S_3$
	QSRD(18,5,3,2;2,1,0)	1	D_9
	QSRD(18,5,2,1;4,3,2,1,0)	2	$\mathbb{Z}_3 \times S_3$
	QSRD(18,5,4,1;2,0)	1	$S_3 \times S_3$
	QSRD(18,5,4,1;2,1,0)	2	$\mathbb{Z}_3 \times S_3, D_9$
	QSRD(18,5,2,1;3,2,1,0)	10	$\mathbb{Z}_3 \times S_3$
	QSRD(18,5,2,1;2,1,0)	1	D_9
	QSRD(18,5,2,1;4,2,1,0)	1	$\mathbb{Z}_3 \times S_3$
	QSRD(18,5,1,0;5,4,3,2,1,0)	2	\mathbb{Z}_{18}
	QSRD(18,5,1,0;4,3,2,1,0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_3^3 : \mathbb{Z}_3)$
	QSRD(18,5,4,0;4,3,2,1,0)	9	$D_9 (2), \mathbb{Z}_{18} (6), \mathbb{Z}_6 \times S_3$
	QSRD(18,5,3,0;5,3,2,1,0)	2	$\mathbb{Z}_3 \times S_3 \times S_3, \mathbb{Z}_{18}$
	QSRD(18,5,3,0;4,3,2,1,0)	12	$\mathbb{Z}_{18} (8), D_9, \mathbb{Z}_3 \times ((S_3 \times S_3) : \mathbb{Z}_2),$ $\mathbb{Z}_6 \times S_3, \mathbb{Z}_9 \times S_3$
	QSRD(18,5,3,0;5,4,3,2,1,0)	2	\mathbb{Z}_{18}
	QSRD(18,5,2,0;4,3,1,0)	2	$\mathbb{Z}_2 \times (((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2)$
	QSRD(18,2,0;3,2,1,0)	1	$((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2 : \mathbb{Z}_2$
	QSRD(18,5,3,0;3,2,1,0)	3	$D_9, \mathbb{Z}_3^3 : D_4, \mathbb{Z}_3 \times D_9$
	QSRD(18,5,3,0;4,3,2,0)	3	$S_3 \times S_3, \mathbb{Z}_3 \times S_3 (2)$
	QSRD(18,5,4,0;3,2,0)	1	$\mathbb{Z}_3 \times S_3$
	QSRD(18,5,4,0;4,3,2,0)	1	$\mathbb{Z}_3 \times S_3$
	QSRD(18,5,2,0;4,3,2,0)	1	$\mathbb{Z}_3 \times S_3$
	QSRD(18,5,4,0;3,2,1,0)	1	D_9
	QSRD(18,5,2,0;5,3,2,0)	3	$\mathbb{Z}_6 \times S_3, \mathbb{Z}_{18} (2)$
	QSRD(18,5,4,0;5,4,2,0)	1	$(\mathbb{Z}_3^3 : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(18,5,1,1;3,2,1)	6	$\mathbb{Z}_3 \times S_3$
	QSRD(18,5,1,0;4,3,2,0)	1	\mathbb{Z}_{18}
	QSRD(18,5,3,0;5,3,2,0)	3	$\mathbb{Z}_{18} (2), \mathbb{Z}_6 \times S_3$
	QSRD(18,5,1,0;3,0)	1	$\mathbb{Z}_3^2 : QD_8$
	QSRD(18,5,1,0;3,2,1,0)	1	$(\mathbb{Z}_3^3 : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(18,5,0,0;5,4,0)	4	$\mathbb{Z}_3 \times S_6, \mathbb{Z}_6 \times S_4, \mathbb{Z}_9 \times S_3, \mathbb{Z}_{18}$
	QSRD(18,5,1,1;3,2,1,0)	2	$\mathbb{Z}_3 \times S_3$
	QSRD(18,5,2,0;4,2,1,0)	2	\mathbb{Z}_{18}
	QSRD(18,5,4,0;4,2,1,0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_2^2 : \mathbb{Z}_9)$
	QSRD(18,5,2,0;5,4,2,0)	2	\mathbb{Z}_{18}
	QSRD(18,5,2,0;5,4,3,2,1,0)	1	\mathbb{Z}_{18}
	QSRD(18,5,2,0;4,3,2,1,0)	2	\mathbb{Z}_{18}
	QSRD(18,5,4,0;5,4,3,2,1,0)	1	\mathbb{Z}_{18}

Tablica 4.7: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 18$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
18	QSRD(18, 6, 4, 2; 3, 2, 1, 0)	1	$S_3 \times S_3$
	QSRD(18, 6, 3, 2; 3, 2, 1)	1	D_9
	QSRD(18, 6, 4, 2; 4, 3, 2, 1, 0)	3	$Z_3 \times S_3$
	QSRD(18, 6, 4, 2; 4, 2, 1)	3	$S_3 \times S_3, D_9, Z_3 \times S_3$
	QSRD(18, 6, 4, 2; 4, 2, 1, 0)	7	$Z_6 \times S_3 (3), Z_{18} (4)$
	QSRD(18, 6, 4, 1; 4, 2)	1	$S_3 \times S_3$
	QSRD(18, 6, 3, 2; 4, 2, 1, 0)	2	Z_{18}
	QSRD(18, 6, 4, 2; 3, 2, 1)	2	D_9
	QSRD(18, 6, 4, 2; 4, 3, 2, 0)	1	$Z_3 \times S_3$
	QSRD(18, 6, 4, 1; 3, 2)	1	D_9
	QSRD(18, 6, 3, 2; 5, 4, 2, 1, 0)	2	Z_{18}
	QSRD(18, 6, 3, 0; 6, 3, 0)	2	$((((Z_3^3 : Z_2^2) \times (Z_3^3 : Z_2^2)) : Z_3) : Z_2) : Z_2$
	QSRD(18, 6, 5, 0; 3, 2, 1, 5, 4, 0, 6)	1	Z_{18}
	QSRD(18, 6, 5, 0; 5, 3, 1)	1	D_9
	QSRD(18, 6, 3, 0; 5, 4, 3, 0)	4	$Z_6 \times S_3, Z_{18} (3)$
	QSRD(18, 6, 4, 0; 5, 4, 3, 0)	5	$Z_6 \times S_3, Z_3 \times S_3, Z_{18} (3)$
	QSRD(18, 6, 4, 0; 4, 0)	1	$(S_3 \times S_3) : Z_2$
	QSRD(18, 6, 5, 0; 5, 4, 3, 0)	6	$Z_3 \times S_3 (2), Z_{18} (3), Z_6 \times S_3$
	QSRD(18, 6, 4, 0; 6, 4, 3, 0)	1	$Z_3 \times S_3$
	QSRD(18, 6, 1, 1; 4, 1)	2	$Z_3 \times S_3$
	QSRD(18, 6, 3, 0; 6, 5, 4, 3, 0)	2	Z_{18}
	QSRD(18, 6, 5, 0; 6, 5, 4, 3, 0)	1	Z_{18}
	QSRD(18, 6, 0, 0; 6, 0)	1	1119744000
	QSRD(18, 6, 3, 2; 4, 3, 2, 1, 0)	1	$Z_3 \times S_3$
	QSRD(18, 6, 1, 2; 5, 4, 2, 0)	1	$Z_3 \times S_3$
	QSRD(18, 6, 4, 2; 6, 2, 1, 0)	1	Z_{18}
	QSRD(18, 6, 4, 0; 6, 4, 2, 0)	1	$Z_2 \times (Z_2^8 : Z_9)$
	QSRD(18, 6, 4, 0; 6, 5, 4, 3, 0)	1	Z_{18}
	QSRD(18, 6, 3, 0; 6, 4, 3, 0)	1	$(Z_3^2 : Z_3) : Z_4$
	QSRD(18, 7, 4, 3; 3, 2)	1	D_9
	QSRD(18, 7, 4, 2; 5, 4, 3, 2, 1)	2	$Z_3 \times S_3$
	QSRD(18, 7, 4, 2; 4, 3, 2, 1)	1	D_9
	QSRD(18, 7, 5, 0; 7, 6, 5, 0)	5	$Z_6 \times S_3, Z_{18} (4)$
	QSRD(18, 7, 5, 0; 6, 5, 0)	1	$(S_3 \times S_3) : Z_2$
	QSRD(18, 7, 6, 0; 6, 5, 0)	1	$Z_3 \times S_3$
	QSRD(18, 7, 6, 0; 7, 6, 5, 0)	2	$Z_2 \times ((Z_3^3 : Z_3) : Z_2), Z_{18}$
	QSRD(18, 7, 2, 2; 6, 4, 2, 1, 0)	2	Z_{18}
	QSRD(18, 7, 0, 2; 6, 5, 4, 2, 0)	2	Z_{18}
	QSRD(18, 7, 4, 2; 6, 5, 4, 2, 0)	1	$Z_3 \times S_3$
	QSRD(18, 7, 6, 2; 4, 3, 2, 1)	1	$Z_3 \times S_3$
	QSRD(18, 8, 5, 4; 6, 3, 0)	2	$((((Z_3^3 : Z_2^2) \times (Z_3^3 : Z_2^2)) : Z_3) : Z_2) : Z_2$
	QSRD(18, 8, 5, 4; 6, 2, 1, 0)	6	$Z_6 \times A_4 (2), Z_{18} (4)$
	QSRD(18, 8, 5, 4; 6, 2, 1)	2	$Z_3 \times S_3$
	QSRD(18, 8, 6, 3; 6, 4, 2)	1	$S_3 \times S_3$
	QSRD(18, 8, 5, 4; 3, 2, 1, 0, 6)	4	$Z_6 \times S_3 (2), Z_{18} (2)$
	QSRD(18, 8, 4, 3; 5, 4, 3)	2	$(Z_3^3 : Z_3) : Z_2, (Z_3^3 : Z_3) : Z_2$
	QSRD(18, 8, 6, 3; 6, 3, 2)	1	D_9
	QSRD(18, 8, 7, 0; 8, 7, 0)	2	$Z_2 \times ((Z_3^3 : Z_3) : Z_2), Z_{18}$
	QSRD(18, 8, 3, 3; 5, 4, 3)	2	$(Z_3^3 : Z_3) : Z_2, (Z_3^3 : Z_3) : Z_2$
	QSRD(18, 9, 4, 4; 9, 8, 4)	2	$Z_6 \times S_4$
	QSRD(18, 9, 4, 4; 7, 4)	2	$Z_3 \times S_3$
	QSRD(18, 9, 7, 4; 7, 4)	2	$Z_3^2 : Z_4, S_3 \times S_3$
	QSRD(18, 9, 4, 4; 9, 6, 4)	1	$Z_3 \times S_3$
	QSRD(18, 9, 2, 4; 8, 6, 5, 4, 2)	2	Z_{18}
	QSRD(18, 9, 6, 4; 9, 6, 4)	1	$(Z_3^2 : Z_3) : Z_4$
	QSRD(18, 11, 8, 6; 9, 8, 7)	1	$Z_3^2 : Z_2$
	QSRG(18, 2, 0; 1, 0)	3	$D_{18},$ $((((Z_2 \times Z_2 \times (Z_3^3 : Z_2^2)) : Z_3) : Z_2) : Z_2), (Z_9 \times Z_9) : D_4$
	QSRG(18, 3, 0; 3, 0)	1	2239488
	QSRG(18, 3, 0; 2, 1, 0)	2	D_{18}
	QSRG(18, 3, 0; 1, 0)	2	$D_9, (Z_3^2 : Z_3) : D_4$
	QSRG(18, 4, 1; 2, 0)	1	$Z_3^4 : ((Z_2^4 : Z_2) : Z_2) : Z_2$
	QSRG(18, 4, 2; 4, 0)	1	663552
	QSRG(18, 4, 0; 3, 2, 1, 0)	1	D_{18}
	QSRG(18, 4, 0; 2, 1, 0)	5	$D_9, D_{18} (3), Z_2 \times ((S_3 \times S_3) : Z_2)$
	QSRG(18, 4, 0; 3, 1, 0)	1	$((((Z_3^3 : Z_2^2) : Z_3) : Z_2) : Z_2)$
	QSRG(18, 4, 0; 4, 2, 0)	1	$Z_2 \times ((Z_2^8 : Z_9) : Z_2)$

Tablica 4.8: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 18$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
18	QSRG(18, 5, 0; 4, 3, 2, 1, 0)	2	D_{18}
	QSRG(18, 5, 0; 3, 2, 0)	3	$D_9, D_{18}, \mathbb{Z}_2 \times ((S_3 \times S_3) : \mathbb{Z}_2)$
	QSRG(18, 5, 0; 4, 2, 0)	1	$((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2 : \mathbb{Z}_2$
	QSRG(18, 5, 0; 4, 2, 1, 0)	1	D_9
	QSRG(18, 5, 0; 3, 2, 1, 0)	1	$S_3 \times D_9$
	QSRG(18, 6, 3; 6, 0)	1	3359232
	QSRG(18, 6, 2; 0, 4, 2, 1)	2	D_{18}
	QSRG(18, 6, 2; 3, 2, 1, 0)	1	D_{18}
	QSRG(18, 6, 0; 5, 4, 3, 0)	1	D_{18}
	QSRG(18, 6, 0; 4, 3, 0)	2	$D_9, (\mathbb{Z}_3^2 : \mathbb{Z}_3) : D_4$
	QSRG(18, 6, 0; 4, 2, 1)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^2 : \mathbb{Z}_9) : \mathbb{Z}_2)$
	QSRG(18, 6, 0; 6, 3, 0)	1	559872
	QSRG(18, 7, 0; 6, 5, 0)	2	$D_{18},$ $\mathbb{Z}_2 \times (((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRG(18, 8, 2; 8, 4)	1	$\mathbb{Z}_2 \times (((\mathbb{Z}_2^8 : \mathbb{Z}_3^2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRG(18, 8, 0; 7, 0)	1	725760
	QSRD(18, 9, 6, 4; 7, 4, 3)	1	$\mathbb{Z}_3^2 : \mathbb{Z}_6$
QSRG(18, 9, 4; 6, 4)	1	$(\mathbb{Z}_3^2 : \mathbb{Z}_3) : D_4$	
QSRG(18, 10, 4; 8, 5)	1	$S_6 \times S_3$	
19	QSRD(19, 1, 0, 0; 1, 0)	1	\mathbb{Z}_{19}
	QSRD(19, 2, 0, 0; 2, 1, 0)	7	\mathbb{Z}_{19}
	QSRD(19, 3, 0, 0; 3, 2, 1, 0)	5	\mathbb{Z}_{19}
	QSRD(19, 3, 0, 0; 2, 1, 0)	14	$\mathbb{Z}_{19}, \mathbb{Z}_{19} : \mathbb{Z}_3, 57$
	QSRD(19, 3, 2, 0; 2, 1, 0)	5	\mathbb{Z}_{19}
	QSRD(19, 3, 2, 0; 3, 2, 1, 0)	1	\mathbb{Z}_{19}
	QSRD(19, 4, 0, 0; 4, 3, 2, 1, 0)	3	\mathbb{Z}_{19}
	QSRD(19, 4, 0, 0; 3, 2, 1, 0)	5	\mathbb{Z}_{19}
	QSRD(19, 4, 2, 0; 3, 2, 1, 0)	11	\mathbb{Z}_{19}
	QSRD(19, 4, 2, 0; 4, 2, 1, 0)	3	\mathbb{Z}_{19}
	QSRD(19, 4, 2, 0; 4, 3, 2, 1, 0)	1	\mathbb{Z}_{19}
	QSRD(19, 4, 0, 0; 4, 2, 1, 0)	3	\mathbb{Z}_{19}
	QSRD(19, 4, 2, 0; 2, 1, 0)	1	\mathbb{Z}_{19}
	QSRD(19, 5, 0, 0; 5, 4, 3, 2, 1, 0)	1	\mathbb{Z}_{19}
	QSRD(19, 5, 2, 0; 4, 3, 2, 1, 0)	3	\mathbb{Z}_{19}
	QSRD(19, 5, 2, 0; 5, 4, 3, 2, 1, 0)	1	\mathbb{Z}_{19}
	QSRD(19, 5, 2, 0; 5, 3, 2, 1, 0)	1	\mathbb{Z}_{19}
	QSRD(19, 5, 4, 0; 4, 3, 2, 1, 0)	4	\mathbb{Z}_{19}
	QSRD(19, 5, 4, 0; 5, 4, 3, 2, 1, 0)	1	\mathbb{Z}_{19}
	QSRD(19, 5, 4, 0; 3, 2, 1, 0)	1	\mathbb{Z}_{19}
	QSRD(19, 6, 4, 0; 6, 5, 4, 3, 2, 1, 0)	1	\mathbb{Z}_{19}
	QSRG(19, 2, 0; 1, 0)	1	D_{19}
	QSRG(19, 4, 0; 2, 1, 0)	2	D_{19}
	QSRG(19, 4, 0; 3, 2, 1, 0)	1	D_{19}
	QSRG(19, 6, 2; 3, 2, 1, 0)	1	D_{19}
	QSRG(19, 6, 0; 5, 4, 3, 2, 1, 0)	1	D_{19}
	QSRG(19, 6, 0; 4, 3, 2, 1)	1	D_{19}
	QSRG(19, 6, 2; 2, 1)	1	$\mathbb{Z}_{19} : \mathbb{Z}_6$
DRT(19, 9, 4, 5)	1	$\mathbb{Z}_{19} : \mathbb{Z}_9$	
20	DSRG(20, 4, 0, 1, 1)	1	S_5
	DSRG(20, 7, 3, 2, 4)	2	S_5
	DSRG(20, 8, 2, 4, 4)	5	$\mathbb{Z}_5 : \mathbb{Z}_4$ $(\mathbb{Z}_2 \times ((\mathbb{Z}_2^8 : \mathbb{Z}_5) : \mathbb{Z}_4)) : \mathbb{Z}_2, (2),$ $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^8 : \mathbb{Z}_5)) : \mathbb{Z}_2, (2)$ $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^8 : \mathbb{Z}_5)) : \mathbb{Z}_2,$ $\mathbb{Z}_5 : \mathbb{Z}_4, (2), D_{10},$ $(\mathbb{Z}_2 \times ((\mathbb{Z}_2^8 : \mathbb{Z}_5) : \mathbb{Z}_4)) : \mathbb{Z}_2, (2),$
	DSRG(20, 9, 4, 4, 5)	8	$\mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$ 15000, 122880, \mathbb{Z}_{20}
	QSRD(20, 1, 0, 0; 1, 0)	4	$\mathbb{Z}_5 \times ((\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(20, 2, 1, 0; 2, 1, 0)	4	$\mathbb{Z}_5 \times ((\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2), (2)$ $\mathbb{Z}_{10} \times \mathbb{Z}_2, \mathbb{Z}_{20}$
	QSRD(20, 2, 1, 0; 1, 0)	4	$\mathbb{Z}_5 : \mathbb{Z}_4, (2), D_{10},$ $(\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4$
	QSRD(20, 2, 0, 0; 2, 0)	2	51200, 10240
	QSRD(20, 2, 0, 0; 1, 0)	8	$\mathbb{Z}_5 : \mathbb{Z}_4, (5), \mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4),$ $\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_5)$ $(\mathbb{Z}_5 \times \mathbb{Z}_5) : ((\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_2)$
	QSRD(20, 2, 0, 0; 2, 1, 0)	19	$\mathbb{Z}_5 \times ((\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2), (3),$ $\mathbb{Z}_{20}, (13), \mathbb{Z}_{10} \times \mathbb{Z}_2,$ $\mathbb{Z}_4 \times D_5, (\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(20, 3, 2, 1; 1, 0)	2	$D_{10}, (\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4$
	QSRD(20, 3, 1, 0; 3, 2, 1, 0)	4	$\mathbb{Z}_5 \times ((\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2), (2),$ $\mathbb{Z}_{20}, \mathbb{Z}_{10} \times \mathbb{Z}_2$

Tablica 4.9: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n \in \{18, 19, 20\}$

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
20	QSRD(20,3,2,0;2,1,0)	30	$\mathbb{Z}_5 : \mathbb{Z}_4, (5), \mathbb{Z}_{10} \times \mathbb{Z}_2, (3),$ $\mathbb{Z}_5 \times D_4, (2), (5), D_{10}, (3),$ $(\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2),$ $(\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4,$ $\mathbb{Z}_5 \times ((\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2), \mathbb{Z}_{20}, (10),$ $\mathbb{Z}_4 \times D_5, (2)$
	QSRD(20,3,2,0;1,0)	6	$D_{10}, (4), \mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(20,3,1,0;1,0)	6	$\mathbb{Z}_5 : \mathbb{Z}_4, (5), \mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(20,3,1,0;2,1,0)	25	$\mathbb{Z}_{10} \times \mathbb{Z}_2, (6), \mathbb{Z}_{20}, (8),$ $\mathbb{Z}_5 : \mathbb{Z}_4, (4), \mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2),$ $D_{10}, (3), \mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)$ $\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_5)$
	QSRD(20,3,1,0;2,0)	3	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_5), (2),$ $(\mathbb{Z}_5 \times \mathbb{Z}_5) : ((\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_2)$
	QSRD(20,3,0,0;2,1,0)	53	$\mathbb{Z}_5 : \mathbb{Z}_4, (9), \mathbb{Z}_{20}, (30),$ $\mathbb{Z}_{10} \times \mathbb{Z}_2, (6), \mathbb{Z}_5 \times D_4, (4),$ $\mathbb{Z}_4 \times (\mathbb{Z}_2^4 : \mathbb{Z}_5), (2), (\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4$ $\mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(20,3,2,0;3,1,0)	1	$(\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4$
	QSRD(20,3,0,0;1,0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4), S_5$
	QSRD(20,3,0,0;3,2,0)	3	$\mathbb{Z}_5 \times S_4, \mathbb{Z}_5 \times D_4, \mathbb{Z}_{20}$
	QSRD(20,3,0,0;3,2,1,0)	11	$\mathbb{Z}_{20}, (8), \mathbb{Z}_{10} \times \mathbb{Z}_2$ $\mathbb{Z}_4 \times D_5, (2)$
	QSRD(20,3,2,0;3,2,1,0)	2	$\mathbb{Z}_5 \times ((\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2), \mathbb{Z}_{20}$
	QSRD(20,3,0,0;3,1,0)	2	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,4,2,1;2,1,0)	1	D_{10}
	QSRD(20,4,1,0;4,3,2,1,0)	2	$\mathbb{Z}_{20}, \mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20,4,3,0;4,3,0)	1	$\mathbb{Z}_5 \times ((\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(20,4,3,0;2,1,0)	33	$D_{10}, (15), \mathbb{Z}_5 : \mathbb{Z}_4, (8)$ $\mathbb{Z}_{10} \times \mathbb{Z}_2, (5), \mathbb{Z}_{20}, (5)$
	QSRD(20,4,1,0;3,2,1,0)	10	$\mathbb{Z}_{20}, (7), \mathbb{Z}_{10} \times \mathbb{Z}_2, (3)$
	QSRD(20,4,2,0;2,1,0)	30	$\mathbb{Z}_5 : \mathbb{Z}_4, (6), D_{10}, (5), \mathbb{Z}_{10} \times \mathbb{Z}_2, (2),$ $\mathbb{Z}_5 \times D_4, (\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2,$ $\mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4), \mathbb{Z}_{20}, (14)$
	QSRD(20,4,3,0;3,2,1,0)	10	$\mathbb{Z}_{20}, (2), \mathbb{Z}_{10} \times \mathbb{Z}_2, (2),$ $\mathbb{Z}_5 : \mathbb{Z}_4, D_{10}, (2)$
	QSRD(20,4,3,0;4,3,2,1,0)	2	$\mathbb{Z}_{20}, (2), \mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20,4,2,0;3,2,1,0)	56	$\mathbb{Z}_{10} \times \mathbb{Z}_2, (9), D_{10}, (5),$ $\mathbb{Z}_5 : \mathbb{Z}_4, (12), \mathbb{Z}_{20}, (28), \mathbb{Z}_5 \times D_4, (2)$
	QSRD(20,4,1,0;4,2,1,0)	10	$\mathbb{Z}_{10} \times \mathbb{Z}_2, (6), \mathbb{Z}_{20}, (4)$
	QSRD(20,4,1,0;3,2,0)	4	$\mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20,4,2,0;4,2,1,0)	17	$\mathbb{Z}_5 \times D_4,$ $(\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2), \mathbb{Z}_5 : \mathbb{Z}_4, (2),$ $\mathbb{Z}_4 \times D_5, (3), \mathbb{Z}_{10} \times \mathbb{Z}_2, (2), \mathbb{Z}_{20}, (7)$
	QSRD(20,4,3,0;3,1,0)	2	D_{10}
	QSRD(20,4,2,0;4,2,0)	2	10240
	QSRD(20,4,1,0;2,1,0)	1	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,4,1,0;1)	1	S_5
	QSRD(20,4,2,0;2,0)	5	10240, $\mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4),$ $\mathbb{Z}_{10} \times \mathbb{Z}_2, (\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2)$
	QSRD(20,4,2,1;2,0)	3	$(\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4,$ $(\mathbb{Z}_5 \times \mathbb{Z}_5) : ((\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_2), (2)$
	QSRD(20,4,0,0;4,2,0)	3	10240, (3), (3), (3)
	QSRD(20,4,0,0;3,2,1,0)	25	$\mathbb{Z}_{20}, (15), \mathbb{Z}_5 \times D_4, (2),$ $\mathbb{Z}_{10} \times \mathbb{Z}_2, \mathbb{Z}_5 : \mathbb{Z}_4, (5),$ $\mathbb{Z}_5 \times S_4, (2)$
	QSRD(20,4,0,0;4,2,1,0)	14	$\mathbb{Z}_5 \times D_4, (2), \mathbb{Z}_{20}, (8)$ $\mathbb{Z}_5 : \mathbb{Z}_4, (2),$ $(\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4, \mathbb{Z}_{20} : \mathbb{Z}_4$
	QSRD(20,4,0,0;2,0)	1	20480
	QSRD(20,4,0,0;4,0)	1	39813120
	QSRD(20,4,0,0;4,3,2,1,0)	5	$\mathbb{Z}_{20}, (4), (\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(20,4,2,0;4,3,2,1,0)	1	\mathbb{Z}_{20}
	QSRD(20,4,0,0;4,3,0)	2	$\mathbb{Z}_4 \times S_5, \mathbb{Z}_{20}$
	QSRD(20,5,3,2;4,2,0)	2	10240
	QSRD(20,5,3,2;2,0)	1	10240
	QSRD(20,5,3,2;2,1,0)	1	D_{10}
	QSRD(20,5,1,1;2,1)	8	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,5,2,1;2,1,0)	1	D_{10}
	QSRD(20,5,1,1;3,2,1,0)	4	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,5,2,1;2,1)	2	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,5,1,0;5,4,3,2,1,0)	2	$\mathbb{Z}_{20}, \mathbb{Z}_{10} \times \mathbb{Z}_2$

Tablica 4.10: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 20$

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
20	QSRD(20,5,4,0;3,2,1,0)	21	$\mathbb{Z}_5 : \mathbb{Z}_4, (4), D_{10}, (10)$ $\mathbb{Z}_4 \times \mathbb{S}_5, \mathbb{Z}_{10} \times \mathbb{Z}_2,$ $\mathbb{Z}_5 \times D_4,$ $(\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2,$ $\mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4), \mathbb{Z}_{20}, (2)$
	QSRD(20,5,3,0;4,3,2,1,0)	16	$\mathbb{Z}_{20}, (7), D_{10}, (5)$ $\mathbb{Z}_{10} \times \mathbb{Z}_2, (4)$
	QSRD(20,5,3,0;5,4,3,2,1,0)	2	$\mathbb{Z}_{20}, \mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20,5,3,0;2,1,0)	1	D_{10}
	QSRD(20,5,4,0;4,3,2,1,0)	28	$D_{10}, (7), \mathbb{Z}_5 : \mathbb{Z}_4, (4),$ $(\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2, (4),$ $\mathbb{Z}_{10} \times \mathbb{Z}_2, (3), \mathbb{Z}_{20}, (10)$ $\mathbb{Z}_{10} \times \mathbb{Z}_2, (3), \mathbb{Z}_{20}, (7),$ $\mathbb{Z}_5 \times D_4, (2)$
	QSRD(20,5,2,0;4,3,2,0)	12	$\mathbb{Z}_{10} \times \mathbb{Z}_2$ $\mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(20,5,1,0;4,3,2,0)	3	$\mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20,5,3,0;4,3,2,0)	6	$\mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20,5,2,0;4,3,2,1,0)	27	$\mathbb{Z}_{10} \times \mathbb{Z}_2, (3),$ $\mathbb{Z}_5 : \mathbb{Z}_4, (8), \mathbb{Z}_{20}, (16)$
	QSRD(20,5,3,0;5,3,2,0)	1	$\mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20,5,2,0;4,2,1,0)	9	$\mathbb{Z}_{10} \times \mathbb{Z}_2, (3), \mathbb{Z}_{20}, (4),$ $\mathbb{Z}_5 \times \mathbb{S}_4, \mathbb{Z}_5 \times D_4$
	QSRD(20,5,2,0;5,4,2,0)	6	$\mathbb{Z}_{10} \times \mathbb{Z}_2, (2),$ $\mathbb{Z}_5 \times D_4, (2), \mathbb{Z}_{20}, (2)$
	QSRD(20,5,3,0;3,2,1,0)	3	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2), (2), D_{10}$
	QSRD(20,5,1,0;4,2,0)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_5)$
	QSRD(20,5,3,0;4,2,1,0)	3	$\mathbb{Z}_{10} \times \mathbb{Z}_2, (2), \mathbb{Z}_{20}$
	QSRD(20,5,3,0;3,2,0)	6	$\mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4) (4), D_{10} (2)$
	QSRD(20,5,4,0;4,2,1,0)	7	$\mathbb{Z}_5 : \mathbb{Z}_4, \mathbb{Z}_5 \times D_4, (2),$ $\mathbb{Z}_{10} \times \mathbb{Z}_2, (2), \mathbb{Z}_{20}, (2)$
	QSRD(20,5,1,0;4,3,2,1,0)	1	\mathbb{Z}_{20}
	QSRD(20,5,4,0;4,3,2,0)	8	$\mathbb{Z}_{10} \times \mathbb{Z}_2, (3)$ $\mathbb{Z}_{20}, (3), \mathbb{Z}_5 \times D_4, (2)$
	QSRD(20,5,4,0;5,2,1,0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4)$
	QSRD(20,5,3,2;4,1,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_5)$
	QSRD(20,5,3,2;4,2,1,0)	2	\mathbb{Z}_{20}
	QSRD(20,5,1,0;3,0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4)$
	QSRD(20,5,3,2;3,0)	3	$(\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4,$ $(\mathbb{Z}_5 \times \mathbb{Z}_5) : ((\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_2) (2)$
	QSRD(20,5,2,2;5,4,2,0)	2	$\mathbb{Z}_5 \times ((\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(20,5,2,0;3,2,1,0)	2	$(\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4$
	QSRD(20,5,2,0;5,3,2,1,0)	5	$\mathbb{Z}_5 : \mathbb{Z}_4, (4), \mathbb{Z}_{20}$
	QSRD(20,5,4,0;5,3,1,0)	1	$(\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4$
	QSRD(20,5,0,0;4,2,1,0)	2	$\mathbb{Z}_4 \times (\mathbb{Z}_2^4 : \mathbb{Z}_5)$
	QSRD(20,5,2,0;3,2,0)	4	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,5,4,0;5,2,0)	2	$\mathbb{Z}_4 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)$
	QSRD(20,5,0,0;4,3,2,0)	2	\mathbb{Z}_{20}
	QSRD(20,5,2,0;5,3,2,0)	3	$\mathbb{Z}_5 : \mathbb{Z}_4, (2), \mathbb{Z}_{20}$
	QSRD(20,5,2,0;5,2,1,0)	2	$\mathbb{Z}_5 \times D_4, \mathbb{Z}_{20}$
	QSRD(20,5,0,0;3,1,0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4)$
	QSRD(20,5,0,0;5,3,2,0)	1	$\mathbb{Z}_4 \times \mathbb{S}_5$
	QSRD(20,5,0,0;5,4,3,2,1,0)	2	$\mathbb{Z}_{20}, \mathbb{Z}_4 \times D_5$
	QSRD(20,5,0,1;4,3,2,1,0)	2	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,5,0,1;4,2,1,0)	1	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,5,0,0;5,0)	1	829440000
	QSRD(20,5,2,0;5,4,3,2,1,0)	1	\mathbb{Z}_{20}
	QSRD(20,5,4,0;5,4,3,2,1,0)	1	\mathbb{Z}_{20}
	QSRD(20,6,3,2;3,2,1,0)	1	D_{10}
	QSRD(20,6,3,2;4,2,1,0)	8	$(\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2), \mathbb{Z}_5 \times D_4, (6)$
	QSRD(20,6,4,2;4,2,1,0)	1	D_{10}
	QSRD(20,6,4,2;3,2,1,0)	3	D_{10}
	QSRD(20,6,2,1;3,2,1)	6	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,6,4,2;4,2,1)	1	D_{10}
	QSRD(20,6,4,2;4,2,0)	4	$\mathbb{Z}_{10} \times \mathbb{Z}_2,$ $(\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2), 10240$
	QSRD(20,6,4,1;3,2,1)	2	D_{10}
QSRD(20,6,4,2;6,2,1,0)	2	$(\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2,$ $\mathbb{Z}_5 \times D_4$	

Tablica 4.11: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 20$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
20	QSRD(20,6,3,2;3,2,1)	2	S_5
	QSRD(20,6,3,1;3,2,1)	2	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,6,2,1;4,3,2,1)	2	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,6,3,2;5,4,2,1,0)	2	$\mathbb{Z}_{10} \times \mathbb{Z}_2, \mathbb{Z}_{20}$
	QSRD(20,6,5,0;5,4,3,2,1,0)	6	$D_{10}, (5), \mathbb{Z}_{20}$
	QSRD(20,6,3,0;6,5,4,3,2,1,0)	1	\mathbb{Z}_{20}
	QSRD(20,6,5,0;4,3,2,1,0)	1	\mathbb{Z}_{20}
	QSRD(20,6,5,0;6,5,4,3,2,1,0)	1	\mathbb{Z}_{20}
	QSRD(20,6,4,0;4,2,1)	1	D_{10}
	QSRD(20,6,2,0;6,5,4,3,2,0)	2	$(\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_{20}$
	QSRD(20,6,3,0;5,4,3,2,0)	2	$\mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20,6,3,0;6,4,3,2,0)	3	$\mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20,6,3,0;6,5,4,3,2,0)	1	$\mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20,6,2,0;5,4,3,2,0)	6	$\mathbb{Z}_{10} \times \mathbb{Z}_2, \mathbb{Z}_{20}$
	QSRD(20,6,4,0;6,4,3,2,0)	13	$(\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2, (3),$ $\mathbb{Z}_{10} \times \mathbb{Z}_2, (2), \mathbb{Z}_4 \times D_5, (2),$ $\mathbb{Z}_{20}, (5), \mathbb{Z}_5 \times D_4, (5)$
	QSRD(20,6,4,0;5,4,3,2,0)	20	$\mathbb{Z}_{10} \times \mathbb{Z}_2, (6), D_{10},$ $\mathbb{Z}_5 : \mathbb{Z}_4, (3), \mathbb{Z}_{20}, (10)$
	QSRD(20,6,3,0;5,4,2,0)	2	$\mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20,6,5,0;4,3,2,0)	3	$\mathbb{Z}_{10} \times \mathbb{Z}_2, (2), D_{10}$
	QSRD(20,6,5,0;5,4,3,2,0)	4	$\mathbb{Z}_{10} \times \mathbb{Z}_2, (2), D_{10}, (2)$
	QSRD(20,6,5,0;6,5,4,3,2,0)	1	$\mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20,6,5,0;6,5,2,0)	1	$\mathbb{Z}_{10} \times D_5$
	QSRD(20,6,2,0;6,4,2,0)	2	10240
	QSRD(20,6,4,0;4,2,0)	4	10240, (3), $\mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(20,6,4,0;6,4,2,1,0)	2	$\mathbb{Z}_{10} \times \mathbb{Z}_2, \mathbb{Z}_{20}$
	QSRD(20,6,4,0;4,3,0)	7	$\mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (4),$ $D_{10}, \mathbb{Z}_5 : \mathbb{Z}_4, (2)$
	QSRD(20,6,3,2;4,3,2,1,0)	2	\mathbb{Z}_{20}
	QSRD(20,6,2,2;6,2,1)	1	$(\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4$
	QSRD(20,6,4,0;5,4,3,0)	1	D_{10}
	QSRD(20,6,5,0;5,3,2,0)	1	D_{10}
	QSRD(20,6,5,0;4,3,0)	1	D_{10}
	QSRD(20,6,2,0;6,4,3,0)	2	$\mathbb{Z}_{20} : \mathbb{Z}_4, \mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,6,2,0;4,2,0)	1	20480
	QSRD(20,6,2,2;4,3,2,1,0)	2	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,6,4,0;5,4,3,2,1,0)	4	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,6,2,2;6,2,1,0)	2	$\mathbb{Z}_5 : \mathbb{Z}_4, \mathbb{Z}_{20}$
	QSRD(20,6,4,0;6,4,3,0)	2	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,6,2,0;5,4,3,0)	3	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,6,2,0;6,4,3,2,0)	2	\mathbb{Z}_{20}
	QSRD(20,6,4,0;6,4,2,0)	1	10240
	QSRD(20,6,2,0;6,5,2,0)	2	$\mathbb{Z}_4 \times S_5, \mathbb{Z}_{20}$
	QSRD(20,6,4,0;6,5,4,3,2,0)	1	\mathbb{Z}_{20}
	QSRD(20,6,4,0;4,1,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_5)$
	QSRD(20,6,4,0;4,2,1,0)	2	\mathbb{Z}_{20}
	QSRD(20,7,5,4;2,0)	1	10240
	QSRD(20,7,4,3;3,2,1)	1	D_{10}
	QSRD(20,7,2,2;4,3,2)	6	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,7,4,2;3,2)	3	D_{10}
	QSRD(20,7,3,2;6,4,2,0)	2	10240
	QSRD(20,7,3,2;4,2)	1	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,7,3,2;4,0)	1	20480
	QSRD(20,7,3,2;5,4,2,1,0)	6	$\mathbb{Z}_{20}, (3), \mathbb{Z}_{10} \times \mathbb{Z}_2, (3)$
	QSRD(20,7,4,2;4,3,2)	3	$D_{10}, (\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2)$
	QSRD(20,7,1,2;5,4,3,2,1,0)	1	\mathbb{Z}_{20}
	QSRD(20,7,2,2;5,3,2,1)	2	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,7,3,2;4,3,2)	1	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,7,2,2;3,2)	2	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20,7,4,3;(2))	2	$S_5,$
	QSRD(20,7,4,2;5,4,3,2,0)	1	$\mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20,7,6,0;7,6,5,4,0)	2	$\mathbb{Z}_{10} \times D_5, \mathbb{Z}_{20}$
	QSRD(20,7,5,0;6,4,0)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_5),$ $(\mathbb{Z}_5 \times \mathbb{Z}_5) : ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(20,7,4,0;7,6,5,4,0)	6	$\mathbb{Z}_{10} \times \mathbb{Z}_2, \mathbb{Z}_{20}, (3),$ $\mathbb{Z}_4 \times D_5, (2)$
	QSRD(20,7,4,0;6,5,4,0)	12	$\mathbb{Z}_{10} \times \mathbb{Z}_2, (3),$ $\mathbb{Z}_{20}, (5), \mathbb{Z}_5 : \mathbb{Z}_4, (2),$ $\mathbb{Z}_4 \times (\mathbb{Z}_2^4 : \mathbb{Z}_5), \mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$

Tablica 4.12: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 20$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
20	QSRD(20, 7, 5, 0; 6, 5, 4, 0)	5	$\mathbb{Z}_{10} \times \mathbb{Z}_2, (3),$ $\mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4), D_{10}$
	QSRD(20, 7, 5, 0; 7, 6, 5, 4, 0)	2	$\mathbb{Z}_{10} \times D_5, \mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20, 7, 6, 0; 6, 4, 3, 2, 0)	5	$(\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2), \mathbb{Z}_5 \times D_4,$ $\mathbb{Z}_{20}, \mathbb{Z}_5 \times S_4$
	QSRD(20, 7, 6, 0; 6, 5, 4, 0)	11	$\mathbb{Z}_{10} \times \mathbb{Z}_2, (3), D_{10}, (2),$ $\mathbb{Z}_5 : \mathbb{Z}_4, (2), \mathbb{Z}_{20}, (4)$
	QSRD(20, 7, 6, 0; 5, 4, 0)	1	D_{10}
	QSRD(20, 7, 5, 0; 5, 4, 0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(20, 7, 2, 2; 6, 4, 3, 2, 1, 0)	3	\mathbb{Z}_{20}
	QSRD(20, 7, 6, 0; 7, 6, 4, 3, 2, 0)	1	$(\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4$
	QSRD(20, 7, 2, 2; 6, 4, 3, 2, 0)	1	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20, 7, 2, 2; 4, 3, 2, 0)	2	$\mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20, 7, 0, 2; 6, 5, 4, 3, 2, 0)	2	$\mathbb{Z}_5 \times D_4, \mathbb{Z}_{20}$
	QSRD(20, 7, 2, 2; 6, 5, 4, 3, 2, 1, 0)	1	\mathbb{Z}_{20}
	QSRD(20, 7, 6, 0; 7, 5, 4, 0)	1	$(\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4$
	QSRD(20, 7, 4, 0; 5, 0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(20, 7, 4, 0; 7, 5, 4, 0)	1	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20, 7, 0, 2; 6, 4, 3, 2, 1, 0)	1	\mathbb{Z}_{20}
	QSRD(20, 7, 2, 2; 5, 4, 3, 2, 0)	2	\mathbb{Z}_{20}
	QSRD(20, 8, 4, 3; 4, 3)	4	$D_{10}, \mathbb{Z}_5 : \mathbb{Z}_4, (2), \mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(20, 8, 5, 3; 5, 4, 3, 2)	2	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20, 8, 5, 2; 5, 4, 2)	1	D_{10}
	QSRD(20, 8, 4, 2; (4))	5	$\mathbb{Z}_5 : \mathbb{Z}_4, (2), 20480, (2), 10240$
	QSRD(20, 8, 4, 2; 5, 4, 0)	1	$(\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_4$
	QSRD(20, 8, 6, 0; 8, 7, 6, 0)	8	$\mathbb{Z}_{10} \times D_5, \mathbb{Z}_{10} \times \mathbb{Z}_2,$ $(\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2,$ $\mathbb{Z}_4 \times D_5, \mathbb{Z}_{20}, (4)$
	QSRD(20, 8, 6, 0; 8, 6, 0)	1	10240
	QSRD(20, 8, 6, 0; 7, 6, 0)	3	$(\mathbb{Z}_5 \times \mathbb{Z}_5) : ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2),$ $\mathbb{Z}_5 : \mathbb{Z}_4,$ $\mathbb{Z}_2 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(20, 8, 7, 0; 8, 7, 6, 0)	2	$\mathbb{Z}_{10} \times D_5, \mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20, 8, 7, 0; 7, 6, 0)	1	D_{10}
	QSRD(20, 9, 5, 4; (4))	6	$\mathbb{Z}_5 : \mathbb{Z}_4, (2), D_{10},$ 20480, (2), 10240, (2)
	QSRD(20, 9, 6, 4; 6, 4, 3, 2)	2	D_{10}
	QSRD(20, 9, 8, 0; 9, 8, 0)	3	$\mathbb{Z}_{10} \times D_5, \mathbb{Z}_4 \times (\mathbb{Z}_2^4 : S_5), \mathbb{Z}_{20}$
	QSRD(20, 10, 6, 4; 6, 5)	6	$D_{10}, 10240,$ $\mathbb{Z}_5 : \mathbb{Z}_4, (2), 20480, (2)$
	QSRD(20, 10, 7, 4; 7, 6, 4)	2	D_{10}
	QSRD(20, 10, 6, 4; 7, 6, 2)	1	$(\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_4$
	QSRD(20, 10, 7, 4; 10, 8, 7, 6, 4)	2	$\mathbb{Z}_{10} \times \mathbb{Z}_2$
	QSRD(20, 10, 6, 4; 7, 6, 4)	2	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20, 10, 4, 4; 10, 8, 4)	2	10240
	QSRD(20, 10, 6, 4; 10, 8, 7, 6, 4)	2	\mathbb{Z}_{20}
	QSRD(20, 10, 4, 4; 9, 4)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_5)$
	QSRD(20, 10, 4, 4; 10, 9, 8, 4)	2	\mathbb{Z}_{20}
	QSRD(20, 11, 7, 6; 6, 2)	5	$\mathbb{Z}_5 : \mathbb{Z}_4, (2),$ 20480, (2), 10240
	QSRD(20, 12, 9, 6; 9, 6)	2	S_5
	QSRD(20, 13, 9, 8; 10, 8)	1	$\mathbb{Z}_5 : \mathbb{Z}_4$
	QSRD(20, 15, 12, 11; (12))	1	S_5
	QSRG(20, 1, 1, 0; 0)	1	3715891200
	QSRG(20, 2, 0; 2, 0)	1	3932160
	QSRG(20, 2, 0; 1, 0)	3	$D_{20}, 240000,$ $(\mathbb{Z}_5 \times \mathbb{Z}_5) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$
	QSRG(20, 3, 0; 2, 1, 0)	6	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_5, \mathbb{Z}_5 : \mathbb{Z}_4,$ $(\mathbb{Z}_5 \times \mathbb{Z}_5) : (\mathbb{Z}_2^4 : \mathbb{Z}_2), (2),$ $\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2), D_{20}$
	QSRG(20, 3, 0; 1, 0)	4	$D_{10}, \mathbb{Z}_2 \times S_5, 28800, \mathbb{Z}_2 \times A_5$
	QSRG(20, 3, 2; 0)	1	955514880
	QSRG(20, 4, 0; 2, 1, 0)	19	$\mathbb{Z}_5 : \mathbb{Z}_4, D_{10}, (4), D_4 \times D_5, (2),$ $\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_5, D_{20}, (4),$ $(\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_4, (3), \mathbb{Z}_2 \times S_5, (2),$ $\mathbb{Z}_2 \times A_5,$ $\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)$
QSRG(20, 4, 0; 3, 2, 1, 0)	1	D_{20}	
QSRG(20, 4, 0; 4, 2, 0)	2	20480, 204800	
QSRG(20, 4, 0; 3, 0)	1	115200	
QSRG(20, 4, 3; 0)	1	4976640000	
QSRG(20, 5, 0; 4, 3, 2, 1, 0)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_5, D_{20}$	
QSRG(20, 5, 0; 5, 0)	1	1658880000	
QSRG(20, 5, 0; 3, 2, 1, 0)	3	$D_{10}, (2), D_{20}$	
QSRG(20, 5, 0; 2, 1, 0)	6	$\mathbb{Z}_5 : \mathbb{Z}_4, (2), (\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_4,$ $D_{10}, (2), D_{20}$	

Tablica 4.13: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 20$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)	
20	QSRG(20, 5, 0; 3, 2, 0)	3	$D_{10}, (2), \mathbb{Z}_2 \times \mathbb{Z}_2 \times S_5$	
	QSRG(20, 5, 0; 4, 2, 0)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)$	
	QSRG(20, 5, 0; 4, 3, 1, 0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)$	
	QSRG(20, 5, 0; 4, 2, 1, 0)	5	$D_{10}, (3), \mathbb{Z}_5 : \mathbb{Z}_4,$ $\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4)$ $\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)$	
	QSRG(20, 5, 0; 2, 1)	1	$\mathbb{Z}_2 \times S_5, D_{20}, (2)$	
	QSRG(20, 6, 2; 2, 1, 0)	3	$D_4 \times D_5$	
	QSRG(20, 6, 2; 4, 2, 1, 0)	2	D_{20}	
	QSRG(20, 6, 2; 3, 2, 1, 0)	1	D_{20}	
	QSRG(20, 6, 0; 5, 4, 3, 2, 0)	1	D_{20}	
	QSRG(20, 6, 0; 4, 3, 2, 1)	3	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_5, \mathbb{Z}_5 : \mathbb{Z}_4, D_{20}$	
	QSRG(20, 6, 0; 4, 3, 2, 0)	7	$D_{10}, (\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_4,$ $D_{20}, (2), \mathbb{Z}_2 \times \mathbb{Z}_2 \times D_5,$ $D_4 \times D_5, S_4 \times D_5$	
	QSRG(20, 6, 0; 4, 3, 2, 1, 0)	2	D_{20}, D_{10}	
	QSRG(20, 6, 0; 4, 3, 0)	3	$D_{10}, (2), \mathbb{Z}_2 \times S_5$	
	QSRG(20, 6, 0; 3, 2)	1	$S_5 \times D_4$	
	QSRG(20, 6, 0; 5, 2, 0)	1	57600	
	QSRG(20, 6, 0; 6, 4, 2, 0)	2	20480	
	QSRG(20, 6, 0; 6, 2)	1	122880	
	QSRG(20, 6, 2; 2, 1)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)$	
	QSRG(20, 6, 3; 4, 0)	1	28800	
	QSRG(20, 6, 1; 2, 0)	1	$\mathbb{Z}_2 \times S_5$	
	QSRG(20, 7, 0; 6, 5, 4, 0)	3	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_5,$ $\mathbb{Z}_2 \times ((\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4),$ $\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)$	
	QSRG(20, 7, 0; 5, 4, 0)	2	$D_{10}, \mathbb{Z}_2 \times S_5$	
	QSRG(20, 7, 0; 6, 5, 4, 3, 2, 1)	1	D_{20}	
	QSRG(20, 7, 0; 6, 4, 3, 2, 0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)$	
	QSRG(20, 8, 0; 7, 6, 0)	2	$D_{20}, \mathbb{Z}_2 \times ((\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4)$	
	QSRG(20, 8, 0; 8, 6, 0)	1	245760	
	QSRG(20, 8, 0; 8, 4)	1	79626240	
	QSRG(20, 8, 6; 8, 0)	1	29491200	
	QSRG(20, 9, 4; 4, 0)	1	$\mathbb{Z}_2 \times S_6$	
	QSRG(20, 9, 0; 8, 0)	1	7257600	
	QSRG(20, 9, 8; 0)	1	26336378880000	
	QSRG(20, 10, 0; (10))	1	26336378880000	
	QSRG(20, 12, 6; 9, 8)	1	$S_5 \times S_4$	
	QSRG(20, 12, 6; 12, 8)	1	122880	
	QSRG(20, 15, 10; (15))	1	4976640000	
	QSRG(20, 16, 12; (16))	1	955514880	
	QSRG(20, 16, 16; 18)	1	3715891200	
	21	DSRG(21, 6, 1, 2, 2)	4	$PSL(3, 2), (2), \mathbb{Z}_7 : \mathbb{Z}_6, (2)$
		DSRG(21, 8, 3, 3, 4)	3	$PSL(3, 2), \mathbb{Z}_7 : \mathbb{Z}_6, (2)$
		QSRD(21, 1, 0, 0; 1, 0)	1	$\mathbb{Z}_7 \times ((\mathbb{Z}_7 \times \mathbb{Z}_7) : S_3)$
		QSRD(21, 2, 0, 0; 2, 1, 0)	3	$\mathbb{Z}_7 \times ((\mathbb{Z}_7 \times \mathbb{Z}_7) : S_3), \mathbb{Z}_7 \times S_3, \mathbb{Z}_3 \times D_7$
		QSRD(21, 2, 0, 0; 1, 0)	2	$\mathbb{Z}_7 : \mathbb{Z}_6$
		QSRD(21, 3, 2, 0; 1, 0)	2	$\mathbb{Z}_7 : \mathbb{Z}_6$
		QSRD(21, 3, 2, 0; 2, 1, 0)	1	$\mathbb{Z}_3 \times D_7$
		QSRD(21, 3, 0, 0; 3, 2, 1, 0)	1	$\mathbb{Z}_3 \times D_7$
		QSRD(21, 3, 0, 0; 2, 1, 0)	7	$\mathbb{Z}_7 : \mathbb{Z}_6, (2), \mathbb{Z}_7 \times S_3, (4), \mathbb{Z}_3 \times (\mathbb{Z}_7 : \mathbb{Z}_3)$
		QSRD(21, 3, 0, 0; 1, 0)	2	$\mathbb{Z}_7 : \mathbb{Z}_6$
QSRD(21, 4, 0, 0; 3, 2, 1, 0)		3	$\mathbb{Z}_3 \times (\mathbb{Z}_7 : \mathbb{Z}_3), \mathbb{Z}_7 \times S_3, (2)$	
QSRD(21, 4, 0, 0; 2, 1, 0)		3	$\mathbb{Z}_3 \times (\mathbb{Z}_7 : \mathbb{Z}_3), \mathbb{Z}_7 \times S_3, PSL(3, 2)$	
QSRD(21, 4, 2, 0; 3, 2, 1, 0)		1	$\mathbb{Z}_7 \times S_3$	
QSRD(21, 4, 2, 0; 4, 2, 1, 0)		1	$\mathbb{Z}_3 \times D_7$	
QSRD(21, 4, 2, 0; 2, 1, 0)		4	$\mathbb{Z}_7 : \mathbb{Z}_6, (2), \mathbb{Z}_3 \times D_7, \mathbb{Z}_7 \times S_3$	
QSRD(21, 4, 0, 0; 4, 2, 1, 0)		2	$\mathbb{Z}_7 \times S_3$	
QSRD(21, 4, 0, 0; 3, 2, 0)		2	$\mathbb{Z}_7 : \mathbb{Z}_6$	
QSRD(21, 4, 0, 0; 4, 3, 2, 1, 0)		1	$\mathbb{Z}_3 \times D_7$	
QSRD(21, 5, 2, 0; 4, 3, 2, 1, 0)		1	$\mathbb{Z}_3 \times D_7$	
QSRD(21, 5, 0, 0; 4, 3, 0)		2	$\mathbb{Z}_7 : \mathbb{Z}_6$	
QSRD(21, 5, 0, 0; 5, 4, 3, 0)		1	$\mathbb{Z}_3 \times D_7$	
QSRD(21, 5, 0, 0; 4, 3, 2, 1, 0)		2	$\mathbb{Z}_7 \times S_3$	
QSRD(21, 5, 4, 0; 4, 3, 2, 1, 0)		1	$\mathbb{Z}_7 \times S_3$	
QSRD(21, 5, 4, 0; 3, 2, 1, 0)		1	$\mathbb{Z}_7 \times S_3$	
QSRD(21, 6, 4, 0; 5, 4, 3, 2, 1, 0)		1	$\mathbb{Z}_7 \times S_3$	
QSRD(21, 6, 0, 0; 6, 5, 0)		1	$\mathbb{Z}_3 \times S_7$	
QSRD(21, 7, 2, 2; 3, 2)		4	$\mathbb{Z}_7 : \mathbb{Z}_6$	
QSRD(21, 7, 0, 0; 7, 0)		1	384072192000	
SRG(21, 10, 3, 6)		1	S_7	
SRG(21, 10, 5, 4)		1	S_7	

Tablica 4.14: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n \in \{20, 21\}$

Stupanj	Parametri	# neizom.	Aut(S) ili Aut(S)
21	QSRG(21,2,0;1,0)	1	D_{21}
	QSRG(21,4,0;2,1,0)	3	D_{21}
	QSRG(21,4,0;3,2,1,0)	1	D_{21}
	QSRG(21,4,1;1,0)	1	$PSL(3,2) : \mathbb{Z}_2$
	QSRG(21,6,1;3,2,1)	1	$\mathbb{Z}_7 : \mathbb{Z}_6$
	QSRG(21,6,2;3,2,1,0)	1	D_{21}
	QSRG(21,6,0;4,3,2,1)	1	D_{21}
	QSRG(21,6,0;5,4,3,2,1,0)	1	D_{21}
	QSRG(21,6,2;2,1,0)	1	$\mathbb{Z}_7 : (\mathbb{Z}_3 \times S_3)$
	QSRG(21,8,3;4,2)	1	$PSL(3,2) : \mathbb{Z}_2$
QSRG(21,8,2;4,2)	1	$PSL(3,2) : \mathbb{Z}_2$	
22	DSRG(22,10,4,5,5)	1	$\mathbb{Z}_{11} : \mathbb{Z}_{10}$
	QSRD(22,1,0,0;1,0)	1	$\mathbb{Z}_{11} \times D_{11}$
	QSRD(22,2,0,0;2,1,0)	3	$\mathbb{Z}_{11} \times D_{11}$
	QSRD(22,2,0,0;2,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^{10} : \mathbb{Z}_{11})$
	QSRD(22,3,0,0;3,2,1,0)	1	$\mathbb{Z}_{11} \times D_{11}$
	QSRD(22,3,2,0;2,1,0)	1	$\mathbb{Z}_{11} \times D_{11}$
	QSRD(22,3,2,0;3,2,1,0)	1	$\mathbb{Z}_{11} \times D_{11}$
	QSRD(22,4,0,0;4,2,0)	3	$\mathbb{Z}_2 \times (\mathbb{Z}_2^{10}) : \mathbb{Z}_{11}$
	QSRD(22,5,0,2;3,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : (\mathbb{Z}_5 \times D_5)$
	QSRD(22,5,0,0;3,2,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_{11} : \mathbb{Z}_5)$
	QSRD(22,6,1,0;4,3,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_{11} : \mathbb{Z}_5)$
	QSRD(22,6,0,0;6,4,2,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^{10}) : \mathbb{Z}_{11}$
	QSRD(22,6,4,0;4,2,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^{10}) : \mathbb{Z}_{11}$
	QSRD(22,6,4,0;6,4,2,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^{10}) : \mathbb{Z}_{11}$
	QSRD(22,10,0,4;6,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^{10} : (\mathbb{Z}_{11} : \mathbb{Z}_5))$
	QSRG(22,2,0;1,0)	2	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_4, D_{22}$
	QSRG(22,3,0;2,1,0)	2	D_{22}
	QSRG(22,4,0;3,2,1,0)	2	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_4, D_{22}$
	QSRG(22,4,0;4,2,0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^{10} : \mathbb{Z}_{11}) : \mathbb{Z}_2)$
	QSRG(22,4,0;2,1,0)	4	D_{22}
	QSRG(22,5,0;4,3,2,1,0)	2	D_{22}
	QSRG(22,5,0;2,1,0)	2	D_{22}
	QSRG(22,5,0;3,2,1,0)	2	D_{22}
	QSRG(22,5,0;2,0)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(22,6,0;3,0)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(22,6,2;4,2,1,0)	2	D_{22}
	QSRG(22,6,0;4,2,1,0)	2	D_{22}
	QSRG(22,6,0;4,3,2,0)	3	D_{22}
	QSRG(22,6,2;2,1,0)	1	D_{22}
	QSRG(22,6,0;5,4,3,2,1,0)	1	D_{22}
	QSRG(22,6,0;4,3,2,1,0)	2	D_{22}
	QSRG(22,6,2;3,2,1,0)	1	D_{22}
	QSRG(22,7,0;6,5,4,3,0)	1	D_{22}
	QSRG(22,7,0;5,4,3,0)	1	D_{22}
	QSRG(22,7,0;5,4,3,2,1)	1	D_{22}
	QSRG(22,7,0;6,5,4,3,2,1,0)	1	D_{22}
	QSRG(22,8,0;8,6,4,2)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^{10}) : \mathbb{Z}_{11}) : \mathbb{Z}_2$
	QSRG(22,8,0;7,6,5,0)	1	D_{22}
	QSRG(22,9,0;8,7,0)	1	D_{22}
	QSRG(22,10,0;9,0)	1	$\mathbb{Z}_2 \times S_{11}$

Tablica 4.15: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 21$ i neregularnih permutacijskih grupa stupnja $n = 22$

Tranzitivne permutacijske reprezentacije cikličke grupe \mathbb{Z}_{22} i diedralne grupe D_{11} stupnja 22 su regularne, odnosno grupa djeluje na skup $\Omega = \{1, \dots, 22\}$ u 22 podorbite duljine 1. Kako su u tablici na poveznici [10] navedeni parametri usmjerenih jako regularnih grafova na 22 vrha sa $k = 9$ i $k = 12$, čije postojanje još nije dokazano, za dobivene podorbite regularnih tranzitivnih permutacijskih grupa \mathbb{Z}_{22} i D_{11} napravili smo sve moguće unije po devet i po 12 podorbite i iskoristili konstrukciju iz teorema 2.3.4.

Kao rezultat dobili smo grafove i usmjerene grafove navedene u tablici 4.16. Uzimajući navedene unije kao skupove izlaznih susjeda vrha $\alpha \in \Omega$ konstrukcijom nismo dobili usmjerene jako regularne grafove s parametrima $(22, 9, 3, 4, 6)$ i $(22, 12, 6, 8, 8)$, kao ni 12-regularne usmjerene kvazi-jako regularne grafove.

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
22	QSRD(22,9,5,4;4,3)	1	D_{22}
	QSRG(22,9,0;8,7,0)	1	D_{22}
	QSRD(22,9,7,0;9,8,7,0)	4	\mathbb{Z}_{22}
	QSRD(22,9,8,0;9,8,7,0)	1	\mathbb{Z}_{22}

Tablica 4.16: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa grupa \mathbb{Z}_{22} i D_{11} na 22 točke

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
23	QSRD(23,1,0,0;1,0)	1	\mathbb{Z}_{23}
	QSRD(23,2,0,0;2,1,0)	9	\mathbb{Z}_{23}
	QSRD(23,3,0,0;3,2,1,0)	7	\mathbb{Z}_{23}
	QSRD(23,3,0,0;2,1,0)	28	\mathbb{Z}_{23}
	QSRD(23,3,2,0;2,1,0)	7	\mathbb{Z}_{23}
	QSRD(23,3,2,0;3,2,1,0)	1	\mathbb{Z}_{23}
	QSRD(23,4,0,0;4,3,2,1,0)	5	\mathbb{Z}_{23}
	QSRD(23,4,0,0;3,2,1,0)	25	\mathbb{Z}_{23}
	QSRD(23,4,2,0;3,2,1,0)	1	\mathbb{Z}_{23}
	QSRD(23,4,2,0;4,3,2,1,0)	1	\mathbb{Z}_{23}
	QSRD(23,4,0,0;4,2,1,0)	10	\mathbb{Z}_{23}
	QSRD(23,4,2,0;2,1,0)	9	\mathbb{Z}_{23}
	QSRD(23,4,2,0;4,2,1,0)	5	\mathbb{Z}_{23}
	QSRD(23,4,0,0;2,1,0)	5	\mathbb{Z}_{23}
	QSRD(23,5,0,0;5,4,3,2,1,0)	3	D_{23}
	QSRD(23,5,0,0;4,3,2,1,0)	9	\mathbb{Z}_{23}
	QSRD(23,5,2,0;4,3,2,1,0)	29	\mathbb{Z}_{23}
	QSRD(23,5,2,0;5,4,3,2,1,0)	1	\mathbb{Z}_{23}
	QSRD(23,5,2,0;5,3,2,1,0)	2	\mathbb{Z}_{23}
	QSRD(23,5,2,0;5,2,1,0)	3	\mathbb{Z}_{23}
	QSRD(23,5,4,0;4,3,2,1,0)	8	\mathbb{Z}_{23}
	QSRD(23,5,4,0;5,4,3,2,1,0)	1	\mathbb{Z}_{23}
	QSRD(23,5,4,0;3,2,1,0)	6	\mathbb{Z}_{23}
	QSRD(23,5,2,0;3,2,1,0)	2	\mathbb{Z}_{23}
	QSRD(23, 5, 0, 0 ; 5,3,2,1,0)	1	\mathbb{Z}_{23}
	QSRD(23,6,6,2;3,2,1,0)	1	D_{23}
	QSRD(23,6,0,0;6,5,4,3,2,1,0)	1	\mathbb{Z}_{23}
	QSRD(23,6,2,0;5,4,3,2,1,0)	2	\mathbb{Z}_{23}
	QSRD(23,6,2,0;6,5,4,3,2,1,0)	1	\mathbb{Z}_{23}
	QSRD(23,6,2,0;6,4,3,2,1,0)	2	\mathbb{Z}_{23}
	QSRD(23,6,4,0;4,3,2,1,0)	3	\mathbb{Z}_{23}
	QSRD(23,6,4,0;5,4,3,2,1,0)	10	\mathbb{Z}_{23}
	QSRD(23,6,4,0;6,5,4,3,2,1,0)	1	\mathbb{Z}_{23}
	QSRD(23,6,4,0;6,4,3,2,1,0)	2	\mathbb{Z}_{23}
	QSRD(23,7,2,2;5,3,2,1,0)	1	\mathbb{Z}_{23}
	QSRD(23,7,4,0;7,6,5,4,3,2,1,0)	1	\mathbb{Z}_{23}
	QSRD(27,7,6,0;6,5,4,3,2,1,0)	2	\mathbb{Z}_{23}
	QSRD(23,7,6,0;5,4,3,2,1,0)	1	\mathbb{Z}_{23}
	QSRD(23,7,6,0;7,6,5,4,3,2,1,0)	1	\mathbb{Z}_{23}
	QSRD(23,7,0,2;5,4,3,2,1,0)	1	\mathbb{Z}_{23}
	QSRD(23,7,0,2;5,4,3,2,0)	1	\mathbb{Z}_{23}
	QSRG(23,2,0;1,0)	1	D_{23}
	QSRG(23,4,0;3,2,1,0)	1	D_{23}
	QSRG(23,4,0;2,1,0)	3	D_{23}
	QSRG(23,6,0;5,4,3,2,1,0)	1	D_{23}
	QSRG(23,6,0;4,3,2,1,0)	3	D_{23}
	QSRG(23,6,0;3,2,1,0)	1	D_{23}
QSRG(23,6,2;2,1,0)	1	D_{23}	
QSRG(23,8,0;7,6,5,4,3,2,1)	1	D_{23}	
DRT(23,11,5,6)	1	$\mathbb{Z}_{23} : \mathbb{Z}_{11}$	
24	DSRG(24,5,1,1,2)	4	$\mathbb{Z}_2 \times S_4, (2), A_4 : \mathbb{Z}_4, (2)$
	DSRG(24,6,0,2,2)	1	98304
	DSRG(24,7,2,2,3)	1	98304
	DSRG(24,8,0,4,4)	1	1146617856
	DSRG(24,9,2,4,7)	2	$\mathbb{Z}_2 \times S_4, (2),$
	DSRG(24,10,4,4,8)	6	$\mathbb{Z}_2 \times S_4, (6)$
	DSRG(24,11,6,4,7)	6	1146617856, 98304, (2), 49152, $\mathbb{Z}_2 \times S_4, (2)$
	DSRG(24,11,5,5,6)	10	$(C_6 \times S_3) : \mathbb{Z}_2, (2), \mathbb{Z}_2 \times S_4, (2),$ $A_5 : \mathbb{Z}_4, (2), (S_3 \times S_3) : \mathbb{Z}_2, (4)$
	DSRG(24,11,7,3,8)	1	13436928

Tablica 4.17: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 23$ i tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(S) ili Aut(S)
24	QSRD(24, 1, 0, 0; 1, 0)	5	264539520, 2949120, 31104, $\mathbb{Z}_8 \times ((\mathbb{Z}_8 \times \mathbb{Z}_8) : \mathbb{Z}_3) : \mathbb{Z}_2$, $\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2))$
	QSRD(24, 2, 1, 0; 2, 1, 0)	6	31104, $(2) \mathbb{Z}_2 \times \mathbb{Z}_4 \times ((\mathbb{Z}_4 \times \mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2$, $\mathbb{Z}_8 \times ((\mathbb{Z}_8 \times \mathbb{Z}_8) : \mathbb{Z}_3) : \mathbb{Z}_2$, $\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2))$, $\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_2^4 : \mathbb{Z}_2))$
	QSRD(24, 2, 1, 0; 1, 0)	4	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2 : \mathbb{Z}_2$, $((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_3, (\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2, 31104$
	QSRD(24, 2, 0, 0; 2, 0)	4	7962624, 1572864, 294912, 49152
	QSRD(24, 2, 0, 0; 1, 0)	12	$((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, (\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_4^2 : \mathbb{Z}_2), (2)$, $((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (2), \mathbb{Z}_2 \times S_4, (\mathbb{Z}_3 \times Q_8) : \mathbb{Z}_2, (\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2$, $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_3, (2)$, $GL(2, 3), (2), (S_4 \times S_4) : \mathbb{Z}_2, (2)]$
	QSRD(24, 2, 0, 0; 2, 1, 0)	17	24576, $\mathbb{Z}_8 \times ((\mathbb{Z}_8 \times \mathbb{Z}_8) : \mathbb{Z}_3) : \mathbb{Z}_2$, $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2))$, (7), $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$, (7), $\mathbb{Z}_8 \times S_3, (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_2^4 : \mathbb{Z}_2, (2), \mathbb{Z}_3 \times QD_8, \mathbb{Z}_3 \times D_8, (2)$
	QSRD(24, 3, 2, 1; 1, 0)	2	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2 : \mathbb{Z}_2$, $(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$
	QSRD(24, 3, 2, 0; 3, 2, 0)	2	24576, $\mathbb{Z}_8 \times ((\mathbb{Z}_8 \times \mathbb{Z}_8) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(24, 3, 1, 0; 3, 2, 1, 0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_2^4 : \mathbb{Z}_2))$, $\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2))$
	QSRD(24, 3, 1, 0; 2, 0)	4	$((\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3$, $\mathbb{Z}_2 \times (((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, $((\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, (2)$
	QSRD(24, 3, 1, 0; 2, 1, 0)	28	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2))$, (2) $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, ((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$, $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3$, $((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (2), A_4 : \mathbb{Z}_4, \mathbb{Z}_8 \times S_3$, $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2), \mathbb{Z}_2^4 : \mathbb{Z}_2, D_4 \times S_3, (2), \mathbb{Z}_3 \times QD_8$, $\mathbb{Z}_3 \times D_8, (\mathbb{Z}_3 \times Q_8) : \mathbb{Z}_2, (\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2, (2) GL(2, 3), (2)$, $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_3$, $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2 : \mathbb{Z}_2, (2)$, $\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4, (2), \mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3, \mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (2)$, $\mathbb{Z}_2 \times S_4, (2)$
	QSRD(24, 3, 2, 0; 2, 1, 0)	26	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_2^4 : \mathbb{Z}_2))$, (2), $\mathbb{Z}_3 \times (\mathbb{Z}_3 : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2)$, (2), $(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$, (3), $((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_3, (3), (\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$, (2), $\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2))$, (3), $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (3), $((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (2), (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2)$, $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2, (2), \mathbb{Z}_2 \times S_4, \mathbb{Z}_6 \times D_4$, $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3, \mathbb{Z}_3 \times D_8, (2), \mathbb{Z}_8 \times S_3, (2)]$
	QSRD(24, 3, 1, 0; 1, 0)	8	$\mathbb{Z}_2 \times S_4, (4), A_4 : \mathbb{Z}_4, (S_4 \times S_4) : \mathbb{Z}_2, (4)$, $\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4, (2)$
	QSRD(24, 3, 2, 0; 1, 0)	5	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$, $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$, $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2, (2), (2), D_4 \times S_3$
	QSRD(24, 3, 2, 1; 2, 0)	1	31104
	QSRD(24, 3, 0, 0; 3, 2, 0)	5	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2)$, 10368, $\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2))$, $\mathbb{Z}_6 \times S_4$, $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(24, 3, 2, 0; 3, 1, 0)	2	$((A_4 : \mathbb{Z}_4) \times (A_4 : \mathbb{Z}_4)) : \mathbb{Z}_2, ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(24, 3, 0, 0; 2, 1, 0)	59	$(\mathbb{Z}_4 \times \mathbb{Z}_4 \times A_4 \times A_4) : \mathbb{Z}_2, ((\mathbb{Z}_4 \times \mathbb{Z}_4 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_3$ $((A_4 : \mathbb{Z}_4) \times (A_4 : \mathbb{Z}_4)) : \mathbb{Z}_2$, $\mathbb{Z}_3 : ((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2, (2)$, $\mathbb{Z}_6 \times D_4, (\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_4$, $\mathbb{Z}_3 \times ((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2, (2), ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (4), \mathbb{Z}_3 \times ((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2)$, (5), $\mathbb{Z}_8 \times S_3, (5), (((\mathbb{Z}_2 \times (\mathbb{Z}_4 : \mathbb{Z}_4)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3$, $\mathbb{Z}_4 \times A_4, (2), (((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, \mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4, (4)$, $((\mathbb{Z}_2 \times ((\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3$, $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_8 \times A_4, (4)$, $A_4 : \mathbb{Z}_8, (2), ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (4) (\mathbb{Z}_3 \times Q_8) : \mathbb{Z}_2, (2)$, $\mathbb{Z}_3 \times QD_8, (5), \mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (3), $\mathbb{Z}_2^4 : \mathbb{Z}_2, (4)$, $(\mathbb{Z}_3 : \mathbb{Z}_8) : \mathbb{Z}_2, (3), \mathbb{Z}_3 \times (\mathbb{Z}_8 : \mathbb{Z}_2), (2)$, $\mathbb{Z}_3 \times D_8, (2), \mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4), (2)$
	QSRD(24, 3, 0, 1; 3, 1, 0)	1	82944
	QSRD(24, 3, 0, 0; 3, 2, 1, 0)	12	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2))$, $A_4 : \mathbb{Z}_4$, $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3, \mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4), (2) \mathbb{Z}_3 \times D_8, (2) A_4 : \mathbb{Z}_8, (2)$, $\mathbb{Z}_8 \times S_3, (2), (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(24, 3, 2, 0; 3, 2, 1, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2))$
	QSRD(24, 3, 0, 0; 3, 0)	2	53747712, 13436928
	QSRD(24, 3, 0, 0; 3, 1, 0)	4	$Q_8 \times S_3, \mathbb{Z}_3 \times SL(2, 3), (\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2, \mathbb{Z}_3 \times S_4$
	QSRD(24, 3, 0, 0; 1, 0)	4	$\mathbb{Z}_4 \times A_4, (2), \mathbb{Z}_2 \times S_4, A_4 : \mathbb{Z}_4, (2)$
	QSRD(24, 4, 3, 1; 3, 0)	1	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2 : \mathbb{Z}_2$
	QSRD(24, 4, 3, 0; 4, 3, 2, 1, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2))$

Tablica 4.18: Grafovi dobiveni konstrukcijom iz tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
24	QSRD(24,4,2,0;4,3,2,0)	4	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$, $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, $\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2))$, (2)
	QSRD(24,4,3,0;4,3,2,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : (\mathbb{Z}_2^4 : \mathbb{Z}_2))$, $\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_2^4 : \mathbb{Z}_2))$
	QSRD(24,4,2,0;4,2,0)	4	294912, (2), 49152, (2)
	QSRD(24,4,3,0;2,1,0)	40	$\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (4), $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2$, (2), $D_4 \times S_3$, (9), $\mathbb{Z}_2 \times S_4$, (9), $\mathbb{Z}_6 \times S_4$, (2), $\mathbb{Z}_6 \times D_4$, (2), $\mathbb{Z}_3 \times D_8$, (2), $S_4 \times S_3$, $\mathbb{Z}_3 \times S_4$, $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, (16)
	QSRD(24,4,1,0;4,2,1,0)	6	$\mathbb{Z}_6 \times D_4$, (2), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (2), $\mathbb{Z}_3 \times QD_8$, $\mathbb{Z}_3 \times D_8$
	QSRD(24,4,2,0;2,0)	24	49152, (2) $\mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4$, $\mathbb{Z}_2 \times A_4 \times D_4$, (2) 294912, $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, $\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4$, (16)
	QSRD(24,4,2,0;3,2,1,0)	230	$D_4 \times S_3$, (2) $\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4$, (18), (18), $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$, (48), $\mathbb{Z}_6 \times D_4$, (8), $\mathbb{Z}_8 \times S_3$, (8), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (40), $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2$, (4), $\mathbb{Z}_3 \times D_8$, (4), $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (96), $\mathbb{Z}_2 \times S_4$, (2), $\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)$, $(\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4 : \mathbb{Z}_3$,
	QSRD(24,4,2,0;2,1,0)	363	$A_4 \times D_8$, (2), $(A_4 \times D_4) : \mathbb{Z}_2$, (2), $D_4 \times S_3$, (7), (2), $\mathbb{Z}_2 \times S_4$, (41), $A_4 \times D_4$, $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2$, (11), $A_4 : \mathbb{Z}_4$, $\mathbb{Z}_2 \times \mathbb{Z}_2 \times S_4$, (2), $\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2)$, (2), $D_4 \times A_4$, (26), $\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4$, (18), $((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2) \times S_3$, (41), $((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (73), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (24), $S_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (4), $\mathbb{Z}_3 \times ((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$, (11), $\mathbb{Z}_8 \times A_4$, (8), $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2$, (8), $(\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3$, (8), $S_3 \times QD_8$, (14), $\mathbb{Z}_2^4 : \mathbb{Z}_2$, (8), $\mathbb{Z}_3 : ((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2)$, (20), $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$, (8), $\mathbb{Z}_3 \times ((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2)$, (5), $GL(2,3)$, (8), $(\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2 \times S_3$, (20), $\mathbb{Z}_6 \times D_4$, (8), $(\mathbb{Z}_3 \times Q_8) : \mathbb{Z}_2$, (4), $\mathbb{Z}_8 \times S_3$, (8), $QD_8 \times S_3$, (6)
	QSRD(24,4,1,0;3,2,1,0)	33	$A_4 : \mathbb{Z}_4$, (2), $D_4 \times S_3$, (2), $\mathbb{Z}_3 \times D_8$, (2), $\mathbb{Z}_8 \times S_3$, $\mathbb{Z}_3 \times SL(2,3)$, $S_4 \times S_3$, $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, (24)
	QSRD(24,4,1,0;2,1,0)	54	$\mathbb{Z}_8 \times S_3$, (2), $\mathbb{Z}_2 \times (\mathbb{Z}_4^2 : \mathbb{Z}_3)$, (2), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4$, (8), $A_4 \times D_4$, (4), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (4), $\mathbb{Z}_3 \times QD_8$, (2), $A_4 : \mathbb{Z}_4$, $(\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4 : \mathbb{Z}_3$, (2), $\mathbb{Z}_4 \times S_4$, (4), $(\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2$, (2), $\mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4)$, (4), $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2$, (18), $\mathbb{Z}_2 \times S_4$, (18)
	QSRD(24,4,3,0;3,2,1,0)	50	$\mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4)$, (2), $\mathbb{Z}_4 \times S_4$, (4), $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2$, (2), $(\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2$, (2) (2), (4) $\mathbb{Z}_8 \times S_3$, $\mathbb{Z}_2 \times S_4$, (2)
	QSRD(24,4,1,0;3,2,0)	6	$\mathbb{Z}_{12} \times S_3$, $\mathbb{Z}_4 \times ((S_3 \times S_3) : \mathbb{Z}_2)$, (36)
	QSRD(24,4,2,0;4,2,1,0)	97	$\mathbb{Z}_6 \times D_4$, (2) 10368, (2) $\mathbb{Z}_6 \times S_4$, (2) $\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)$, $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (5), $S_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, $\mathbb{Z}_3 : (\mathbb{Z}_2^3 : \mathbb{Z}_2^2)$, $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, $\mathbb{Z}_4 \times S_4$, (16), $A_4 : Q_8$, (32), $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$, (24), $\mathbb{Z}_3 \times D_8$, (8), $\mathbb{Z}_8 \times S_3$, (4), $\mathbb{Z}_2^4 : \mathbb{Z}_2$, (4)
	QSRD(24,4,1,0;3,1,0)	1	10368
	QSRD(24,4,3,0;1,0)	3	$D_4 \times S_3$, (2) $A_4 \times S_3$
	QSRD(24,4,0,0;4,0)	2	3439853568, 1146617856
	QSRD(24,4,1,0;1,0)	2	$A_4 : \mathbb{Z}_4$, $\mathbb{Z}_2 \times S_4$
	QSRD(24,4,2,1;2,1,0)	80	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$, $\mathbb{Z}_2 \times S_4$, (3), $(S_4 \times S_4) : \mathbb{Z}_2$, (76), $((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_3$, (2)
	QSRD(24,4,1,1;2,1,0)	2	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$, $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, $\mathbb{Z}_3 \times D_{12}$, $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2$, (16)
	QSRD(24,4,3,0;3,2,0)	1	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$
	QSRD(24,4,3,0;3,1,0)	19	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$, $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, $\mathbb{Z}_3 \times D_{12}$, $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2$, (16)
	QSRD(24,4,0,0;4,2,1,0)	187	$\mathbb{Z}_3 \times S_4$, $((\mathbb{Z}_2 \times \mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$, $(\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_4$, $S_3 \times QD_8$, $\mathbb{Z}_8 \times S_3$, (9), $(\mathbb{Z}_3 \times \mathbb{Z}_8) : \mathbb{Z}_2$, (24), $\mathbb{Z}_3 \times (\mathbb{Z}_8 : \mathbb{Z}_2)$, (40), (40), (9), $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (8), $\mathbb{Z}_2^4 : \mathbb{Z}_2$, (8), $Q_8 \times S_3$, (24), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, (8), $\mathbb{Z}_3 : (\mathbb{Z}_8 : \mathbb{Z}_2^2)$, (14), $\mathbb{Z}_3 \times QD_8$, (16), $\mathbb{Z}_3 \times D_8$, (8),
	QSRD(24,4,0,0;4,2,0)	53	98304, (2), 49152, (7), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (16), $\mathbb{Z}_6 \times S_4$, (28), 49152, (2), 98304, (2), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4$, (32), $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_4) : \mathbb{Z}_2) : \mathbb{Z}_3$, (5), $A_4 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8), $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3$, (7), $((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) \times A_4$, (32)
	QSRD(24,4,0,0;2,1,0)	390	$A_4 : \mathbb{Z}_4$, (9), $(\mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4)) : \mathbb{Z}_2$, (41), $(A_4 : Q_8) : \mathbb{Z}_2$, (2), $A_4 \times Q_8$, $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times Q_8) : \mathbb{Z}_3$, $A_4 \times QD_8$, (37), (2), $\mathbb{Z}_2^4 : \mathbb{Z}_2$, (37), $\mathbb{Z}_8 \times A_4$, (40), $A_4 : \mathbb{Z}_8$, (16), $\mathbb{Z}_3 : (\mathbb{Z}_2^3 : \mathbb{Z}_4)$, (20), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8), $\mathbb{Z}_3 \times (\mathbb{Z}_8 : \mathbb{Z}_2)$, (56), $\mathbb{Z}_2 \times (\mathbb{Z}_4^2 : \mathbb{Z}_3)$, (32), $A_4 : Q_8$, (32), $(\mathbb{Z}_3 \times Q_8) : \mathbb{Z}_2$, (4), $(\mathbb{Z}_3 : \mathbb{Z}_8) : \mathbb{Z}_2$, (48), $(\mathbb{Z}_8 : \mathbb{Z}_2) \times S_3$, (24), $\mathbb{Z}_4 \times S_4$, (16), $GL(2,3)$, (2)
	QSRD(24,4,0,1;4,2,1,0)	1	$((A_4 : \mathbb{Z}_4) \times (A_4 : \mathbb{Z}_4)) : \mathbb{Z}_2$
	QSRD(24,4,0,0;4,1,0)	25	$SL(2,3) : \mathbb{Z}_4$, $Q_8 \times S_3$, (24)
	QSRD(24,4,0,1;4,1,0)	1	$SL(2,3) : \mathbb{Z}_4$
	QSRD(24,4,0,0;3,2,1,0)	262	$\mathbb{Z}_6 \times S_4$, (15), $\mathbb{Z}_6 \times (\mathbb{Z}_3^3 : \mathbb{Z}_4)$, $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$, (48), $\mathbb{Z}_3 \times (\mathbb{Z}_3 : \mathbb{Z}_8)$, (8), $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (28), $\mathbb{Z}_4 \times A_4$, (32), $\mathbb{Z}_8 \times S_3$, (20), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (48), $((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4) : \mathbb{Z}_3 : \mathbb{Z}_4$, (12), $(\mathbb{Z}_3 \times Q_8) : \mathbb{Z}_2$, (4), $\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : \mathbb{Z}_8)$, (40), $\mathbb{Z}_3 \times SL(2,3)$, (4), $GL(2,3)$, (2)

Tablica 4.19: Grafovi dobiveni konstrukcijom iz tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(S) ili Aut(S)
24	QSRD(24, 4, 3, 0; 4, 3, 1, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : D_4)$
	QSRD(24, 4, 0, 0; 4, 3, 1, 0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : Q_8), (\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2 \times Q_8) : \mathbb{Z}_2)$
	QSRD(24, 4, 0, 0; 4, 3, 2, 0)	21	$\mathbb{Z}_4 \times ((S_3 \times S_3) : \mathbb{Z}_2), \mathbb{Z}_8 \times S_3, (4),$ $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (4), \mathbb{Z}_2^4 : \mathbb{Z}_2, (4), \mathbb{Z}_{12} \times S_3, (8)$
	QSRD(24, 4, 2, 0; 4, 1, 0)	1	$(\mathbb{Z}_2 : ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_2) = (((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4) : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(24, 4, 0, 0; 3, 1, 0)	39	$((\mathbb{Z}_2^3 : \mathbb{Z}_2^2) : (\mathbb{Z}_3 \times \mathbb{Z}_3)) : \mathbb{Z}_2, (15),$ $\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : D_4), (20), ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (4)$
	QSRD(24, 4, 2, 0; 3, 1, 0)	49	$(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2, (37), (((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4) : \mathbb{Z}_3) : \mathbb{Z}_4, (12)$
	QSRD(24, 4, 0, 0; 3, 2, 0)	9	$\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (9)$
	QSRD(24, 4, 0, 0; 4, 3, 2, 1, 0)	1	$\mathbb{Z}_2^4 : \mathbb{Z}_2$
	QSRD(24, 5, 3, 2; 4, 2, 0)	743	294912, (339), 49152, (404)
	QSRD(24, 5, 3, 2; 2, 0)	1325	294912, 49152, (1188), $(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2), (60), (S_4 \times S_4) : \mathbb{Z}_2, (76)$
	QSRD(24, 5, 2, 1; 2, 1, 0)	25	$\mathbb{Z}_2 \times S_4, (9), A_4 : \mathbb{Z}_4, (16)$
	QSRD(24, 5, 3, 2; 4, 1, 0)	77	$((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_3, (76),$ $\mathbb{Z}_2 \times S_4, (3)$
	QSRD(24, 5, 3, 0; 2, 0)	433	$\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2), (241), \mathbb{Z}_2 \times S_4, (4),$ $\mathbb{Z}_2 \times A_4 \times S_4, (58), (58), \mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4, (16), \mathbb{Z}_2 \times S_4 \times A_4, (50),$ $\mathbb{Z}_2 \times A_4 \times D_4, (50), (241), (241), D_4 \times S_3, (4), \mathbb{Z}_2 \times D_4 \times A_4, (10)$
	QSRD(24, 5, 1, 0; 4, 2, 0)	837	$\mathbb{Z}_2 \times (((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3,$ $((\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, (144), 82944, (636),$ $\mathbb{Z}_6 \times S_4, (28), \mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (16), (\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2, (12),$
	QSRD(24, 5, 3, 0; 4, 2, 1, 0)	149	$((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (23),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8), A_4 : \mathbb{Z}_4, (8), \mathbb{Z}_3 \times D_8, (8),$ $D_4 \times S_3, (12), (\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2, (4),$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (24),$ $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2, (12), \mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4, (16),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8), (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (4),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3, (8), \mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8),$ $((((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2, (6)$
	QSRD(24, 5, 3, 0; 3, 2, 1, 0)	703	$((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (23),$ $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (24),$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, (448), (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (4),$ $D_4 \times S_3, (8), \mathbb{Z}_8 \times S_3, (8), (\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2, (4),$ $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2), (56),$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (24),$ $\mathbb{Z}_2 \times S_4, (14), (((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (6),$ $\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4, (48), (\mathbb{Z}_2 \times \mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2, (12),$ $\mathbb{Z}_3 \times D_{12}, (16)$
	QSRD(24, 5, 4, 0; 5, 4, 0)	263	$\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : (\mathbb{Z}_2^4 : \mathbb{Z}_2)), 18432, (218), \mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2)), (44)$
	QSRD(24, 5, 1, 0; 4, 3, 1, 0)	1	$SL(2, 3) : \mathbb{Z}_4$
	QSRD(24, 5, 1, 0; 2, 1, 0)	1	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$
	QSRD(24, 5, 1, 0; 4, 3, 2, 1, 0)	133	$\mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4), \mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8),$ $\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : \mathbb{Z}_8), (40), (40), \mathbb{Z}_6 \times (\mathbb{Z}_3^3 : \mathbb{Z}_4), (48),$ $(S_3 \times S_3) : \mathbb{Z}_2, (12), \mathbb{Z}_2 \times ((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_4), (24)$
	QSRD(24, 5, 1, 0; 4, 3, 2, 0)	1	$\mathbb{Z}_6 \times D_4$
	QSRD(24, 5, 3, 2; 4, 2, 1, 0)	53	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2)), (45), \mathbb{Z}_3 \times QD_8, (4), \mathbb{Z}_3 \times D_8, (4)$
	QSRD(24, 5, 3, 0; 4, 2, 0)	449	$\mathbb{Z}_2 \times (((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (349),$ $S_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (4), ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2) \times S_3, (76),$ $\mathbb{Z}_2 \times (((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3), (12),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), \mathbb{Z}_2 \times \mathbb{Z}_6 \times S_3, (48),$ $\mathbb{Z}_6 \times D_4, (8), \mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8),$ $(\mathbb{Z}_6 \times S_3) : \mathbb{Z}_2, \mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (16),$
	QSRD(24, 5, 4, 0; 4, 3, 2, 0)	65	$\mathbb{Z}_2 \times S_3 \times S_3, (48), (S_3 \times S_3) : \mathbb{Z}_2, (24), \mathbb{Z}_2 \times S_4, (8), (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (48),$ $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (48), \mathbb{Z}_8 \times S_3, (4)$
	QSRD(24, 5, 4, 0; 4, 3, 2, 1, 0)	197	$\mathbb{Z}_3 \times D_{12}, \mathbb{Z}_{12} \times S_3, (8), D_4 \times S_3, (16),$ $S_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (4), ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) \times S_3, (48), (\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2, (28),$ $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (28), \mathbb{Z}_4 \times S_4, (12), \mathbb{Z}_8 \times S_3, (8),$ $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2, (12), \mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8),$ $\mathbb{Z}_3 \times D_8, (4), ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (4), \mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3, (8)$
	QSRD(24, 5, 2, 0; 4, 3, 2, 0)	621	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (112),$ $((\mathbb{Z}_4 \times \mathbb{Z}_2^5) : \mathbb{Z}_2) : \mathbb{Z}_3, (96), \mathbb{Z}_3 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2), (96),$ $\mathbb{Z}_6 \times D_4, (32), (((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (144),$ $\mathbb{Z}_8 \times A_4, (32), (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (4), \mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4, (64), \mathbb{Z}_8 \times S_3, (8)$
	QSRD(24, 5, 4, 0; 4, 2, 1, 0)	549	$\mathbb{Z}_3 : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2), (217), \mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (24),$ $\mathbb{Z}_6 \times S_4, (14), \mathbb{Z}_3 \times (((\mathbb{Z}_2^3 : \mathbb{Z}_2^2) : \mathbb{Z}_2) : \mathbb{Z}_2), (18),$ $\mathbb{Z}_3 \times (((A_4 \times A_4) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2, (44), \mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (16),$ $\mathbb{Z}_3 \times (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2), (14), ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (24),$ $\mathbb{Z}_3 \times (((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2) : \mathbb{Z}_2), (20), \mathbb{Z}_3 \times (((A_4 \times A_4) : \mathbb{Z}_4) : \mathbb{Z}_2), (22),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4, (16), \mathbb{Z}_8 \times S_4, (12), \mathbb{Z}_3 \times ((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2), (18),$ $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (24), \mathbb{Z}_8 \times A_4, (8), \mathbb{Z}_3 \times (\mathbb{Z}_4^2 : \mathbb{Z}_2), (12),$ $D_4 \times S_3, (8), \mathbb{Z}_6 \times D_4, (8), \mathbb{Z}_2 \times \mathbb{Z}_4 \times S_4, (24),$ $\mathbb{Z}_3 \times (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2, (6)$
	QSRD(24, 5, 2, 0; 4, 2, 1, 0)	277	$\mathbb{Z}_6 \times D_4, \mathbb{Z}_3 \times (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2), (30),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (56),$ $S_4 \times S_3, (24), \mathbb{Z}_3 \times ((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2), (34), \mathbb{Z}_3 \times (\mathbb{Z}_8 : \mathbb{Z}_2), (32),$ $(\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_4, (48), \mathbb{Z}_6 \times S_4, (28), (\mathbb{Z}_3 : \mathbb{Z}_8) : \mathbb{Z}_2, (24)$

Tablica 4.20: Grafovi dobiveni konstrukcijom iz tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(S) ili Aut(S)
24	QSRD(24,5,1,0;2,0)	13	$\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_4) : \mathbb{Z}_2) : \mathbb{Z}_3$, (5), $((\mathbb{Z}_2 \times (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, (7)
	QSRD(24,5,1,0;3,2,1,0)	39	$((\mathbb{Z}_2^3 \times \mathbb{Z}_2^2) : (\mathbb{Z}_3 \times \mathbb{Z}_3)) : \mathbb{Z}_2$, (15), $((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, (4), $\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : D_4)$, (20)
	QSRD(24,5,1,0;4,1,0)	1	82944
	QSRD(24,5,3,0;4,3,2,1,0)	233	$\mathbb{Z}_6 \times D_4$, (9), $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (24), $D_4 \times S_3$, (24), $\mathbb{Z}_8 \times S_3$, (4), $(\mathbb{Z}_6 \times S_3) : \mathbb{Z}_2$, (48), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, (8), $\mathbb{Z}_{12} \times S_3$, (24), $\mathbb{Z}_4 \times ((S_3 \times S_3) : \mathbb{Z}_2)$, (36), $\mathbb{Z}_3 \times D_{12}$, (32), $(\mathbb{Z}_3 : \mathbb{Z}_4) \times S_3$, (24)
	QSRD(24,5,2,0;3,2,1,0)	1147	$D_4 \times S_3$, (9), $((\mathbb{Z}_2 \times (\mathbb{Z}_4^2 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3$, (32), $((((\mathbb{Z}_2 \times (\mathbb{Z}_4 : \mathbb{Z}_4)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, (240), $\mathbb{Z}_3 : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2)$, (144), 10368, (66), $A_4 : \mathbb{Z}_4$, (8), $(\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)) : \mathbb{Z}_2$, (96), $\mathbb{Z}_2 \times S_4$, (8), $((((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, (80), $A_4 : \mathbb{Z}_8$, (16), $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$, (144), $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (48), $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$, (34), $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (24), $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2$, (24), $((((\mathbb{Z}_2 \times (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2$, (38), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (16), $(\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_4$, (24), $\mathbb{Z}_4 \times A_4$, (16), $((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, (24), $\mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4)$, (32)
	QSRD(24,5,1,0;5,3,2,1,0)	25	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : \mathbb{Z}_8)$, $\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8), $\mathbb{Z}_6 \times (\mathbb{Z}_3 : \mathbb{Z}_4)$, (16)
	QSRD(24,5,2,0;5,4,2,1,0)	49	$A_4 : \mathbb{Z}_4$, $A_4 : \mathbb{Z}_8$, (16), $\mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4)$, (32)
	QSRD(24,5,2,0;5,2,1,0)	73	$S_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, $Q_8 \times S_3$, (24), $\mathbb{Z}_8 \times S_3$, (4), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, (8), $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$, (20), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8), $\mathbb{Z}_3 \times D_8$, (4), $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (4)
	QSRD(24,5,4,0;5,4,2,1,0)	53	$(\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)) : \mathbb{Z}_2$, (17), $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$, (24), $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2$, (10), $((((\mathbb{Z}_2 \times (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2$, (2)
	QSRD(24,5,4,0;5,2,1,0)	53	$(\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)) : \mathbb{Z}_2$, (17), $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$, (24), $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2$, (6), $((((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2$, (6)
	QSRD(24,5,2,0;4,3,1,0)	73	10368
	QSRD(24,5,4,0;2,1)	25	$S_4 \times S_3$, (25)
	QSRD(24,5,4,0;5,4,2,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : D_4)$
	QSRD(24,5,3,0;5,3,2,0)	1	$\mathbb{Z}_3 \times D_4 \times S_3$
	QSRD(24,5,3,0;5,3,2,1,0)	33	$\mathbb{Z}_3 \times D_8$, $\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8), $\mathbb{Z}_3 \times D_{12}$, (16), $\mathbb{Z}_{12} \times S_3$, (8)
	QSRD(24,5,2,0;5,3,2,0)	17	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2)$, $\mathbb{Z}_8 \times S_3$, (4), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, (8), $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (4)
	QSRD(24,5,3,0;3,2,0)	1	$\mathbb{Z}_2 \times S_4$
	QSRD(24,5,1,0;5,2,1,0)	19	$\mathbb{Z}_6 \times S_4$, (15), $\mathbb{Z}_3 \times SL(2,3)$, (4)
	QSRD(24,5,4,0;2,1,0)	185	$D_4 \times S_3$, (61), $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (48), $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (24), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8), $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2$, (12), $(\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2$, (12), $\mathbb{Z}_3 \times QD_8$, (4), $\mathbb{Z}_6 \times D_4$, (16)
	QSRD(24,5,2,0;3,2,0)	201	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$, (193), $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$, (8), $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_3$
	QSRD(24,5,1,2;4,2,0)	1	$(\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)) : \mathbb{Z}_2$, (17), $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$, (24), $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2$, (8), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, (8), $\mathbb{Z}_4 \times A_4$, (16), $\mathbb{Z}_3 \times D_8$, (16), $\mathbb{Z}_8 \times S_3$, (16), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8), $((((\mathbb{Z}_2 \times (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2$, (4)
	QSRD(24,5,4,0;4,1,0)	211	$\mathbb{Z}_3 : (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2)$, $(\mathbb{Z}_3 \times S_4 \times S_4) : \mathbb{Z}_2$, (174), $\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2)$, (36), $D_4 \times S_3$
	QSRD(24,5,4,1;2,1,0)	1	$D_4 \times S_3$
	QSRD(24,5,0,0;5,4,2,0)	235	$\mathbb{Z}_3 \times (((A_4 \times A_4) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$, $\mathbb{Z}_3 \times (((\mathbb{Z}_3^3 : \mathbb{Z}_4) : \mathbb{Z}_2) : \mathbb{Z}_2)$, (20), $\mathbb{Z}_8 \times S_4$, (12), $\mathbb{Z}_3 \times (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$, (6), $\mathbb{Z}_3 \times (((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_2) : \mathbb{Z}_2)$, (18), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8), $\mathbb{Z}_3 \times (\mathbb{Z}_3 : Q_8)$, (16), $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2 \times Q_8) : \mathbb{Z}_2)$, (72), $\mathbb{Z}_3 \times (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2)$, (14), $\mathbb{Z}_3 \times ((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2)$, (18), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_4$, (24), $\mathbb{Z}_6 \times S_4$, (14), $\mathbb{Z}_3 \times (\mathbb{Z}_4^2 : \mathbb{Z}_2)$, (12)
	QSRD(24,5,0,0;4,2,1,0)	674	3072, (217), $((\mathbb{Z}_2 \times ((\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, (120), $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, (40), $((((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, (24), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4$, (16), $((\mathbb{Z}_4 \times \mathbb{Z}_2^3) : \mathbb{Z}_2) : \mathbb{Z}_3$, (24), $\mathbb{Z}_8 \times (\mathbb{Z}_4^2 : \mathbb{Z}_3)$, (32), $\mathbb{Z}_8 \times A_4$, (8)
	QSRD(24,5,1,0;4,2,0)	837	82944, (636), $\mathbb{Z}_2 \times (((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, $((\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3$, (144), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (16), $(\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2$, (12)
	QSRD(24,5,4,0;4,1,0)	211	3456, (174), $\mathbb{Z}_3 : (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2)$, (174), $\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2)$, (36)
	QSRD(24,5,3,2;2,0)	1325	49152, (1188), 294912, $(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$, (60), 1152, (76)

Tablica 4.21: Grafovi dobiveni konstrukcijom iz tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(S) ili Aut(S)
24	QSRD(24,5,3,0;3,2,1,0)	703	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, (448),$ $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (23), \mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (24),$ $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (4), D_4 \times S_3, (8), \mathbb{Z}_8 \times S_3, (8)$ $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2, (4), (\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2), (56),$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (24), \mathbb{Z}_2 \times S_4, (14)$ $((((\mathbb{Z}_2 \times (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (6)$ $\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4, (48), (\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2, (12), \mathbb{Z}_3 \times D_{12}, (16)$
	QSRD(24,5,2,0;4,3,2,0)	621	$((\mathbb{Z}_4 \times \mathbb{Z}_2^5) : \mathbb{Z}_2) : \mathbb{Z}_3, (96),$ $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2),$ $((((\mathbb{Z}_2 \times (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (112),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2), (96), \mathbb{Z}_6 \times D_4, (32),$ $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3, (144), \mathbb{Z}_8 \times A_4, (32),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (32), (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (4),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4, (64), \mathbb{Z}_8 \times S_3$
	QSRD(24,5,3,0;4,2,1,0)	149	$(\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2, (12),$ $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (23), \mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8),$ $A_4 : \mathbb{Z}_4, (8), \mathbb{Z}_3 \times D_8, (8), D_4 \times S_3, (12), (\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2, (4),$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (24), \mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4, (16),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8), (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (4),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3, (8), \mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8),$ $((((\mathbb{Z}_2 \times (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (6)$
	QSRD(24,5,4,0;5,2,1,0)	53	$(\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)) : \mathbb{Z}_2, (17),$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (24),$ $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (6),$ $((((\mathbb{Z}_2 \times (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (6)$
	QSRD(24,5,2,1;2,1,0)	25	$\mathbb{Z}_2 \times S_4, (9), A_4 : \mathbb{Z}_4, (16)$
	QSRD(24,5,3,0;2,1,0)	345	$\mathbb{Z}_2 \times S_4, (44), ((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (69),$ $\mathbb{Z}_2 \times ((A_4 : \mathbb{Z}_4) : \mathbb{Z}_2), (48), ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2,$ $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2, (4), (\mathbb{Z}_2 \times \mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2, (36),$ $\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2), (48), (((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (16)$
	QSRD(24,5,4,0;4,2,1,0)	549	$\mathbb{Z}_3 : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2), (217), \mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (24),$ $\mathbb{Z}_6 \times S_4, (14), \mathbb{Z}_3 \times ((\mathbb{Z}_2^3 : \mathbb{Z}_2^2) : \mathbb{Z}_2) : \mathbb{Z}_2, (18),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (16), \mathbb{Z}_3 \times (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2), (14),$ $((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (24), \mathbb{Z}_3 \times ((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2) : \mathbb{Z}_2, (20),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4, (16), \mathbb{Z}_8 \times S_4, (12), \mathbb{Z}_3 \times ((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2), (18), (12), (217), (18),$ $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (24), \mathbb{Z}_8 \times A_4, (8), \mathbb{Z}_3 \times (\mathbb{Z}_4^2 : \mathbb{Z}_2), (12), D_4 \times S_3, (8),$ $\mathbb{Z}_6 \times D_4, (8), \mathbb{Z}_2 \times \mathbb{Z}_4 \times S_4, (24), \mathbb{Z}_3 \times (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2, (6)$
	QSRD(24,5,0,0;5,4,2,0)	235	$\mathbb{Z}_3 \times ((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2) : \mathbb{Z}_2, (20), 3456, (20), \mathbb{Z}_8 \times S_4, (12),$ $(12), \mathbb{Z}_3 \times (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2, (6),$ $\mathbb{Z}_3 \times (((\mathbb{Z}_2^3 : \mathbb{Z}_2^2) : \mathbb{Z}_2) : \mathbb{Z}_2), (18), \mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8),$ $\mathbb{Z}_3 \times (\mathbb{Z}_3 : Q_8), (16), (\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2 \times Q_8) : \mathbb{Z}_2), (72),$ $\mathbb{Z}_3 \times (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2), (14), \mathbb{Z}_3 \times ((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2), (18),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_4, (24), \mathbb{Z}_6 \times S_4, (14), \mathbb{Z}_3 \times (\mathbb{Z}_4^2 : \mathbb{Z}_2), (12)$
	QSRD(24,5,2,0;3,2,0)	201	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (193), (\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2, (8)$
	QSRD(24,5,4,0;5,2,0)	257	1536
	QSRD(24,5,4,0;5,4,0)	263	18432, (218), 2592, (218), $\mathbb{Z}_3 \times (\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2)), (44),$
	QSRD(24,5,4,0;4,3,2,1,0)	197	$\mathbb{Z}_2 \times S_4, (8), (\mathbb{Z}_6 \times S_3) : \mathbb{Z}_2, \mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (16), \mathbb{Z}_2 \times S_3 \times S_3, (48),$ $(S_3 \times S_3) : \mathbb{Z}_2, (24), (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (48), \mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (48),$ $\mathbb{Z}_8 \times S_3, (4)$
	QSRD(24,5,2,0;5,4,2,1,0)	49	$A_4 : \mathbb{Z}_8, (16), A_4 : \mathbb{Z}_4, (16), \mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4), (32)$
	QSRD(24,5,4,0;5,4,1,0)	17	3072, $(\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_8, (16)$
	QSRD(24,5,1,0;4,2,0)	837	82944, (636), $\mathbb{Z}_2 \times (((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3,$ $((\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, (144), \mathbb{Z}_6 \times S_4, (28),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (16), (\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2, (12)$
	QSRD(24,5,0,0;4,2,1,0)	481	$((\mathbb{Z}_2 \times ((\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, (120), 3072, (217),$ $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3, (40),$ $((((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (24),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4, (16), ((\mathbb{Z}_4 \times \mathbb{Z}_2^3) : \mathbb{Z}_2) : \mathbb{Z}_3, (24),$ $\mathbb{Z}_8 \times (\mathbb{Z}_4^2 : \mathbb{Z}_3), (32)$
	QSRD(24,5,2,0;4,2,1,0)	277	$\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (56), \mathbb{Z}_6 \times D_4, \mathbb{Z}_3 \times (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2), (30),$ $S_4 \times S_3, (24), \mathbb{Z}_3 \times ((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2), (34), \mathbb{Z}_3 \times (\mathbb{Z}_8 : \mathbb{Z}_2), (32),$ $(\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_4, (48), \mathbb{Z}_6 \times S_4, (28), (\mathbb{Z}_3 : \mathbb{Z}_8) : \mathbb{Z}_2, (24)$
	QSRD(24,5,4,0;5,3,1,0)	1	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(24,5,0,0;2,1,0)	101	1536
	QSRD(24,5,0,0;3,2,1,0)	133	$\mathbb{Z}_3 : (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2), (33), \mathbb{Z}_3 : ((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2), (28),$ $(\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_4, (24), (\mathbb{Z}_3 : Q_8) : \mathbb{Z}_2, (24),$ $(\mathbb{Z}_3 : \mathbb{Z}_8) : \mathbb{Z}_2, (24)$
	QSRD(24,5,0,0;4,3,2,0)	137	$\mathbb{Z}_3 \times (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2), (24), \mathbb{Z}_3 \times ((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2), (25),$ $\mathbb{Z}_3 \times (\mathbb{Z}_3 : Q_8), (16), \mathbb{Z}_3 \times (\mathbb{Z}_8 : \mathbb{Z}_2), (16),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (16), ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (24),$ $\mathbb{Z}_3 \times QD_8, (8), \mathbb{Z}_{12} \times S_3, (8)$
	QSRD(24,5,0,0;5,4,0)	73	$\mathbb{Z}_8 \times S_4, 2880, (64), \mathbb{Z}_{12} \times S_3, (8)$

Tablica 4.22: Grafovi dobiveni konstrukcijom iz tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
24	QSRD(24,5,3,0;2,0)	433	$\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2)$, (241), $\mathbb{Z}_2 \times S_4$, (4), $\mathbb{Z}_2 \times A_4 \times S_4$, (58), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4$, (16), $\mathbb{Z}_2 \times S_4 \times A_4$, (50), $\mathbb{Z}_2 \times A_4 \times D_4$, (50) $D_4 \times S_3$, (4) 49152, (1188), 294912, $(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$, (60), 1152, (76)
	QSRD(24,5,3,2;2,0)	1325	
	QSRD(24,5,3,0;5,3,2,1,0)	33	$\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8), $\mathbb{Z}_3 \times D_8$, $\mathbb{Z}_3 \times D_{12}$, (16), $\mathbb{Z}_{12} \times S_3$, (8)]
	QSRD(24,5,0,0;5,3,2,0)	5	$\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2)$, $\mathbb{Z}_3 \times SL(2,3)$, (4)
	QSRD(24,5,0,0;4,1,0)	17	3072, $(\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_8$, (16)
	QSRD(24,5,4,0;2,1,0)	185	$\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (48), $D_4 \times S_3$, (61), $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (24), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8), $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2$, (12), $(\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2$, (12), $\mathbb{Z}_3 \times QD_8$, (4), $\mathbb{Z}_6 \times D_4$, (16)
	QSRD(24,5,2,0;4,3,2,1,0)	117	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$, (24), $(\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)) : \mathbb{Z}_2$, (17), $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$, (8), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, (8), $\mathbb{Z}_4 \times A_4$, (16), $\mathbb{Z}_3 \times D_8$, (16), $\mathbb{Z}_8 \times S_3$, (16), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8), $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$, (4),
	QSRD(24,5,3,2;4,2,0)	743	294912, (339), 49152, (404)
	QSRD(24,5,0,0;5,3,2,1,0)	89	$\mathbb{Z}_4 \times S_4$, $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (64), $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$, (8), $\mathbb{Z}_3 \times (\mathbb{Z}_3 : \mathbb{Z}_8)$, (16)
	QSRD(24,5,2,0;5,4,2,0)	9	$\mathbb{Z}_6 \times D_4$, $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8)
	QSRD(24,5,0,0;4,3,1,0)	1	$SL(2,3) : \mathbb{Z}_4$
	QSRD(24,5,3,0;4,3,2,1,0)	233	$(\mathbb{Z}_6 \times S_3) : \mathbb{Z}_2$, (48), $\mathbb{Z}_6 \times D_4$, (9), $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (24), $D_4 \times S_3$, (24), $\mathbb{Z}_8 \times S_3$, (4), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, (8), $\mathbb{Z}_{12} \times S_3$, (24), $\mathbb{Z}_4 \times ((S_3 \times S_3) : \mathbb{Z}_2)$, (36), $\mathbb{Z}_3 \times D_{12}$, (32) $(\mathbb{Z}_3 : \mathbb{Z}_4) \times S_3$, (24) $((\mathbb{Z}_6 \times \mathbb{Z}_2) \times S_3) \times S_3$, (76), $\mathbb{Z}_2 \times (((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, (349), $S_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (4),
	QSRD(24,5,3,0;4,2,0)	449	$\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3$, (12)
	QSRD(24,5,4,0;4,3,2,0)	65	$\mathbb{Z}_2 \times \mathbb{Z}_6 \times S_3$, (48), $\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (48), $\mathbb{Z}_6 \times D_4$, (8), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8)
	QSRD(24,5,1,0;5,3,2,1,0)	25	$\mathbb{Z}_6 \times (\mathbb{Z}_3 : \mathbb{Z}_4)$, (16), $\mathbb{Z}_3 \times (\mathbb{Z}_3 : \mathbb{Z}_8)$, $\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8)
	QSRD(24,5,0,0;5,2,0)	1	$A_5 : Q_8$
	QSRD(24,5,1,0;4,3,2,1,0)	133	$\mathbb{Z}_6 \times (\mathbb{Z}_3^3 : \mathbb{Z}_4)$, (48), $\mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4)$, $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8), $\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : \mathbb{Z}_8)$, (40), $(S_3 \times S_3) : \mathbb{Z}_2$, (12), $\mathbb{Z}_2 \times ((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_4)$, (24)
	QSRD(24,5,0,0;4,3,2,1,0)	109	$\mathbb{Z}_8 \times S_3$, (9), $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (28), $\mathbb{Z}_2 \times \mathbb{Z}_2$, (4), $\mathbb{Z}_3 \times (\mathbb{Z}_8 : \mathbb{Z}_2)$, (8), $(\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_8$, (24), $\mathbb{Z}_3 \times (\mathbb{Z}_3 : \mathbb{Z}_8)$, (8), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8), $\mathbb{Z}_3 \times QD_8$, (8)
	QSRD(24,5,1,0;5,2,1,0)	19	$\mathbb{Z}_6 \times S_4$, (15), $\mathbb{Z}_3 \times SL(2,3)$, (4)
	QSRD(24,5,4,0;3,2,1,0)	189	$((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) \times S_3$, (48), $\mathbb{Z}_3 \times D_{12}$, $\mathbb{Z}_{12} \times S_3$, (8), $D_4 \times S_3$, (16), $S_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (4), $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$, (28), $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (28), $\mathbb{Z}_4 \times S_4$, (12), $\mathbb{Z}_8 \times S_3$, (8), $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2$, (12), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8), $\mathbb{Z}_3 \times D_8$, (4), $(\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2$, \mathbb{Z}_3 , (4), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, (8)
	QSRD(24,5,4,0;5,4,2,1,0)	53	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$, (24), $(\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)) : \mathbb{Z}_2$, (17), $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$, (10), $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$, (2)
	QSRD(24,5,2,0;5,2,1,0)	73	$Q_8 \times S_3$, (24), $S_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (24), $\mathbb{Z}_8 \times S_3$, (4), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, (8), $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$, (20), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8), $\mathbb{Z}_3 \times D_8$, (4), $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (4)
	QSRD(24,5,2,0;5,3,2,0)	17	$\mathbb{Z}_8 \times S_3$, (4), $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2)$, $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, (8), $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (4)
	QSRD(24,5,2,0;2,1,0)	13	$((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, (13)
	QSRD(24,5,0,0;5,4,3,1,0)	9	$\mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4)$, $A_4 : \mathbb{Z}_8$, (8)
	QSRD(24,5,2,0;5,3,2,1,0)	9	$Q_8 \times S_3$, $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$, (8)
	QSRD(24,5,0,0;5,2,1,0)	9	$\mathbb{Z}_3 \times QD_8$, $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8)
	QSRD(24,5,1,0;3,2,1,0)	39	$\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : D_4)$, (20), $((\mathbb{Z}_2^3 : \mathbb{Z}_2^2) : (\mathbb{Z}_3 \times \mathbb{Z}_3)) : \mathbb{Z}_2$, (15), $((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, (4)
	QSRD(24,5,2,0;4,3,1,0)	73	10368
	QSRD(24,5,1,0;2,0)	13	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_4) : \mathbb{Z}_2) : \mathbb{Z}_3$, (5), 1536, (5), $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3$, (7)
	QSRD(24,5,4,0;2,1)	25	$S_4 \times S_3$
	QSRD(24,5,0,0;5,4,3,2,0)	5	$\mathbb{Z}_3 \times D_8$, (5)
	QSRD(24,5,0,1;5,1,0)	1	$SL(2,5)$
	QSRD(24,5,3,0;4,3,2,0)	9	$\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8)
	QSRD(24,5,4,0;3,2,0)	9	$(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, (8)
	QSRD(24,5,3,2;4,1,0)	77	1152, (76), $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3$, (76)
	QSRD(24,5,0,0;5,4,3,2,1,0)	1	$(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(24,5,0,0;5,4,3,2,1,0)	1	$(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(24,5,2,1;3,2,1,0)	1	$S_3 \times SL(2,3)$
	QSRD(24,6,4,2;4,2,0)	13	49152, $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (4), $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8)
	QSRD(24,6,3,1;3,2,1,0)	25	$\mathbb{Z}_2 \times S_4$, (9), $A_4 : \mathbb{Z}_4$, (16)
	QSRD(24,6,3,2;4,2,1,0)	201	$\mathbb{Z}_3 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2)$, (73), $\mathbb{Z}_3 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2)$, (96), $\mathbb{Z}_3 \times (\mathbb{Z}_8 : \mathbb{Z}_2)$, (16), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (16)

Tablica 4.23: Grafovi dobiveni konstrukcijom iz tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
24	QSRD(24, 6, 4, 2; 3, 2, 1, 0)	13	$D_4 \times S_3, (13),$
	QSRD(24, 6, 2, 2; 6, 2, 1, 0)	39	$((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, \mathbb{Z}_2 \times S_3 \times QD_8, (14), (14),$ $\mathbb{Z}_3 : (\mathbb{Z}_8 : \mathbb{Z}_2^2), (14), QD_8 \times S_3, (6), (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (4)$
	QSRD(24, 6, 3, 1; 3, 1)	25	$\mathbb{Z}_2 \times S_4, (9), A_4 : \mathbb{Z}_4, (16)$
	QSRD(24, 6, 4, 2; 4, 2, 1, 0)	45	$D_4 \times S_3, (17), \mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3, (8), \mathbb{Z}_8 \times S_3, (4),$ $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (4), \mathbb{Z}_2^4 : \mathbb{Z}_2, (4), (\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2, (8)$
	QSRD(24, 6, 4, 0; 4, 2, 0)	4329	49152, (2965), $\mathbb{Z}_2 \times S_4, (8), 98304, (1324)$
	QSRD(24, 6, 2, 0; 6, 4, 2, 0)	181	49152, (81), $\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2), (68), \mathbb{Z}_{12} \times S_3, (8)$
	QSRD(24, 6, 1, 0; 5, 3, 1, 0)	9	$A_4 : \mathbb{Z}_4, \mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8)$
	QSRD(24, 6, 5, 0; 5, 3, 2, 1, 0)	89	$\mathbb{Z}_4 \times S_4, \mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4), (16), (\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2, (8),$ $D_4 \times S_3, (16), (\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2, (16), \mathbb{Z}_3 \times D_{12}, (32),$ $\mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4), (17), \mathbb{Z}_4 \times S_4, (16),$ $\mathbb{Z}_6 \times D_4$
	QSRD(24, 6, 3, 0; 4, 3, 2, 0)	33	
	QSRD(24, 6, 3, 0; 5, 4, 2, 0)	25	
	QSRD(24, 6, 4, 0; 4, 3, 2, 1, 0)	61	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times S_4, (33), (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (4), \mathbb{Z}_2 \times S_4, (16),$ $\mathbb{Z}_8 \times S_3, (4), \mathbb{Z}_2^4 : \mathbb{Z}_2, (4)$
	QSRD(24, 6, 4, 0; 3, 2, 1, 0)	9	$(\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2, (9),$
	QSRD(24, 6, 5, 0; 5, 4, 2, 0)	193	$\mathbb{Z}_4 \times S_4, \mathbb{Z}_2 \times \mathbb{Z}_6 \times S_3, (96),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_4, (80), \mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (16)$
	QSRD(24, 6, 5, 0; 4, 3, 2, 1, 0)	213	$\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (49), ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2) \times S_3, (108),$ $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2, (12), \mathbb{Z}_8 \times S_3, (4), \mathbb{Z}_3 \times D_8, (4),$ $(S_3 \times S_3) : \mathbb{Z}_2, (12), (\mathbb{Z}_3 : \mathbb{Z}_4) \times S_3, (24)$
	QSRD(24, 6, 1, 0; 6, 4, 2, 1, 0)	17	$\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4, (17)$
	QSRD(24, 6, 3, 0; 5, 4, 3, 2, 1, 0)	37	$\mathbb{Z}_2 \times ((\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2),$ $\mathbb{Z}_4 \times ((S_3 \times S_3) : \mathbb{Z}_2), (36)$
	QSRD(24, 6, 4, 0; 6, 4, 3, 2, 0)	237	$\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2),$ $\mathbb{Z}_3 : (\mathbb{Z}_2^3 : \mathbb{Z}_2^2), (96), S_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8),$ $((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) \times S_3, (96), \mathbb{Z}_2^4 : \mathbb{Z}_2, (16),$ $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (8), \mathbb{Z}_8 \times S_3, (8), \mathbb{Z}_3 \times QD_8, (4)$
	QSRD(24, 6, 5, 0; 5, 4, 2, 1, 0)	233	$(\mathbb{Z}_6 \times S_3) : \mathbb{Z}_2, (25),$ $\mathbb{Z}_2 \times S_3 \times S_3, (96), \mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (16),$ $S_4 \times D_4, (64), (S_3 \times S_3) : \mathbb{Z}_2, (24),$ $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2, (8)$
	QSRD(24, 6, 4, 0; 6, 4, 2, 0)	541	$\mathbb{Z}_2 \times \mathbb{Z}_6 \times S_3, \mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8),$ 196608, (388), 49152, (80), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_4, (40),$ $(\mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4)) : \mathbb{Z}_2, (4)$
	QSRD(24, 6, 2, 0; 6, 3, 2, 0)	31	$(\mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4)) : \mathbb{Z}_2, (9), (\mathbb{Z}_4 \times S_4) : \mathbb{Z}_2, (2), (D_4 \times A_4) : \mathbb{Z}_2, (20)$
	QSRD(24, 6, 2, 0; 5, 4, 3, 2, 0)	137	$\mathbb{Z}_6 \times D_4, (9), \mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (48),$ $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2, (48), \mathbb{Z}_3 \times (\mathbb{Z}_3 : Q_8), (32)$
	QSRD(24, 6, 3, 0; 6, 4, 3, 2, 0)	67	$\mathbb{Z}_6 \times D_4, (17), \mathbb{Z}_6 \times S_4, (42)$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3, (8)$
	QSRD(24, 6, 5, 0; 5, 4, 3, 2, 0)	9	$\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (9)$
	QSRD(24, 6, 5, 0; 4, 3, 2, 0)	145	$\mathbb{Z}_3 \times D_4 \times S_3, \mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8), \mathbb{Z}_6 \times D_4, (40),$ $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (96)$
	QSRD(24, 6, 2, 0; 4, 1, 0)	69	3072
	QSRD(24, 6, 4, 0; 5, 4, 2, 1, 0)	103	$\mathbb{Z}_3 \times D_{12}, \mathbb{Z}_{12} \times S_3, (8), ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2, (50),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8), \mathbb{Z}_8 \times S_4, (12), \mathbb{Z}_8 \times A_4, (8), \mathbb{Z}_3 \times (\mathbb{Z}_8 : \mathbb{Z}_2), (16)$
	QSRD(24, 6, 4, 0; 5, 4, 2, 0)	1	$\mathbb{Z}_2 \times \mathbb{Z}_6 \times S_3$
	QSRD(24, 6, 4, 0; 5, 3, 2, 0)	1	$\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(24, 6, 3, 0; 5, 4, 2, 1, 0)	17	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_4 \times \mathbb{Z}_2), \mathbb{Z}_8 \times S_3, (4), \mathbb{Z}_3 \times D_8, (4), \mathbb{Z}_{12} \times S_3, (8)$
	QSRD(24, 6, 2, 0; 4, 2, 0)	1973	196608, (1329), 49152, (160), 98304, (476)
	QSRD(24, 6, 2, 0; 4, 2, 1, 0)	1	3072
	QSRD(24, 6, 1, 0; 4, 2, 1, 0)	113	$(\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2, \mathbb{Z}_2 \times \mathbb{Z}_4 \times (\mathbb{Z}_4^2 : \mathbb{Z}_3), (96),$ $\mathbb{Z}_4 \times ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_2), (16)$
	QSRD(24, 6, 4, 0; 5, 4, 3, 2, 0)	221	$\mathbb{Z}_6 \times D_4, (9), D_4 \times S_3, (48), \mathbb{Z}_2 \times S_4, (4), (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (96),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (48), (\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2, (8), (\mathbb{Z}_3 \times Q_8) : \mathbb{Z}_2, (8),$ $D_4 \times S_3, (\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2, (16), 13436928, (408)$
	QSRD(24, 6, 3, 0; 3, 0)	457	$\mathbb{Z}_4 \times S_4, (9), \mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4), (32)$
	QSRD(24, 6, 3, 0; 4, 3, 2, 1, 0)	41	$A_4 \times D_4$
	QSRD(24, 6, 1, 0; 5, 4, 2, 1, 0)	1	
	QSRD(24, 6, 4, 0; 4, 3, 2, 0)	117	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times S_4, (33), D_4 \times S_3, (32), \mathbb{Z}_8 \times S_3, (4),$ $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (8), \mathbb{Z}_2^4 : \mathbb{Z}_2, (4), (\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2, (16),$ $(\mathbb{Z}_3 \times Q_8) : \mathbb{Z}_2, (4)$
	QSRD(24, 6, 3, 0; 6, 3, 2, 0)	57	$\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2),$ $\mathbb{Z}_3 \times S_4 \times S_3, (52), \mathbb{Z}_3 \times S_4, (4)$
	QSRD(24, 6, 4, 0; 5, 2, 0)	1	$\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(24, 6, 1, 0; 5, 4, 3, 2, 1, 0)	17	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : \mathbb{Z}_8), \mathbb{Z}_6 \times (\mathbb{Z}_3 : \mathbb{Z}_4), (16)$
	QSRD(24, 6, 5, 0; 4, 2, 1, 0)	149	$\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (9),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4, (16), \mathbb{Z}_3 \times QD_8, (4),$ $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2), (56), 2880, (64),$ $(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2),$ $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2), (56)$
	QSRD(24, 6, 3, 0; 5, 3, 1, 0)	57	
	QSRD(24, 6, 4, 0; 4, 2, 1, 0)	189	$\mathbb{Z}_3 \times ((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2, (\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2, (72)$ $\mathbb{Z}_3 \times D_8, (8), \mathbb{Z}_3 \times QD_8, (8), \mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2), (72),$ $\mathbb{Z}_3 \times (\mathbb{Z}_4^2 : \mathbb{Z}_2), (24), (\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2, (4)$
	QSRD(24, 6, 5, 0; 4, 3, 2, 1)	1	$(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2$
	QSRD(24, 6, 3, 0; 6, 4, 3, 2, 1, 0)	5	$\mathbb{Z}_3 \times D_8, (5)$
	QSRD(24, 6, 5, 0; 5, 2, 0)	41	$(\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2, \mathbb{Z}_2 \times \mathbb{Z}_4 \times S_4, (40)$

Tablica 4.24: Grafovi dobiveni konstrukcijom iz tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
24	QSRD(24, 6, 1, 0; 5, 3, 0)	1	$A_5 : \mathbb{Z}_4$
	QSRD(24, 6, 5, 0; 3, 2, 1, 0)	1	$\mathbb{Z}_8 \times S_3$
	QSRD(24, 6, 1, 0; 4, 1, 0)	49	$((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, (37),$ $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3, (12)$
	QSRD(24, 6, 3, 0; 3, 2, 0)	25	$D_4 \times S_3, S_4 \times S_3, (24)$
	QSRD(24, 6, 5, 0; 6, 5, 4, 2, 0)	1	$\mathbb{Z}_4 \times ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_2)$
	QSRD(24, 6, 4, 0; 6, 4, 2, 1, 0)	239	$S_3 \times (\mathbb{Z}_4^2 : \mathbb{Z}_2), \mathbb{Z}_3 : ((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2), (10),$ $\mathbb{Z}_3 : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2), (54),$ $S_4 \times Q_8, (96), (96), (A_4 \times Q_8) : \mathbb{Z}_2, (20),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8), \mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2), (36),$ $\mathbb{Z}_3 \times (\mathbb{Z}_4^2 : \mathbb{Z}_2), (12)$
	QSRD(24, 6, 3, 0; 6, 3, 0)	109	13436928
	QSRD(24, 6, 3, 2; 4, 3, 2, 1, 0)	5	$\mathbb{Z}_3 \times D_8, \mathbb{Z}_3 \times QD_8, (4)$
	QSRD(24, 6, 5, 0; 5, 4, 3, 1, 0)	37	$D_4 \times S_3, (37)$
	QSRD(24, 6, 3, 0; 3, 2, 1, 0)	41	$(\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2, (9),$ $(\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2, (32)$
	QSRD(24, 6, 2, 0; 5, 3, 2, 1, 0)	9	$\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(24, 6, 1, 0; 5, 3, 2, 0)	1	$\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(24, 6, 3, 2; 3, 2, 1, 0)	9	$\mathbb{Z}_2 \times S_4$
	QSRD(24, 6, 4, 0; 3, 2, 0)	9	$(\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2, (9)$
	QSRD(24, 6, 2, 0; 5, 4, 2, 0)	29	$((\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_8 \times S_4, (12), \mathbb{Z}_{12} \times S_3, (16)$
	QSRD(24, 6, 3, 0; 5, 4, 3, 1, 0)	1	$(\mathbb{Z}_6 \times S_3) : \mathbb{Z}_2$
	QSRD(24, 6, 5, 0; 5, 2, 1, 0)	1	$S_4 \times D_4$
	QSRD(24, 6, 4, 2; 4, 0)	629	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2), 1152, (76), 294912, (552)$
	QSRD(24, 6, 5, 1; 3, 2, 0)	1	$D_4 \times S_3$
	QSRD(24, 6, 0, 0; 4, 2, 0)	505	196608 (505)
	QSRD(24, 6, 0, 0; 5, 4, 0)	33	$((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, (17),$ $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3, (8)$
	QSRD(24, 6, 0, 0; 6, 4, 0)	267	294912, 98304, (186), 49152, (80)
	QSRD(24, 6, 4, 0; 4, 1, 0)	61	$(\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2 : \mathbb{Z}_3, (41),$ $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3, (20)$
	QSRD(24, 6, 0, 1; 4, 2, 1, 0)	25	$A_4 : \mathbb{Z}_4, (\mathbb{Z}_3 \times Q_8) : \mathbb{Z}_2, (24)$
	QSRD(24, 6, 4, 1; 2, 1)	9	$D_4 \times S_3, (9)$
	QSRD(24, 6, 0, 0; 6, 4, 2, 0)	181	98304, 49152, (80), $(\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4) : \mathbb{Z}_2, (24), \mathbb{Z}_4 \times A_5, (12)$
	QSRD(24, 6, 5, 0; 3, 1, 0)	1	$\mathbb{Z}_2 \times S_5$
	QSRD(24, 6, 5, 0; 5, 3, 1, 0)	17	$\mathbb{Z}_2 \times S_4, \mathbb{Z}_3 \times D_{12}, (16)$
	QSRD(24, 6, 2, 0; 4, 3, 2, 0)	13	$\mathbb{Z}_4 \times S_4, (9), (\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2, (4)$
	QSRD(24, 6, 4, 0; 6, 2, 1, 0)	1	$S_4 \times QD_8$
	QSRD(24, 6, 0, 0; 5, 4, 2, 0)	45	$\mathbb{Z}_8 \times S_4, (A_4 \times \mathbb{Z}_8) : \mathbb{Z}_2, (36), \mathbb{Z}_{12} \times S_3, (8)$
	QSRD(24, 6, 4, 0; 6, 3, 2, 0)	37	$(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$
	QSRD(24, 6, 2, 0; 6, 4, 3, 2, 0)	101	$\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (41), Q_8 \times S_3, (24),$ $\mathbb{Z}_3 \times (\mathbb{Z}_3 \times Q_8), (16), \mathbb{Z}_3 \times D_8, (4), (\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2, (8), (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (8)$
	QSRD(24, 6, 4, 0; 6, 5, 2, 0)	1	3072
	QSRD(24, 6, 0, 0; 4, 2, 1, 0)	161	307
	QSRD(24, 6, 0, 0; 6, 0)	1	1074954240000
	QSRD(24, 6, 0, 1; 4, 2, 1)	1	$A_4 : \mathbb{Z}_4$
	QSRD(24, 6, 4, 1; 2, 1, 0)	15	$\mathbb{Z}_2 \times S_4, (15)$
	QSRD(24, 6, 2, 1; 3, 2, 1, 0)	14	$((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (14)$
	QSRD(24, 6, 4, 1; 4, 2, 1, 0)	21	$(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2, (13), \mathbb{Z}_2 \times S_4, (8),$
	QSRD(24, 6, 3, 0; 5, 3, 2, 1, 0)	1	$\mathbb{Z}_3 \times D_{12}$
	QSRD(24, 6, 1, 0; 5, 4, 3, 2, 0)	1	$\mathbb{Z}_6 \times (\mathbb{Z}_3 : \mathbb{Z}_4)$
	QSRD(24, 6, 0, 0; 5, 4, 3, 2, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_3 \times Q_8)$
	QSRD(24, 6, 5, 0; 5, 4, 3, 2, 1, 0)	41	$\mathbb{Z}_{12} \times S_3, (17), (S_3 \times S_3) : \mathbb{Z}_2, (24)$
	QSRD(24, 6, 2, 0; 5, 4, 3, 2, 1, 0)	73	$\mathbb{Z}_6 \times (\mathbb{Z}_3 : \mathbb{Z}_4), (17), (\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2), (28),$ $(S_3 \times S_3) : \mathbb{Z}_2, (24)$
	QSRD(24, 6, 5, 0; 4, 3, 1, 0)	1	$(\mathbb{Z}_6 \times S_3) : \mathbb{Z}_2$
	QSRD(24, 6, 2, 0; 6, 4, 2, 1, 0)	1	$(\mathbb{Z}_3 : \mathbb{Z}_4) \times S_3$
	QSRD(24, 6, 2, 0; 6, 4, 3, 1, 0)	1	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : Q_8$
	QSRD(24, 6, 4, 0; 6, 2, 0)	1	$S_4 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(24, 6, 2, 1; 4, 2, 1, 0)	1	$((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$
	QSRD(24, 6, 4, 0; 3, 2, 1)	1	$((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$
	QSRD(24, 6, 4, 0; 6, 3, 2, 1, 0)	17	$\mathbb{Z}_4 \times S_4, A_4 \times Q_8, (16)$
	QSRD(24, 6, 4, 2; 6, 2, 1, 0)	21	$\mathbb{Z}_3 : (\mathbb{Z}_2^3 : \mathbb{Z}_4), \mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2), (20)$
	QSRD(24, 6, 0, 0; 6, 3, 0)	109	26873856, 13436928, (108)
	QSRD(24, 6, 0, 0; 6, 4, 3, 2, 0)	21	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2 \times Q_8) : \mathbb{Z}_2), S_3 \times QD_8, (14), QD_8 \times S_3, (6)$
	QSRD(24, 6, 0, 1; 6, 2, 1)	1	$(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$
	QSRD(24, 6, 0, 1; 6, 3, 2, 1, 0)	1	$S_3 \times SL(2, 3)$
	QSRD(24, 6, 2, 1; 4, 3, 2, 1, 0)	1	$(\mathbb{Z}_3 \times Q_8) : \mathbb{Z}_2$
	QSRD(24, 6, 2, 1; 4, 2, 1)	1	$(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2$
	QSRD(24, 6, 4, 1; 3, 2, 1, 0)	3	$(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2, GL(2, 3), (2)$
	QSRD(24, 6, 2, 0; 3, 2, 0)	13	$(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$
	QSRD(24, 6, 4, 0; 5, 4, 3, 1, 0)	37	$(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$
	QSRD(24, 6, 0, 0; 6, 5, 4, 0)	21	$\mathbb{Z}_3 \times (\mathbb{Z}_4^2 : \mathbb{Z}_2), (13), (13), \mathbb{Z}_3 \times QD_8, (4), \mathbb{Z}_3 \times D_8, (4)$
	QSRD(24, 6, 2, 1; 2, 1)	7	$GL(2, 3)$
	QSRD(24, 6, 0, 0; 6, 4, 2, 1, 0)	1	$\mathbb{Z}_8 \times A_4$
	QSRD(24, 6, 0, 0; 4, 3, 2, 0)	5	$\mathbb{Z}_8 \times S_3, \mathbb{Z}_2^4 : \mathbb{Z}_2, (4)$
	QSRD(24, 6, 2, 0; 5, 4, 2, 1, 0)	25	$\mathbb{Z}_2 \times ((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_4), (25)$

Tablica 4.25: Grafovi dobiveni konstrukcijom iz tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(S) ili Aut(S)
24	QSRD(24, 6, 2, 0; 4, 3, 0)	17	$A_4 : Q_8$
	QSRD(24, 6, 4, 2; 2, 1, 0)	1	$(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2$
	QSRD(24, 6, 2, 0; 4, 3, 2, 1, 0)	33	$A_4 : Q_8, (17) \mathbb{Z}_4 \times S_4, (16)$
	QSRD(24, 6, 4, 0; 5, 4, 3, 2, 1, 0)	53	$\mathbb{Z}_8 \times S_3, \mathbb{Z}_3 \times D_8, (4) (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (48)$
	QSRD(24, 6, 0, 0; 6, 5, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_2^4 : \mathbb{Z}_2$
	QSRD(24, 6, 2, 2; 4, 3, 2, 1, 0)	13	$(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$
	QSRD(24, 6, 0, 1; 4, 3, 2, 1, 0)	1	$((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$
	QSRD(24, 6, 4, 1; 4, 3, 2, 1, 0)	1	$\mathbb{Z}_2 \times S_4$
	QSRD(24, 6, 4, 0; 4, 1)	3	$\mathbb{Z}_2 \times S_4$
	QSRD(24, 7, 5, 4; 4, 0)	1	294912
	QSRD(24, 7, 3, 2; 4, 2, 0)	1081	98304, 196608, (700), $\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3), (128),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4, (32), \mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (16),$ $\mathbb{Z}_6 \times D_4, (16), ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_4) : \mathbb{Z}_2) : \mathbb{Z}_3, (5),$ $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, (7) \mathbb{Z}_4 \times A_4, (16)$
	QSRD(24, 7, 3, 2; 4, 0)	629	196608
	QSRD(24, 7, 3, 2; 6, 4, 2, 0)	325	49152
	QSRD(24, 7, 5, 4; 2, 0)	1	49152
	QSRD(24, 7, 1, 2; 4, 2, 1, 0)	41	$(\mathbb{Z}_8 : \mathbb{Z}_2) \times S_3, \mathbb{Z}_3 : (\mathbb{Z}_2^3 : \mathbb{Z}_4), (20), \mathbb{Z}_2 \times ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_2), (20)$
	QSRD(24, 7, 4, 2; 4, 3, 2, 1, 0)	121	$\mathbb{Z}_3 : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2), (73),$ $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(24, 7, 4, 2; 3, 2, 0)	1	$D_4 \times S_3$
	QSRD(24, 7, 3, 2; 5, 4, 3, 2, 0)	9	$\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), \mathbb{Z}_6 \times D_4, (8)$
	QSRD(24, 7, 3, 2; 4, 3, 2, 1)	3	$\mathbb{Z}_2 \times S_4, (3)$
	QSRD(24, 7, 4, 2; 3, 2, 1)	1	$D_4 \times S_3$
	QSRD(24, 7, 4, 3; 2, 1)	9	$\mathbb{Z}_2 \times S_4$
	QSRD(24, 7, 4, 1; 3, 2, 1)	9	$\mathbb{Z}_2 \times S_4$
	QSRD(24, 7, 2, 2; 6, 4, 3, 2, 1, 0)	33	$(\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_4, (25), \mathbb{Z}_3 \times D_8, (4),$ $\mathbb{Z}_3 \times QD_8, (4)$
	QSRD(24, 7, 5, 0; 5, 4, 2, 1, 0)	65	$((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, (23),$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (24),$ $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2, (12),$ $((((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2, (6)$
	QSRD(24, 7, 3, 0; 6, 4, 2, 0)	637	$\mathbb{Z}_2 \times (((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, 82944, (636)$
	QSRD(24, 7, 5, 0; 4, 2, 0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2)$
	QSRD(24, 7, 5, 0; 5, 4, 3, 0)	159	$((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (23),$ $\mathbb{Z}_2 \times S_4, (6), D_4 \times S_3, (8), (\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2), (56),$ $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2, (12),$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (24),$ $((((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2, (6),$ $\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4, (8), \mathbb{Z}_3 \times D_{12}, (16)$
	QSRD(24, 7, 5, 0; 6, 4, 3, 0)	17	$((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, A_4 : \mathbb{Z}_4, (8),$ $\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4, (8)$
	QSRD(24, 7, 5, 0; 6, 4, 2, 0)	265	$\mathbb{Z}_2 \times (((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (117),$ $((\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, (48),$ $((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2) \times S_3, (76),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8), S_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (4),$ $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8),$ $\mathbb{Z}_2 \times (((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3), (4),$
	QSRD(24, 7, 2, 0; 7, 5, 4, 3, 0)	73	$\mathbb{Z}_4 \times S_4, (\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (64),$ $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2, (8)$
	QSRD(24, 7, 3, 0; 6, 5, 4, 3, 0)	1	$\mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4)$
	QSRD(24, 7, 3, 0; 7, 4, 3, 0)	1	$\mathbb{Z}_6 \times S_4$
	QSRD(24, 7, 4, 0; 5, 4, 3, 0)	135	$(\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)) : \mathbb{Z}_2, (17), 10368, (66), D_4 \times S_3, (8),$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (24),$ $\mathbb{Z}_4 \times A_4, (8), (24), (((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (6),$ $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (6)$
	QSRD(24, 7, 6, 0; 7, 4, 2, 0)	257	1536
	QSRD(24, 7, 4, 0; 6, 5, 4, 2, 0)	377	$\mathbb{Z}_6 \times D_4, (17), (\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (60),$ $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3, (72),$ $((((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (56),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (24),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4, (32), ((\mathbb{Z}_4 \times \mathbb{Z}_2^5) : \mathbb{Z}_2) : \mathbb{Z}_3, (48),$ $\mathbb{Z}_8 \times S_3, (8), (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (4),$ $((\mathbb{Z}_2 \times ((\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3, (40), \mathbb{Z}_8 \times A_4, (16)$
	QSRD(24, 7, 5, 0; 4, 0)	9	$\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2, D_4 \times S_3, (4) \mathbb{Z}_2 \times S_4$
	QSRD(24, 7, 5, 0; 6, 5, 4, 3, 2, 0)	97	$\mathbb{Z}_6 \times D_4, (9), \mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (24),$ $D_4 \times S_3, (12), \mathbb{Z}_{12} \times S_3, (8),$ $\mathbb{Z}_4 \times ((S_3 \times S_3) : \mathbb{Z}_2), (36), \mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3, (8)$
	QSRD(24, 7, 6, 0; 6, 5, 4, 2, 1, 0)	73	$\mathbb{Z}_3 : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2), (73)$
	QSRD(24, 7, 6, 0; 7, 5, 3, 2, 0)	1	$(\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)) : \mathbb{Z}_2$
	QSRD(24, 7, 1, 2; 4, 1)	1	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times Q_8) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(24, 7, 5, 2; 4, 3, 2, 0)	5	$\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3, (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (4)$
	QSRD(24, 7, 4, 0; 6, 5, 3, 2, 0)	1	10368
	QSRD(24, 7, 6, 0; 6, 5, 4, 3, 2, 0)	125	$(\mathbb{Z}_6 \times S_3) : \mathbb{Z}_2, \mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (24), \mathbb{Z}_2 \times S_3 \times S_3, (48),$ $(S_3 \times S_3) : \mathbb{Z}_2, (24), \mathbb{Z}_8 \times S_3, (4),$ $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (24)$

Tablica 4.26: Grafovi dobiveni konstrukcijom iz tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
24	QSRD(24, 7, 6, 0; 7, 6, 2, 0)	329	1296, 9216, (288), $\mathbb{Z}_3 \times ((\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (40)
	QSRD(24, 7, 6, 0; 7, 6, 4, 2, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : D_4)$
	QSRD(24, 7, 6, 0; 7, 6, 3, 2, 0)	1	1296
	QSRD(24, 7, 6, 0; 6, 5, 4, 2, 0)	81	$\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (17), $\mathbb{Z}_2 \times \mathbb{Z}_6 \times S_3$, (48), $\mathbb{Z}_6 \times D_4$, (8), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8)
	QSRD(24, 7, 4, 0; 7, 6, 4, 2, 0)	9	$\mathbb{Z}_6 \times D_4$, $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8)
	QSRD(24, 7, 3, 2; 4, 3, 2, 0)	9	$\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(24, 7, 3, 0; 4, 3, 2, 0)	1	82944
	QSRD(24, 7, 5, 0; 7, 5, 4, 2, 0)	9	$\mathbb{Z}_3 \times D_4 \times S_3$, $\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8)
	QSRD(24, 7, 6, 0; 7, 4, 3, 0)	53	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$, (25), $(\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)) : \mathbb{Z}_2$, (16), $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$, (4) $((((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2$, (8) $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$, $\mathbb{Z}_4 \times A_4$, (8)
	QSRD(24, 7, 4, 0; 6, 5, 4, 3, 0)	9	$(\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2$
	QSRD(24, 7, 6, 0; 4, 3, 0)	1	$\mathbb{Z}_4 \times S_4$, $D_4 \times S_3$, (8), $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$, (8)
	QSRD(24, 7, 2, 0; 7, 6, 5, 3, 2, 0)	17	$A_4 : \mathbb{Z}_8$, $\mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4)$, (16)
	QSRD(24, 7, 2, 0; 7, 6, 2, 0)	73	$\mathbb{Z}_8 \times S_4$, 2880, (64), $\mathbb{Z}_{12} \times S_3$, (8)
	QSRD(24, 7, 4, 0; 7, 6, 4, 3, 0)	41	$\mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4)$, (17), $A_4 : \mathbb{Z}_4$, (8), $A_4 : \mathbb{Z}_8$, (16)
	QSRD(24, 7, 6, 0; 7, 6, 4, 3, 2, 0)	1	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(24, 7, 5, 2; 4, 2, 0)	1	$A_4 : \mathbb{Z}_4$
	QSRD(24, 7, 3, 0; 6, 5, 4, 3, 2, 0)	37	$\mathbb{Z}_6 \times (\mathbb{Z}_3^3 : \mathbb{Z}_4)$, $(S_3 \times S_3) : \mathbb{Z}_2$, (12), $\mathbb{Z}_2 \times ((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_4)$, (24)
	QSRD(24, 7, 5, 0; 7, 5, 4, 3, 2, 0)	9	$\mathbb{Z}_3 \times D_{12}$, $\mathbb{Z}_{12} \times S_3$, (8)
	QSRD(24, 7, 2, 0; 6, 5, 4, 2, 0)	9	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : Q_8)$, $\mathbb{Z}_{12} \times S_3$, (8)
	QSRD(24, 7, 5, 0; 6, 5, 4, 2, 0)	9	$\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8)
	QSRD(24, 7, 5, 0; 5, 4, 2, 0)	1	$\mathbb{Z}_2 \times S_4$
	QSRD(24, 7, 4, 0; 6, 5, 4, 3, 2, 0)	9	$\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8)
	QSRD(24, 7, 6, 0; 6, 5, 4, 3, 2, 1, 0)	1	$(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$
	QSRD(24, 7, 2, 0; 6, 5, 4, 3, 2, 0)	1	$\mathbb{Z}_8 \times S_3$
	QSRD(24, 7, 2, 0; 6, 5, 4, 3, 0)	21	$\mathbb{Z}_8 \times S_3$, $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$, (12), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8)
	QSRD(24, 7, 6, 0; 5, 4, 3, 2, 0)	33	$\mathbb{Z}_8 \times S_3$, $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (24), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (8)
	QSRD(24, 7, 2, 2; 6, 3, 1, 0)	1	$(\mathbb{Z}_3 : Q_8) : \mathbb{Z}_2$
	QSRD(24, 7, 2, 2; 4, 3, 2, 1, 0)	1	$\mathbb{Z}_3 \times D_8$
	QSRD(24, 7, 6, 0; 5, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_8 \times S_3$
	QSRD(24, 7, 2, 2; 6, 3, 2, 1, 0)	1	$(\mathbb{Z}_3 : Q_8) : \mathbb{Z}_2$
	QSRD(24, 7, 0, 2; 4, 3, 2, 1, 0)	1	$\mathbb{Z}_3 \times QD_8$
	QSRD(24, 7, 4, 2; 5, 4, 3, 2, 0)	5	$\mathbb{Z}_8 \times S_3$, $\mathbb{Z}_2^4 : \mathbb{Z}_2$, (4)
	QSRD(24, 7, 2, 0; 7, 6, 5, 4, 3, 2, 0)	1	$(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(24, 7, 6, 0; 5, 4, 2, 1, 0)	1	$\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2)$
	QSRD(24, 8, 5, 4; 6, 3, 0)	433	13436928
	QSRD(24, 8, 5, 4; 3, 0)	1	13436928
	QSRD(24, 8, 2, 2; 4, 2)	745	49152
	QSRD(24, 8, 4, 2; 4, 2)	837	49152, 98304, (804), $\mathbb{Z}_2 \times S_4$, (4), $(A_4 : \mathbb{Z}_4) : \mathbb{Z}_2$, (12), $(\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2$, (12), $GL(2, 3)$, (4)
	QSRD(24, 8, 2, 2; 6, 4, 3, 2, 0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)$
	QSRD(24, 8, 1, 2; 6, 4, 3, 2, 1)	33	$\mathbb{Z}_2 \times (\mathbb{Z}_4^2 : \mathbb{Z}_3)$, (33)
	QSRD(24, 9, 5, 4; 4, 2)	847	98304, (403), 49152, (444)
	QSRD(24, 9, 6, 2; 6, 5, 4, 3, 2)	73	$\mathbb{Z}_3 : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2)$, (73)
	QSRD(24, 9, 6, 2; 6, 4, 3)	25	$D_4 \times S_3$, $S_4 \times S_3$, (24)
	QSRD(24, 9, 4, 3; 6, 5, 4, 3)	9	$\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (9)
	QSRD(24, 9, 5, 3; 5, 4, 3)	185	$\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (41), $(\mathbb{Z}_6 \times S_3) : \mathbb{Z}_2$, (48), $(S_3 \times S_3) : \mathbb{Z}_2$, (96)
	QSRD(24, 7, 6, 0; 6, 4, 3, 2, 0)	147	$\mathbb{Z}_6 \times D_4$, $D_4 \times S_3$, (8), $\mathbb{Z}_8 \times S_4$, (12), $\mathbb{Z}_8 \times A_4$, (8), $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (24), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (16), $\mathbb{Z}_6 \times S_4$, (14), $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$, (24), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4$, (16), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_4$, (24)
	QSRD(24, 7, 4, 0; 7, 5, 4, 2, 0)	17	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2)$, $\mathbb{Z}_8 \times S_3$, (4), $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3$, (8) $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2$, (4)
	QSRD(24, 7, 2, 0; 4, 3, 2, 0)	17	3072, $(\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_8$, (16)
	QSRD(24, 7, 3, 2; 4, 3, 1, 0)	33	$((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, (9), $(\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3$, (12), $(\mathbb{Z}_2^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3$, (12)
	QSRD(24, 7, 4, 0; 5, 4, 2, 0)	1	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(24, 7, 4, 0; 5, 4, 2, 1, 0)	53	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$, (25), $(\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)) : \mathbb{Z}_2$, (16), $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$, (4), $((((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2$, (8)
	QSRD(24, 7, 2, 0; 6, 4, 3, 2, 0)	465	$((\mathbb{Z}_4 \times \mathbb{Z}_2^5) : \mathbb{Z}_2) : \mathbb{Z}_3$, 3072, (432) $\mathbb{Z}_8 \times (\mathbb{Z}_4^2 : \mathbb{Z}_3)$, (32)
	QSRD(24, 7, 5, 0; 6, 5, 4, 3, 0)	5	$D_4 \times S_3$, (5)

Tablica 4.27: Grafovi dobiveni konstrukcijom iz tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
24	QSRD(24, 7, 6, 0; 6, 5, 4, 3, 0)	33	$\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2),$ $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (24), \mathbb{Z}_2 \times S_4$
	QSRD(24, 7, 6, 0; 6, 4, 2, 1, 0)	65	$\mathbb{Z}_3 \times (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2), (5),$ $\mathbb{Z}_3 \times (\mathbb{Z}_4^2 : \mathbb{Z}_2), (24), (24), \mathbb{Z}_3 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2), (24),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2), (12)$
	QSRD(24, 7, 3, 2; 4, 2, 1, 0)	25	$\mathbb{Z}_3 \times (\mathbb{Z}_8 : \mathbb{Z}_2), (9), \mathbb{Z}_3 \times QD_8, (8), \mathbb{Z}_3 \times D_8, (8),$
	QSRD(24, 7, 6, 0; 7, 6, 3, 0)	17	3072, $(\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_8, (16)$
	QSRD(24, 7, 2, 0; 7, 4, 0)	1	$A_5 : Q_8$
	QSRD(24, 7, 4, 0; 6, 4, 3, 2, 0)	147	$\mathbb{Z}_6 \times S_4, 3456, (66), \mathbb{Z}_3 \times (((\mathbb{Z}_2^3 : \mathbb{Z}_2^2) : \mathbb{Z}_2) : \mathbb{Z}_2), (21),$ $\mathbb{Z}_3 \times (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2), (5),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (16)$ $\mathbb{Z}_3 \times (((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2) : \mathbb{Z}_2), (18)$ $\mathbb{Z}_3 \times (\mathbb{Z}_4^2 : \mathbb{Z}_2), (12), \mathbb{Z}_6 \times D_4, (8)$ $(\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2$ $(\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)) : \mathbb{Z}_2$
	QSRD(24, 7, 3, 0; 6, 4, 0)	1	$\mathbb{Z}_6 \times D_4$
	QSRD(24, 7, 6, 0; 7, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_3 \times (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2), (21), 3456, (174),$
	QSRD(24, 7, 3, 0; 6, 5, 4, 2, 0)	1	$\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2), (36)$
	QSRD(24, 7, 4, 0; 4, 3, 2, 0)	211	$\mathbb{Z}_8 \times S_3$
	QSRD(24, 7, 5, 0; 6, 5, 3, 2, 1, 0)	1	$\mathbb{Z}_3 \times D_8$
	QSRD(24, 7, 5, 0; 7, 5, 4, 2, 1, 0)	1	$(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2$
	QSRD(24, 7, 4, 0; 5, 4, 0)	9	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2, (8)$
	QSRD(24, 7, 6, 0; 6, 4, 3, 2, 1, 0)	145	$D_4 \times S_3, \mathbb{Z}_3 : (\mathbb{Z}_2^4 : \mathbb{Z}_2), (72), \mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2), (72),$
	QSRD(24, 7, 3, 0; 5, 4, 3, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : D_4)$
	QSRD(24, 7, 3, 0; 7, 5, 4, 3, 2, 0)	17	$\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), \mathbb{Z}_6 \times (\mathbb{Z}_3 : \mathbb{Z}_4), (16)$
	QSRD(24, 7, 2, 0; 7, 5, 4, 2, 0)	1	$\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2)$
	QSRD(24, 7, 6, 0; 5, 4, 3, 2, 1)	1	$D_4 \times S_3$
	QSRD(24, 7, 1, 2; 6, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_4 \times A_4$
	QSRD(24, 7, 5, 2; 4, 3, 2, 1, 0)	9	$\mathbb{Z}_4 \times A_4, D_4 \times S_3, (8)$
	QSRD(24, 7, 2, 2; 6, 4, 3, 2, 0)	9	$\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (9)$
	QSRD(24, 7, 4, 2; 4, 3, 2, 0)	9	$\mathbb{Z}_6 \times D_4, (9)$
	QSRD(24, 7, 6, 0; 7, 6, 2, 1, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : D_4)$
	QSRD(24, 7, 0, 0; 7, 6, 0)	61	120960, 1152, (48), $\mathbb{Z}_3 \times (\mathbb{Z}_4^2 : \mathbb{Z}_2), (12)$
	QSRD(24, 7, 4, 0; 7, 4, 3, 0)	25	$((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) \times S_3, \mathbb{Z}_8 \times S_3, (4) (\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2, (12),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8)$
	QSRD(24, 7, 4, 0; 7, 5, 4, 3, 0)	25	$(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2, Q_8 \times S_3, (24)$
	QSRD(24, 7, 6, 0; 5, 4, 2, 0)	5	$\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3, (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (4)$
	QSRD(24, 7, 1, 2; 6, 4, 2, 0)	1	$A_4 : \mathbb{Z}_4$
	QSRD(24, 7, 2, 0; 7, 6, 4, 2, 0)	113	$\mathbb{Z}_8 \times S_4, \mathbb{Z}_3 \times (\mathbb{Z}_3 : Q_8), (16),$ $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2 \times Q_8) : \mathbb{Z}_2), (72)$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_4, (24)$
	QSRD(24, 9, 4, 3; 5, 4, 3)	49	$(\mathbb{Z}_6 \times S_3) : \mathbb{Z}_2, (25), (S_3 \times S_3) : \mathbb{Z}_2, (24)$
	QSRD(24, 9, 4, 3; 5, 3)	41	$\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (41)$
	QSRD(24, 9, 6, 3; 5, 4, 3)	101	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2), (45),$ $D_4 \times S_3, (8), (\mathbb{Z}_6 \times S_3) : \mathbb{Z}_2, (48)$
	QSRD(24, 9, 6, 4; 6, 3, 2)	49	$D_4 \times S_3, (25), S_4 \times S_3, (24)$
	QSRD(24, 9, 6, 3; 6, 3)	417	$D_4 \times S_3, (9), 13436928, (408)$
	QSRD(24, 9, 6, 2; 5, 4, 3)	13	$D_4 \times S_3, (13)$
	QSRD(24, 9, 6, 3; 7, 3, 2)	1	$D_4 \times S_3$
	QSRD(24, 9, 6, 3; 8, 3, 1)	1	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(24, 9, 5, 4; 5, 3, 2)	73	$(\mathbb{Z}_3 \times \mathbb{Z}_3 \times \mathbb{Z}_3 \times \mathbb{Z}_3) : D_4, (73)$
	QSRD(24, 9, 5, 3; 4, 3)	37	$(S_3 \times S_3) : \mathbb{Z}_2, (37)$
	QSRD(24, 9, 7, 0; 8, 6, 0)	273	$\mathbb{Z}_2 \times (((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3,$ 2304, (272)
	QSRD(24, 9, 7, 0; 8, 7, 6, 0)	47	$((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, A_4 : \mathbb{Z}_4, (8),$ $\mathbb{Z}_2 \times S_4, (2), D_4 \times S_3, (12), \mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4, (8),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3, (8),$ $\mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8)$
	QSRD(24, 9, 7, 0; 9, 8, 7, 6, 0)	1	$\mathbb{Z}_6 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(24, 9, 6, 0; 9, 8, 7, 6, 0)	173	$A_4 : \mathbb{Z}_4, (\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times D_4) : \mathbb{Z}_2), (52),$ $(\mathbb{Z}_3 \times \mathbb{Z}_3) : (((\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2), (54),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3, (8), \mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4), (32),$ $\mathbb{Z}_8 \times S_3, (4), (\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4^2 : \mathbb{Z}_2) : \mathbb{Z}_2), (2),$ $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (4)$
	QSRD(24, 9, 8, 0; 9, 7, 6, 0)	53	2304, $(\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)) : \mathbb{Z}_2, (16),$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (24),$ $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3 : \mathbb{Z}_2, (6),$ $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (6)$
	QSRD(24, 9, 6, 0; 8, 7, 6, 0)	413	$\mathbb{Z}_6 \times D_4, (\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)) : \mathbb{Z}_2, (16),$ 2304, (200), $((\mathbb{Z}_4 \times \mathbb{Z}_2^5) : \mathbb{Z}_2) : \mathbb{Z}_3, (24),$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (24),$ $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3 : \mathbb{Z}_2, (28)$ $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, (36),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times A_4, (32), \mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8),$ $\mathbb{Z}_8 \times A_4, (16), ((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (10),$ $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3 : \mathbb{Z}_2, (2)$

Tablica 4.28: Grafovi dobiveni konstrukcijom iz tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
24	QSRD(24, 9, 6, 0; 9, 8, 6, 0)	9	$\mathbb{Z}_6 \times S_4, \mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8)$
	QSRD(24, 9, 8, 0; 8, 7, 6, 0)	325	$\mathbb{Z}_6 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (65), \mathbb{Z}_6 \times D_4, (8),$ $\mathbb{Z}_2 \times ((S_3 \times S_3) : \mathbb{Z}_2), (96), \mathbb{Z}_2 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (24),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2), (80),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times S_3, (8), \mathbb{Z}_2 \times S_4, (8),$ $(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (28),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (8)$
	QSRD(24, 9, 6, 0; 9, 6, 0)	109	26873856, 13436928, (108)
	QSRD(24, 9, 8, 0; 7, 6, 0)	9	$D_4 \times S_3, (\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2, (8)$
	QSRD(24, 9, 5, 2; 5, 3)	5	$GL(2, 3), (5)$
	QSRD(24, 9, 6, 4; 6, 4, 2, 1, 0)	33	$\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (25), \mathbb{Z}_3 \times QD_8, (8),$
	QSRD(24, 9, 6, 4; 6, 4, 3, 2, 0)	37	$\mathbb{Z}_6 \times D_4, (9), \mathbb{Z}_6 \times S_4, (28)$
	QSRD(24, 9, 8, 0; 9, 8, 6, 0)	25	6144, $\mathbb{Z}_8 \times ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_2), (24)$
	QSRD(24, 9, 3, 3; 3, 6, 5, 3)	9	$\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (9)$
	QSRD(24, 9, 6, 0; 9, 7, 6, 0)	27	$(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2, Q_8 \times S_3, (24) \mathbb{Z}_3 \times S_4, (2)$
	QSRD(24, 9, 8, 0; 9, 8, 7, 6, 0)	1	$\mathbb{Z}_3 \times ((\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(24, 9, 6, 0; 7, 6, 0)	1	$\mathbb{Z}_4 \times A_4$
	QSRD(24, 9, 7, 0; 7, 6, 0)	3	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4, \mathbb{Z}_2 \times S_4, (2)$
	QSRD(24, 9, 6, 3; 8, 3, 2, 1)	1	$\mathbb{Z}_3 \times D_{12}$
	QSRD(24, 9, 0, 3; 8, 7, 3, 2)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : Q_8)$
	QSRD(24, 9, 8, 3; 8, 6, 3, 2, 1)	17	$\mathbb{Z}_3 \times D_{12}, (17)$
	QSRD(24, 9, 2, 3; 8, 7, 3, 2, 0)	17	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : Q_8), (17)$
	QSRD(24, 9, 8, 3; 7, 3, 1)	1	$(\mathbb{Z}_6 \times S_3) : \mathbb{Z}_2$
	QSRD(24, 9, 2, 3; 9, 7, 3, 1)	1	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : Q_8$
	QSRD(24, 9, 0, 3; 9, 7, 3, 2)	1	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2 \times Q_8) : \mathbb{Z}_2)$
	QSRD(24, 9, 8, 3; 8, 6, 3, 1)	1	$\mathbb{Z}_3 \times D_{12}$
	QSRD(24, 9, 2, 3; 9, 7, 3, 2, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : Q_8)$
	QSRD(24, 9, 0, 3; 9, 5, 4, 3)	1	$Q_8 \times S_3$
	QSRD(24, 9, 0, 3; 9, 3, 0)	1	40310784
	QSRD(24, 9, 0, 3; 9, 6, 3)	1	$S_3 \times SL(2, 3)$
	QSRD(24, 9, 6, 3; 9, 6, 3, 0)	1	$\mathbb{Z}_3 \times SL(2, 3)$
	QSRD(24, 9, 6, 4; 6, 4, 3, 2, 1, 0)	5	$\mathbb{Z}_3 \times D_8, (5)$
	QSRD(24, 9, 6, 4; 6, 4, 3, 1, 0)	1	$\mathbb{Z}_3 \times SL(2, 3)$
	QSRD(24, 9, 6, 3; 6, 5, 4, 3, 2)	1	$A_4 \times S_3$
	QSRD(24, 10, 6, 4; 5, 4)	65	$(\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2, (\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2, (64)$
	QSRD(24, 10, 5, 4; 5, 4)	421	$D_{12}, (\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2, (24), (\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2, (48), (\mathbb{Z}_6 \times S_3) : \mathbb{Z}_2, (192),$ $S_4, (48), (S_3 \times S_3) : \mathbb{Z}_2, (48), A_5 : \mathbb{Z}_4, (12),$ $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2, (16)$
	QSRD(24, 10, 6, 4; 8, 6, 2)	1	98304
	QSRD(24, 10, 6, 4; 8, 6, 4, 0)	559	1572864, (439), $\mathbb{Z}_4 \times S_4, (120)$
	QSRD(24, 10, 2, 4; 8, 6, 4, 2)	53	$\mathbb{Z}_2 \times A_4, \mathbb{Z}_3 : (\mathbb{Z}_2^3 : \mathbb{Z}_4), (52)$
	QSRD(24, 10, 6, 4; 6, 4)	2785	1572864, 49152, (504), 98304, (848), $\mathbb{Z}_2 \times S_4, (52), D_{12}, (144),$ $\mathbb{Z}_2 \times \mathbb{Z}_2 \times S_4, (176), \mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4, (128),$ $(A_4 : \mathbb{Z}_4) : \mathbb{Z}_2, (180), (\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2, (72),$ $\mathbb{Z}_2 \times A_4, (192), \mathbb{Z}_4 \times S_3, (72),$ $\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2), (324),$ $\mathbb{Z}_2 \times (((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4) : \mathbb{Z}_2), (36)$ $\mathbb{Z}_3 : (\mathbb{Z}_2^3 : \mathbb{Z}_2^2)$
	QSRD(24, 10, 8, 4; 8, 6, 4, 2)	1	$\mathbb{Z}_3 : \mathbb{Z}_8, (\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2, (24), \mathbb{Z}_2 \times (\mathbb{Z}_3 : \mathbb{Z}_4), (48)$
	QSRD(24, 10, 2, 4; 8, 4, 2)	1	98304
	QSRD(24, 10, 6, 4; 6, 4, 2)	193	$S_4, (25), (\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2, (48), \mathbb{Z}_2 \times A_4, (120)$
	QSRD(24, 10, 5, 4; 6, 5, 4)	113	$\mathbb{Z}_4 \times S_3, (49), \mathbb{Z}_4 \times S_4, (64)$
	QSRD(24, 10, 2, 4; 10, 8, 4, 0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4)$
	QSRD(24, 10, 2, 4; 6, 4, 2)	1	$\mathbb{Z}_2 \times A_4$
	QSRD(24, 10, 6, 4; 8, 6, 4, 2)	1	$\mathbb{Z}_2 \times A_4$
	QSRD(24, 10, 5, 3; 6, 5, 3)	25	$S_4, (25)$
	QSRD(24, 10, 6, 4; 6, 5, 4, 3)	73	$S_4, (73)$
	QSRD(24, 10, 6, 4; 5, 4, 3)	25	$S_4, (25)$
	QSRD(24, 10, 7, 3; 5, 4)	201	$D_4 \times S_3, (\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2), (168), \mathbb{Z}_3 \times D_4, (32)$
	QSRD(24, 10, 7, 3; 7, 5, 2)	1	$D_4 \times S_3$
	QSRD(24, 10, 7, 3; 6, 5, 3)	369	$D_4 \times S_3, (57), \mathbb{Z}_3 \times D_4, (32), 10368, (280)$
	QSRD(24, 10, 9, 4; 9, 4, 2, 0)	1	$\mathbb{Z}_4 \times (\mathbb{Z}_4^2 : \mathbb{Z}_3)$
	QSRD(24, 10, 5, 4; 7, 6, 5, 4, 3, 2, 0)	41	$\mathbb{Z}_2^4, (9), \mathbb{Z}_{12} \times \mathbb{Z}_2, (32)$
	QSRD(24, 10, 6, 3; 7, 6, 5, 3)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : D_4)$
	QSRD(24, 10, 7, 3; 7, 6, 5, 3, 2)	17	$\mathbb{Z}_3 \times D_4, (17)$
	QSRD(24, 10, 7, 3; 8, 5, 4, 1)	17	$\mathbb{Z}_3 \times D_4, (17)$
	QSRD(24, 10, 1, 4; 10, 8, 4, 1)	1	$\mathbb{Z}_4 \times (\mathbb{Z}_4^2 : \mathbb{Z}_3)$
	QSRD(24, 10, 2, 4; 8, 5, 4)	1	$A_4 : \mathbb{Z}_4$
	QSRD(24, 10, 2, 4; 10, 4)	129	$A_4 : Q_8, (61), (\mathbb{Z}_2 : ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_2)) = (((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4) : \mathbb{Z}_3) : \mathbb{Z}_2 : \mathbb{Z}_2, (68)$
	QSRD(24, 10, 8, 4; 6, 5, 4, 2)	25	$(\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2, (25)$
	QSRD(24, 10, 7, 3; 8, 5, 1)	1	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(24, 10, 5, 4; 8, 5, 4, 2)	9	$\mathbb{Z}_4 \times A_4$
	QSRD(24, 10, 1, 4; 9, 6, 4)	9	$\mathbb{Z}_4 \times A_4$
	QSRD(24, 10, 9, 4; 6, 4, 1)	9	$\mathbb{Z}_4 \times A_4$
	QSRD(24, 10, 5, 4; 10, 5, 4, 0)	13	$\mathbb{Z}_4 \times A_4, \mathbb{Z}_4 \times A_5, (12)$
	QSRD(24, 10, 8, 0; 10, 8, 0)	367	147456, 393216, (282), 49152, (84)

Tablica 4.29: Grafovi dobiveni konstrukcijom iz tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
24	QSRD(24, 10, 9, 0; 9, 8, 0)	513	$(\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2, (25),$ $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (96),$ $\mathbb{Z}_2 \times A_4, (24), (((\mathbb{Z}_2 \times (\mathbb{Z}_4 \times \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (8),$ $S_4, (24), \mathbb{Z}_2 \times ((S_3 \times S_3) : \mathbb{Z}_2), (192), \mathbb{Z}_4 \times S_3, (48),$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (16)$
	QSRD(24, 10, 8, 0; 10, 9, 8, 0)	859	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2),$ $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4 \times D_4) : \mathbb{Z}_2) : \mathbb{Z}_2, (92),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2), (224),$ $(\mathbb{Z}_3 \times \mathbb{Z}_3) : (((\mathbb{Z}_4 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2, (94),$ $\mathbb{Z}_{12} \times \mathbb{Z}_2, (64), \mathbb{Z}_3 \times D_8, (16),$ $\mathbb{Z}_2^4 : \mathbb{Z}_2, (52), (\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (36), \mathbb{Z}_3 \times QD_8, (28),$ $\mathbb{Z}_8 \times S_3, (20), (\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_4^2 : \mathbb{Z}_2) : \mathbb{Z}_2), (2)$
	QSRD(24, 10, 7, 3; 9, 6, 5, 3, 0)	1	$\mathbb{Z}_3 \times SL(2, 3)$
	QSRD(24, 10, 9, 0; 10, 9, 8, 0)	421	3888, $\mathbb{Z}_6 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (296),$ $\mathbb{Z}_2 \times \mathbb{Z}_4 \times ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_2), (108)$
	QSRD(24, 10, 8, 0; 9, 8, 0)	333	$\mathbb{Z}_2 \times S_4, ((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, (32),$ $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_3, (16),$ $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2, (20), \mathbb{Z}_3 \times Q_8, (48),$ $(\mathbb{Z}_3 \times Q_8) : \mathbb{Z}_2, (40), \mathbb{Z}_4 \times S_3, (24),$ $\mathbb{Z}_2 \times (\mathbb{Z}_3 : \mathbb{Z}_4), (48), \mathbb{Z}_3 : Q_8, (48)$
	QSRD(24, 10, 7, 3; 7, 5, 4, 2)	1	$\mathbb{Z}_3 \times Q_8$
	QSRD(24, 10, 6, 4; 8, 6, 4, 2, 0)	117	49152, (85), $\mathbb{Z}_{12} \times \mathbb{Z}_2, (32)$
	QSRD(24, 10, 2, 4; 9, 4, 0)	1	$((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4) : \mathbb{Z}_3 : \mathbb{Z}_4$
	QSRD(24, 10, 7, 4; 7, 6, 5, 4, 3, 2, 0)	1	$\mathbb{Z}_4 \times S_3$
	QSRD(24, 10, 1, 4; 9, 4, 1)	1	$((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4) : \mathbb{Z}_2 : \mathbb{Z}_3$
	QSRD(24, 10, 9, 4; 9, 4, 1)	1	$((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4) : \mathbb{Z}_2 : \mathbb{Z}_3$
	QSRD(24, 10, 0, 4; 9, 4, 2)	1	$\mathbb{Z}_2 \cdot ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_4) = ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times Q_8) : \mathbb{Z}_3) : \mathbb{Z}_4$
	QSRD(24, 10, 8, 4; 10, 4, 1)	1	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times Q_8) : \mathbb{Z}_3) : \mathbb{Z}_2 : \mathbb{Z}_2$
	QSRD(24, 10, 4, 4; 8, 4)	121	$\mathbb{Z}_3 : \mathbb{Z}_8, (73), SL(2, 3), (48)$
	QSRD(24, 10, 4, 4; 8, 6, 4, 2, 0)	17	$\mathbb{Z}_{12} \times \mathbb{Z}_2, (17)$
	QSRD(24, 10, 4, 4; 6, 5, 4)	29	$A_4 : Q_8, GL(2, 3), (28)$
	QSRD(24, 10, 4, 4; 6, 4)	1	$\mathbb{Z}_2 \times (A_4 : \mathbb{Z}_4)$
	QSRD(24, 10, 0, 4; 10, 8, 4, 2)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_4)$
	QSRD(24, 10, 8, 4; 10, 4, 2, 0)	1	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_2)$
	QSRD(24, 10, 8, 4; 6, 4, 0)	1	$((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4) : \mathbb{Z}_3 : \mathbb{Z}_2$
	QSRD(24, 10, 0, 4; 10, 5, 4)	1	$SL(2, 5)$
	QSRD(24, 10, 0, 4; 8, 6, 4)	8	$\mathbb{Z}_2 \cdot ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_2) = ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4) : \mathbb{Z}_3 \cdot \mathbb{Z}_2, (8)$
	QSRD(24, 11, 7, 6; 8, 4, 0)	560	1146617856, (560)
	QSRD(24, 11, 7, 6; 8, 2)	488	98304, (476), $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3, (7),$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_4) : \mathbb{Z}_2) : \mathbb{Z}_3, (5)$
	QSRD(24, 11, 7, 6; 8, 4, 2, 0)	204	49152, (160), $\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (16), \mathbb{Z}_6 \times S_4, (28)$
	QSRD(24, 11, 7, 4; 6, 4)	1636	3072, (1104), $\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2), (224),$ $\mathbb{Z}_2 \times S_4, (4), \mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4, (32),$ $\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2), (240)$
	QSRD(24, 11, 6, 4; 7, 6, 4)	752	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (192), 3072, (560),$ $3072, (168)$
	QSRD(24, 11, 7, 4; 6, 5)	168	$\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : D_4), (128)$
	QSRD(24, 11, 7, 3; 8, 7, 3)	128	$\mathbb{Z}_3 \times (\mathbb{Z}_3^3 : D_4), (128)$
	QSRD(24, 11, 8, 3; 7, 3)	264	10368, (264)
	QSRD(24, 11, 6, 5; 7, 5, 3)	16	$\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2), (16)$
	QSRD(24, 11, 10, 5; 5, 1)	32	$\mathbb{Z}_2 \times S_5, (32)$
	QSRD(24, 11, 2; 5; 9, 5)	16	$A_4 : \mathbb{Z}_4, (16)$
	QSRD(24, 11, 9, 4; 10, 8, 6, 5, 4)	8	$(\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2, (8)$
	QSRD(24, 11, 10, 0; 11, 10, 0)	668	3888, (142), 92160, (462), $\mathbb{Z}_3 \times ((\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2), (40),$ $\mathbb{Z}_8 \times ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_2), (24)$
	QSRD(24, 11, 7, 6; 8, 3, 1)	32	$((\mathbb{Z}_2^3 : \mathbb{Z}_2^2) : (\mathbb{Z}_3 \times \mathbb{Z}_3)) : \mathbb{Z}_2, (28),$ $((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (4)$
	QSRD(24, 11, 7, 6; 8, 3, 2, 0)	16	$\mathbb{Z}_3 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), (16)$
	QSRD(24, 11, 7, 6; 8, 4, 2, 1)	32	$\mathbb{Z}_3 \times QD_8, (8), \mathbb{Z}_3 \times D_8, (8), \mathbb{Z}_3 \times (\mathbb{Z}_8 : \mathbb{Z}_2), (16)$
	QSRD(24, 11, 0, 5; 11, 5)	10	1320, (10)
	QSRD(24, 12, 9, 6; 9, 5, 4)	12	$D_4 \times S_3, (12)$
	QSRD(24, 12, 9, 6; 9, 6, 4)	24	$S_4 \times S_3, (24)$
	QSRD(24, 13, 11, 6; 9, 8, 7)	24	$S_4, (24)$
	QSRD(24, 13, 9, 6; 10, 8, 4)	32	$\mathbb{Z}_2 \times (\mathbb{Z}_4^2 : \mathbb{Z}_3), (32)$
	QSRD(24, 13, 11, 6; 10, 9, 8, 7, 6)	24	$\mathbb{Z}_2 \times A_4, (24)$
	QSRD(24, 14, 10, 8; 10, 8)	1054	1572864, (786), $\mathbb{Z}_2 \times S_4, (4), (A_4 : \mathbb{Z}_4) : \mathbb{Z}_2, (12),$ $\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2), (240),$ $(\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2, (12)$
QSRD(24, 14, 9, 8; 13, 12, 10, 8, 6)	36	$\mathbb{Z}_8 \times S_4, (12), \mathbb{Z}_2 \times \mathbb{Z}_4 \times S_4, (24)$	
QSRD(24, 14, 6, 8; 14, 8)	20	$(\mathbb{Z}_2 \cdot ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_2) = ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4) : \mathbb{Z}_3) \cdot \mathbb{Z}_2 : \mathbb{Z}_2, (20)$	
QSRD(24, 15, 13, 8; 12, 8)	240	$\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2), (240)$	
QSRD(24, 15, 12, 8; 13, 12, 8)	192	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2,$	
QSRD(24, 15, 10, 9; 15, 10, 9)	4	$SL(2, 5), (4)$	
QSRG(24, 2, 2, 0; 2, 0)	1	188743680	
QSRG(24, 2, 2, 0; 1, 0)	4	24576, $(\mathbb{Z}_3 \times \mathbb{Z}_3) : (((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2), 497664, D_{24}$	
QSRG(24, 3, 3, 0; 3, 0)	1	644972544	
QSRG(24, 3, 3, 0; 2, 0)	1	663552	

Tablica 4.30: Grafovi dobiveni konstrukcijom iz tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(S) ili Aut(S)
24	QSRG(24,3,3,0;2,1,0)	8	24576, $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$, $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$, $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2$, D_{24} , $((((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2$, $\mathbb{Z}_2 \times S_4$, $\mathbb{Z}_2 \times D_{12}$ $S_4 \times S_3$, $D_4 \times S_3$, $\mathbb{Z}_2 \times S_4$
	QSRG(24,3,3,0;1,0)	3	9172942848
	QSRG(24,4,4,0;4,0)	1	98304, 1179648
	QSRG(24,4,4,0;4,2,0)	2	
	QSRG(24,4,4,0;2,1,0)	66	$((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3$, \mathbb{Z}_2 , $\mathbb{Z}_2 \times S_3 \times D_4$, $(\mathbb{Z}_3 \times \mathbb{Z}_3) : (((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$, $\mathbb{Z}_2 \times \mathbb{Z}_2 \times S_4$, (2), $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2$, (2), $\mathbb{Z}_2 \times S_4$, (13), $\mathbb{Z}_2 \times D_{12}$, (2), $((((\mathbb{Z}_2 \times (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, \mathbb{Z}_2 , \mathbb{Z}_3 , $(\mathbb{Z}_2^3 : \mathbb{Z}_2^2)$, $D_4 \times S_3$, (4), $S_4 \times S_3$, (2), $((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, \mathbb{Z}_2 , $S_3 \times D_8$, (13), $\mathbb{Z}_3 : (\mathbb{Z}_8 : \mathbb{Z}_2^2)$, (2), D_{24} , (20), $D_8 \times S_3$, (2) 41472, $(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRG(24,4,4,0;3,2,1,0)	2	10368
	QSRG(24,4,4,0;3,1,0)	1	127401984
	QSRG(24,4,4,0;3,2,1,0)	7	$\mathbb{Z}_2 \times S_4$, (3), D_{24} , (4)
	QSRG(24,4,4,2;4,0)	1	127401984
	QSRG(24,4,4,1;2,1,0)	1	$((((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRG(24,4,4,1;1,0)	1	$((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$
	QSRG(24,4,4,0;1,0)	5	$GL(2,3) : \mathbb{Z}_2$, $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2$, (4)
	QSRG(24,5,5,0;4,0)	1	4147200
	QSRG(24,5,5,0;4,2,0)	227	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2$, $(\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2)) : \mathbb{Z}_2$, (116), $((\mathbb{Z}_2 \times ((\mathbb{Z}_2 \times (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, \mathbb{Z}_2 , (44) $D_{12} \times S_3$, $D_4 \times S_3$, (16), D_{24} , (8), $\mathbb{Z}_2 \times \mathbb{Z}_2 \times S_4$, (16), $S_3 \times D_8$, (12), $(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$, (44), $(S_3 \times S_3) : \mathbb{Z}_2$, (12), $D_8 \times S_3$, (2) $\mathbb{Z}_3 : (\mathbb{Z}_8 : \mathbb{Z}_2^2)$, $\mathbb{Z}_2 \times D_{12}$, (16), $\mathbb{Z}_2 \times S_3 \times D_4$, (84), $((((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2$, (44), $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$, (54), $\mathbb{Z}_2 \times S_3 \times S_4$, (19), $\mathbb{Z}_2 \times S_4 \times S_3$, (58), $\mathbb{Z}_2 \times D_4 \times S_3$, (36), $(\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$, (4), D_{24} , (8), $D_8 \times S_3$, (2), (44), $D_4 \times S_3$, (44), $S_3 \times D_8$, (12), $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2$, (4), $\mathbb{Z}_2 \times S_4$, (2), $((\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2$, (2)
	QSRG(24,5,5,0;3,2,1,0)	115	82944
	QSRG(24,5,5,0;4,1,0)	1	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRG(24,5,5,0;2,0)	1	$A_5 : D_4$
	QSRG(24,5,5,0;4,3,2,1,0)	9	D_{24} , $\mathbb{Z}_2 \times D_{12}$, (8)
	QSRG(24,5,5,0;3,2,0)	9	$((S_3 \times S_3) : \mathbb{Z}_2) \times D_4$, $\mathbb{Z}_2 \times D_{12}$, (8)
	QSRG(24,5,5,0;3,1,0)	1	$GL(2,3) : \mathbb{Z}_2$
	QSRG(24,5,5,2;2,0)	1	28800
	QSRG(24,5,5,0;4,2,1,0)	217	$(\mathbb{Z}_2 \times \mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2$, (36), $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$, (69) $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$, (72), $\mathbb{Z}_2 \times S_4$, (16), $D_4 \times S_3$, (8), $((((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2$, (16), $\mathbb{Z}_2 \times \mathbb{Z}_2 \times S_4$, (16), $D_{12} \times S_3$, $D_4 \times S_3$, (16), D_{24} , (8), $S_3 \times D_8$, (12), $(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$, (44), $(S_3 \times S_3) : \mathbb{Z}_2$, (12), $D_8 \times S_3$, (2), $\mathbb{Z}_2 \times S_4$ $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$, (54), $\mathbb{Z}_3 : (\mathbb{Z}_8 : \mathbb{Z}_2^2)$, $\mathbb{Z}_2 \times D_{12}$, (16), $\mathbb{Z}_2 \times S_3 \times D_4$, (84), $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3$, \mathbb{Z}_2 , (44), $\mathbb{Z}_2 \times S_3 \times S_4$, (19), $\mathbb{Z}_2 \times S_4 \times S_3$, (58), $\mathbb{Z}_2 \times D_4 \times S_3$, (36), $(\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$, (4), D_{24} , (8), $D_8 \times S_3$, (2), $D_4 \times S_3$, (44), $S_3 \times D_8$, (12), $(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2$, (4), $\mathbb{Z}_2 \times S_4$, (2), $((\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2$, (2), 10368, (66), 1536, (161) $\mathbb{Z}_2 \times D_{12}$, (8), D_{24} , (8)
	QSRG(24,5,5,0;4,2,0)	227	$\mathbb{Z}_2 \times D_{12}$, (8), $((S_3 \times S_3) : \mathbb{Z}_2) \times D_4$, (8)
	QSRG(24,5,5,0;4,3,2,1,0)	9	339738624
	QSRG(24,5,5,0;3,2,0)	9	$((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$, $\mathbb{Z}_3 : (\mathbb{Z}_8 : \mathbb{Z}_2^2)$, (32), $\mathbb{Z}_2 \times D_{12}$, (8), D_{24} , (4), $D_8 \times S_3$, (2), $S_3 \times D_8$, (12)
	QSRG(24,6,6,0;6,0)	1	2149908480000
	QSRG(24,6,6,0;2,0)	1	$A_5 : D_4$
	QSRG(24,6,6,0;6,4,2,0)	971	98304, (271), 196608, (700),
	QSRG(24,6,6,0;4,2,0)	275	2880, $\mathbb{Z}_2 \times S_4 \times D_4$, (144), $\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times A_4) : \mathbb{Z}_2)$, (36), $(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$, $\mathbb{Z}_2 \times D_4 \times S_4$, (34), $\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_5$, (16), $(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$, $\mathbb{Z}_3 : (\mathbb{Z}_2^3 : \mathbb{Z}_2^2)$, (104), $\mathbb{Z}_2 \times S_3 \times S_4$, (38), $\mathbb{Z}_2 \times S_4 \times S_3$, (116), $S_3 \times D_8$, (12), $D_4 \times S_3$, (56), $(\mathbb{Z}_4 \times S_3) : \mathbb{Z}_2$, (8), $\mathbb{Z}_2 \times D_{12}$, (16), $D_8 \times S_3$, (2), $(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$, $\mathbb{Z}_2 \times S_3 \times S_3$, (48), $\mathbb{Z}_3 : (((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$, (10), $((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2 \times S_3$, (151), $S_4 \times D_4$, (32), $((\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2) : \mathbb{Z}_2$, (20), $S_4 \times D_8$, (38), $\mathbb{Z}_3 : ((\mathbb{Z}_4^2 : \mathbb{Z}_2) : \mathbb{Z}_2)$, (36), $D_4 \times S_3$, (20), $\mathbb{Z}_3 : ((\mathbb{Z}_8 : \mathbb{Z}_2^2) : \mathbb{Z}_2)$, (12), $((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2) : \mathbb{Z}_2 \times S_3$, (12), $((\mathbb{Z}_8 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2 : \mathbb{Z}_2 \times S_3$, (17), $(S_3 \times S_3) : \mathbb{Z}_2$, (24), $\mathbb{Z}_3 : (((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2)$, (42), $\mathbb{Z}_3 : (((\mathbb{Z}_2^3 : \mathbb{Z}_4) : \mathbb{Z}_2) : \mathbb{Z}_2)$, (8)
	QSRG(24,6,6,0;3,2,1,0)	37	$D_{12} \times S_3$, $D_4 \times S_3$, (4), $\mathbb{Z}_2 \times \mathbb{Z}_2 \times S_4$, (16), $(S_3 \times S_3) : \mathbb{Z}_2$, (12), D_{24} , (4), 1152
	QSRG(24,6,6,0;3,2,0)	37	
	QSRG(24,6,6,0;4,3,2,1,0)	93	$S_3 \times D_8$, (12), $\mathbb{Z}_2 \times D_{12}$, $(\mathbb{Z}_6 \times S_3) : \mathbb{Z}_2$, (24), $\mathbb{Z}_2 \times \mathbb{Z}_2 \times S_4$, (32) $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2$, (8), $\mathbb{Z}_2 \times S_4$, (2), D_{24} , (12), $D_8 \times S_3$, (2)

Tablica 4.31: Grafovi dobiveni konstrukcijom iz tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(S) ili Aut(S)
24	QSRG(24, 6, 6, 0; 5, 4, 2, 0)	1	3072
	QSRG(24, 6, 6, 0; 6, 3, 0)	1	26873856
	QSRG(24, 6, 6, 2; 4, 3, 0)	1	41472
	QSRG(24, 6, 6, 2; 4, 2, 1, 0)	21	$\mathbb{Z}_3 : (\mathbb{Z}_8 : \mathbb{Z}_2^2), \mathbb{Z}_3 : (\mathbb{Z}_2^4 : \mathbb{Z}_2), (20),$
	QSRG(24, 6, 6, 0; 4, 2, 1)	1	$((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$
	QSRG(24, 6, 6, 1; 3, 2, 1, 0)	1	$(\mathbb{Z}_3 \times SL(2, 3)) : \mathbb{Z}_2$
	QSRG(24, 6, 6, 1; 2, 1, 0)	5	$(\mathbb{Z}_3 \times D_4) : \mathbb{Z}_2, ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3, (4)$
	QSRG(24, 6, 6, 0; 5, 4, 3, 2, 1, 0)	1	D_{24}
	QSRG(24, 6, 6, 2; 3, 2, 1, 0)	1	D_{24}
	QSRG(24, 6, 6, 0; 3, 2, 1)	1	$GL(2, 3) : \mathbb{Z}_2$
	QSRG(24, 7, 7, 0; 6, 4, 3, 2, 0)	9	$((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, D_4 \times S_3, (8)$
	QSRG(24, 7, 7, 0; 4, 2)	53	$5760, \mathbb{Z}_2 \times ((\mathbb{Z}_4 \times A_4) : \mathbb{Z}_2), (36), \mathbb{Z}_2 \times \mathbb{Z}_2 \times A_5, (16)$
	QSRG(24, 7, 7, 0; 6, 2, 0)	1	2073600
	QSRG(24, 7, 7, 0; 6, 4, 3, 0)	73	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (25),$ $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (22),$ $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (6),$ $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2, (12), \mathbb{Z}_2 \times S_4, (8)$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, D_4 \times S_3, (12)$
	QSRG(24, 7, 7, 0; 6, 4, 3, 2, 1, 0)	13	$\mathbb{Z}_2 \times S_4, D_4 \times S_3, (12)$
	QSRG(24, 7, 7, 0; 5, 4, 3, 0)	13	$1536, (357), 10368, (66)$
	QSRG(24, 7, 7, 0; 6, 4, 2, 0)	423	$((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRG(24, 7, 7, 0; 6, 5, 3, 2, 0)	1	$\mathbb{Z}_3 : (\mathbb{Z}_2^4 : \mathbb{Z}_2)$
	QSRG(24, 7, 7, 0; 4, 2, 1, 0)	1	D_{24}
	QSRG(24, 7, 7, 0; 6, 5, 4, 3, 2, 1, 0)	1	$D_{12} \times S_3, D_4 \times S_3, (4), \mathbb{Z}_2 \times \mathbb{Z}_2 \times S_4, (16), (S_3 \times S_3) : \mathbb{Z}_2, (12)$
	QSRG(24, 7, 7, 0; 5, 4, 2, 0)	33	$((S_3 \times S_3) : \mathbb{Z}_2) \times D_4, (\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2), (44), \mathbb{Z}_2 \times D_{12}, (8)$
	QSRG(24, 7, 7, 0; 6, 3, 2, 0)	53	20736
	QSRG(24, 7, 7, 0; 6, 2, 1, 0)	1	10368
	QSRG(24, 7, 7, 0; 4, 3, 2, 0)	1	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2), S_3 \times D_8, (12), D_8 \times S_3, (2)$
	QSRG(24, 7, 7, 0; 4, 3, 0)	15	$\mathbb{Z}_2 \times S_4 \times S_3, D_4 \times S_3, (12)$
	QSRG(24, 7, 7, 0; 4, 3, 0)	13	82944
	QSRG(24, 7, 7, 0; 6, 3, 0)	1	$A_5 : D_4$
	QSRG(24, 7, 7, 0; 4, 2, 0)	1	1152
	QSRG(24, 7, 7, 2; 4, 2, 0)	1	$D_{24}, D_8 \times S_3, (2), S_3 \times D_8, (12)$
	QSRG(24, 7, 7, 0; 5, 4, 2, 1, 0)	15	D_{24}
	QSRG(24, 7, 7, 0; 5, 4, 3, 2, 1)	1	$D_4 \times S_3$
	QSRG(24, 7, 7, 2; 4, 2, 1, 0)	1	$\mathbb{Z}_2 \times D_{12}$
	QSRG(24, 7, 7, 0; 6, 5, 4, 3, 2, 0)	1	$PSL(3, 2) : \mathbb{Z}_2$
	QSRG(24, 8, 8, 4; 8, 0)	1	13759414272
	QSRG(24, 8, 8, 2; 4, 2)	39	$A_5 : D_4, D_4 \times A_5, (18), (\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2, (8), D_4 \times A_4, (12)$
	QSRG(24, 9, 9, 6; 9, 0)	1	1934917632
	QSRG(24, 9, 9, 0; 8, 7, 6, 0)	309	$2304, \mathbb{Z}_2 \times ((\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)), (228),$ $(\mathbb{Z}_2 \times \mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_2, (12),$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_3)) : \mathbb{Z}_2) : \mathbb{Z}_2, (24),$ $((\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (22),$ $((\mathbb{Z}_2 \times (\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (6), \mathbb{Z}_2 \times S_4,$ $(8), \mathbb{Z}_2 \times D_{12}, (8)$
	QSRG(24, 9, 9, 0; 8, 6, 0)	1	165888
	QSRG(24, 9, 9, 0; 9, 6, 0)	1	80621568
	QSRG(24, 9, 9, 0; 9, 6, 3)	1	26873856
	QSRG(24, 9, 9, 0; 7, 6, 0)	9	$S_3 \times S_4, D_4 \times S_3, (8)$
	QSRG(24, 10, 10, 8; 10, 0)	1	4246732800
	QSRG(24, 10, 10, 4; 10, 4, 0)	1	491520
	QSRG(24, 10, 10, 4; 8, 4, 2, 0)	1	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)$
	QSRG(24, 10, 10, 4; 5, 4, 0)	1	$\mathbb{Z}_2 \times S_5$
	QSRG(24, 10, 10, 4; 4, 2)	57	$(\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2, (25), ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_4) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (9),$ $((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (17),$ $((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4) : \mathbb{Z}_3 : \mathbb{Z}_2, (3), (((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (3)$
	QSRG(24, 10, 10, 4; 6, 4, 2)	25	$\mathbb{Z}_2 \times A_4$
	QSRG(24, 10, 10, 4; 5, 4, 3, 2)	1	S_4
	QSRG(24, 10, 10, 4; 4, 3)	1	S_4
	QSRG(24, 10, 10, 0; 9, 8, 0)	791	$D_{24}, (\mathbb{Z}_3 \times \mathbb{Z}_3) : (\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2, (228), 6144, (138), 62208, (424),$
	QSRG(24, 10, 10, 0; 10, 8, 0)	1	5898240
	QSRG(24, 10, 10, 4; 8, 4, 1)	1	$((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$
	QSRG(24, 10, 10, 3; 8, 6, 4, 2)	1	$((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$
	QSRG(24, 11, 11, 4; 8, 6, 4)	48	$\mathbb{Z}_2 \times ((A_4 \times \mathbb{Z}_4) : \mathbb{Z}_2), (24), \mathbb{Z}_2 \times ((\mathbb{Z}_2 \times S_4) : \mathbb{Z}_2), (24)$
	QSRG(24, 11, 11, 4; 8, 6, 5, 4)	30	$D_4 \times S_3, (8), \mathbb{Z}_2 \times D_{12}, (16), \mathbb{Z}_2 \times S_4, (6),$
	QSRG(24, 11, 11, 4; 8, 5, 4)	10	$S_3 \times S_4, (6), S_4 \times S_3, (4),$
	QSRG(24, 11, 11, 0; 10, 0)	745	958003200
	QSRG(24, 12, 12, 4; 12, 8, 6)	361	589824
	QSRG(24, 12, 12, 6; 7, 6, 5, 4)	16	$\mathbb{Z}_3 : (\mathbb{Z}_8 : \mathbb{Z}_2^2)$
	QSRG(24, 14, 14, 8; 8, 6)	20	$((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (9),$ $((\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_4) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2, (10),$ $((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_4) : \mathbb{Z}_2 : \mathbb{Z}_3 : \mathbb{Z}_2, (9)$
	QSRG(24, 14, 14, 6; 12, 7)	168	241920
	QSRG(24, 14, 14, 8; 8, 7)	6	$PSL(3, 2) : \mathbb{Z}_2$
	QSRG(24, 15, 15, 8; 12, 10)	252	17280
	QSRG(24, 16, 16, 10; 12, 10)	54	$A_5 : D_4, (16), D_4 \times A_5, (18), D_4 \times A_4, (12), (\mathbb{Z}_2 \times \mathbb{Z}_2 \times A_4) : \mathbb{Z}_2, (8)$

Tablica 4.32: Grafovi dobiveni konstrukcijom iz tranzitivnih neregularnih permutacijskih grupa stupnja $n = 24$

Stupanj	Parametri	# neizom.	Aut(S) ili Aut(S)
25	QSRD(25,1,0,0;1,0)	1	$(\mathbb{Z}_5^4 : A_5) : \mathbb{Z}_{10}$
	QSRD(25,2,0,0;2,1,0)	1	$\mathbb{Z}_5 \times D_5$
	QSRD(25,3,0,0;3,2,1,0)	1	$\mathbb{Z}_5 \times D_5$
	QSRD(25,3,0,0;2,1,0)	2	$(\mathbb{Z}_5 \times \mathbb{Z}_5) : S_3, \mathbb{Z}_5 \times D_5$
	QSRD(25,3,2,0;2,1,0)	1	$\mathbb{Z}_5 \times D_5$
	QSRD(25,4,2,0;3,2,1,0)	1	$\mathbb{Z}_5 \times D_5$
	QSRD(25,4,0,0;4,2,1,0)	1	$\mathbb{Z}_5 \times D_5$
	QSRD(25,4,2,0;4,2,1,0)	1	$\mathbb{Z}_5 \times D_5$
	QSRD(25,4,0,0;4,3,0)	1	$\mathbb{Z}_5 \times S_5$
	QSRD(25,4,0,0;2,1,0)	1	$(\mathbb{Z}_5 \times \mathbb{Z}_5) : \mathbb{Z}_4$
	QSRD(25,5,4,0;3,2,1,0)	1	$\mathbb{Z}_5 \times D_5$
	QSRD(25,5,0,0;4,3,2,1,0)	3	$\mathbb{Z}_5 \times S_5 (2), \mathbb{Z}_5 \times D_5$
	QSRD(25,5,0,0;5,0)	1	$A_5^5 : (\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_5))$
	QSRD(25,5,2,0;5,2,1,0)	1	$\mathbb{Z}_5 \times D_5$
	QSRD(25,6,4,0;4,3,2,1,0)	1	$\mathbb{Z}_5 \times D_5$
	QSRD(25,7,4,0;5,4,2,1,0)	1	$\mathbb{Z}_5 \times D_5$
	QSRD(25,7,4,0;6,4,3,2,1,0)	1	$\mathbb{Z}_5 \times D_5$
	QSRD(25,8,6,2;6,4,3,2,1,0)	3	$\mathbb{Z}_5 \times D_5, \mathbb{Z}_{25} (2)$
	QSRD(25,8,2,2;5,4,3,2,1,0)	2	\mathbb{Z}_{25}
	QSRD(25,8,2,2;6,5,4,3,2,1)	1	\mathbb{Z}_{25}
	QSRD(25,8,6,0;8,6,4,3,0)	3	$\mathbb{Z}_5 \times D_5, \mathbb{Z}_{25} (2)$
	QSRD(25,8,6,0;6,5,3,2,1,0)	3	$\mathbb{Z}_5 \times D_5, \mathbb{Z}_{25} (2)$
	QSRD(25,8,6,0;8,7,6,5,4,3,2,1,0)	1	\mathbb{Z}_{25}
	QSRD(25,6,2,0;4,3,2,1,0)	1	$(\mathbb{Z}_5 \times \mathbb{Z}_5) : \mathbb{Z}_4$
	QSRD(25,6,4,0;6,4,3,2,1,0)	1	$\mathbb{Z}_5 \times D_5$
	QSRD(25,6,2,0;6,4,3,2,1,0)	1	$\mathbb{Z}_5 \times D_5$
	QSRD(25,8,0,2;7,5,4,3,2,1,0)	1	\mathbb{Z}_{25}
	QSRD(25,8,6,2;5,4,3,2,1,0)	1	\mathbb{Z}_{25}
	QSRG(25,9,8,0;8,5,4,3,0)	2	$\mathbb{Z}_5 \times S_5, \mathbb{Z}_{25}$
	QSRG(25,2,0;1,0)	2	$D_{25}, \mathbb{Z}_5^3 : (\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : S_5))$
	QSRG(25,4,0;2,1,0)	6	$(\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4, D_{25} (4), \mathbb{Z}_{25} : \mathbb{Z}_4$
	QSRG(25,4,0;3,2,1,0)	1	D_{25}
	QSRG(25,6,2;2,1,0)	3	$(\mathbb{Z}_5 \times \mathbb{Z}_5) : D_6, D_{25} (2)$
	QSRG(25,6,0;4,3,2,1,0)	7	$D_5 \times D_5, D_{25} (6)$
	QSRG(25,6,2,0;5,2,1,0)	1	$\mathbb{Z}_5 \times S_5$
	QSRG(25,6,0;5,4,3,2,1,0)	1	D_{25}
	QSRG(25,6,0;3,2,1,0)	2	D_{25}
	QSRG(25,6,2;3,2,1,0)	1	D_{25}
	QSRG(25,8,0;6,5,4,3,2,1)	1	D_{25}
	QSRG(25,8,0;6,4,3,0)	2	$S_5 \times D_5, D_{25}$
	QSRG(25,8,0;7,6,5,4,3,2,1,0)	1	D_{25}
QSRG(25,10,0;10,5)	1	$A_5^5 : (\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)$	
26	DSRG(26,11,4,5,7)	4	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	DSRG(26,12,5,6,6)	16	$D_{13} (9), \mathbb{Z}_{13} : \mathbb{Z}_6 (3), \mathbb{Z}_{13} : \mathbb{Z}_4 (2),$ $\mathbb{Z}_{13} : \mathbb{Z}_{12} (2)$
	QSRD(26,1,0,0;1,0)	1	$\mathbb{Z}_{13} : D_{13}$
	QSRD(26,2,0,0;2,1,0)	4	$\mathbb{Z}_{13} \times D_{13}$
	QSRD(26,2,0,0;2,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^{12} : \mathbb{Z}_{13})$
	QSRD(26,2,0,0;1,0)	1	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,3,0,0;3,2,1,0)	2	$\mathbb{Z}_{13} \times D_{13}$
	QSRD(26,3,0,0;2,1,0)	3	$(\mathbb{Z}_{13} \times \mathbb{Z}_{13}) : (\mathbb{Z}_3 \times S_3), \mathbb{Z}_{13} \times D_{13},$ $\mathbb{Z}_2 \times (\mathbb{Z}_{13} : \mathbb{Z}_3)$
	QSRD(26,3,2,0;2,1,0)	2	$\mathbb{Z}_{13} \times D_{13}$
	QSRD(26,3,2,0;3,2,1,0)	1	$\mathbb{Z}_{13} \times D_{13}$
	QSRD(26,3,1,0;1,0)	1	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,4,1,0;2,1,0)	3	$\mathbb{Z}_2 \times (\mathbb{Z}_{13} : \mathbb{Z}_3) (2), \mathbb{Z}_{13} : \mathbb{Z}_6$
	QSRD(26,4,2,0;4,3,2,1,0)	1	$\mathbb{Z}_{13} \times D_{13}$
	QSRD(26,4,0,0;4,2,0)	4	$\mathbb{Z}_2 \times (\mathbb{Z}_2^{12} : \mathbb{Z}_{13})$
	QSRD(26,4,2,0;2,1,0)	2	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,4,0,0;2,1,0)	2	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,5,1,0;2,0)	1	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,5,1,0;3,2,1,0)	1	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,6,2,1;2,1,0)	2	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,6,0,0;4,2,0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_2^{12} : (\mathbb{Z}_{13} : \mathbb{Z}_3)),$ $\mathbb{Z}_2 \times (\mathbb{Z}_2^{12} : \mathbb{Z}_{13})$
	QSRD(26,6,3,0;3,2,1)	2	$\mathbb{Z}_{13} : \mathbb{Z}_6$
	QSRD(26,6,4,0;4,2,0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_2^{12} : \mathbb{Z}_{13})$
	QSRD(26,6,4,0;6,4,2,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^{12} : \mathbb{Z}_{13})$
	QSRD(26,6,4,0;4,3,2,1,0)	1	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,6,0,0;4,3,2,0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_{13} : \mathbb{Z}_3), \mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,6,4,0;3,2,0)	2	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,6,0,0;3,0)	1	$\mathbb{Z}_{13} : \mathbb{Z}_{12}$
	QSRD(26,7,3,2;3,2,1)	2	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,7,3,2;3,2,1,0)	2	$\mathbb{Z}_{13} : \mathbb{Z}_4$

Tablica 4.33: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n \in \{25, 26\}$

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
26	QSRD(26,7,1,0;5,4,3,0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_{13} : \mathbb{Z}_3), \mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,7,5,0;4,3,0)	2	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,7,1,0;4,0)	1	$\mathbb{Z}_{13} : \mathbb{Z}_{12}$
	QSRD(26,8,4,0;8,6,4,2,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^{12} : \mathbb{Z}_{13})$
	QSRD(26,6,0,0;6,4,2,0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_2^{12} : \mathbb{Z}_{13})$
	QSRD(26,8,4,0;6,5,4,0)	1	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,8,4,0;5,0)	1	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,9,5,2;5,4,3,2)	2	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,9,5,0;7,6,0)	2	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,9,6,2;6,4,3)	1	$\mathbb{Z}_{13} : \mathbb{Z}_6$
	QSRD(26,9,6,0;76,5,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_{13} : \mathbb{Z}_3)$
	QSRD(26,9,6,3;5,3,2,0)	1	$\mathbb{Z}_{13} : \mathbb{Z}_6$
	QSRD(26,10,5,4;5,4,3)	1	D_{13}
	QSRD(26,10,6,4;5,4,3)	1	D_{13}
	QSRD(26,10,7,0;9,8,7,0)	10	$\mathbb{Z}_2 \times (\mathbb{Z}_{13} : \mathbb{Z}_3), \mathbb{Z}_{26} (9)$
	QSRD(26,10,7,0;10,9,8,7,0)	4	\mathbb{Z}_{26}
	QSRD(26,10,8,0;9,8,7,0)	4	\mathbb{Z}_{26}
	QSRD(26,10,8,0;10,9,8,7,0)	1	\mathbb{Z}_{26}
	QSRD(26,10,9,0;9,8,7,0)	4	\mathbb{Z}_{26}
	QSRD(26,10,9,0;10,9,8,7,0)	1	\mathbb{Z}_{26}
	QSRD(26,10,8,0;8,7,0)	1	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,11,6,5;5,4)	1	D_{13}
	QSRD(26,11,6,4;6,5,4,3)	1	D_{13}
	QSRD(26,11,2,4;8,6,4,2,1,0)	2	\mathbb{Z}_{26}
	QSRD(26,11,2,4;8,6,5,4,0)	2	\mathbb{Z}_{26}
	QSRD(26,11,9,0;10,9,0)	1	$\mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRD(26,11,9,0;11,10,9,0)	5	\mathbb{Z}_{26}
	QSRD(26,11,10,0;11,10,9,0)	1	\mathbb{Z}_{26}
	QSRD(26,12,11,0;12,11,0)	1	\mathbb{Z}_{26}
	QSRD(26,13,6,6;13,12,6)	2	\mathbb{Z}_{26}
	QSRD(26,13,7,6;10,7,4)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_{13} : \mathbb{Z}_3)$
	QSRD(26,14,12,6;14,11,10,8,6)	1	\mathbb{Z}_{26}
	QSRG(26,2,0;1,0)	2	$(\mathbb{Z}_{13} \times \mathbb{Z}_{13}) : D_4, D_{26}$
	QSRG(26,3,0;2,1,0)	2	D_{26}
	QSRG(26,3,0;1,0)	2	$\mathbb{Z}_{13} : \mathbb{Z}_4, \mathbb{Z}_{13} : \mathbb{Z}_6$
	QSRG(26,4,0;1,0)	1	$PSL(3,3) : \mathbb{Z}_2$
	QSRG(26,4,0;3,2,1,0)	2	$(\mathbb{Z}_{13} \times \mathbb{Z}_{13}) : D_4, D_{26}$
	QSRG(26,4,0;2,1,0)	7	$(\mathbb{Z}_{13} \times \mathbb{Z}_{13}) : ((\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_2),$ $\mathbb{Z}_2 \times (\mathbb{Z}_{13} : \mathbb{Z}_4), D_{26} (5)$
	QSRG(26,4,0;4,2,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^{12} : \mathbb{Z}_3)$
	QSRG(26,5,0;4,3,2,1,0)	2	D_{26}
	QSRG(26,5,0;3,2,1,0)	3	$D_{26} (2), \mathbb{Z}_{13} : \mathbb{Z}_4$
	QSRG(26,5,0;2,1,0)	5	$D_{26} (3), \mathbb{Z}_2 \times (\mathbb{Z}_{13} : \mathbb{Z}_4) (2)$
	QSRG(26,6,2;3,0)	1	$(\mathbb{Z}_{13} \times \mathbb{Z}_{13}) : (\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2))$
	QSRG(26,6,2;4,2,1,0)	2	D_{26}
QSRG(26,6,0;4,2,1,0)	5	$D_{26} (4), \mathbb{Z}_{13} : \mathbb{Z}_4$	
QSRG(26,6,0;4,3,2,0)	2	D_{26}	
QSRG(26,6,0;3,2,0)	2	$\mathbb{Z}_{13} : \mathbb{Z}_6, \mathbb{Z}_2 \times (\mathbb{Z}_{13} : \mathbb{Z}_6)$	
QSRG(26,6,0;4,3,2,1,0)	6	D_{26}	
QSRG(26,6,2;2,1,0)	3	$\mathbb{Z}_{13} : \mathbb{Z}_4, D_{26} (2)$	
QSRG(26,6,0;3,2,1,0)	2	D_{26}	
QSRG(26,6,2;3,2,1,0)	1	D_{26}	
QSRG(26,6,1;3,2,1,0)	1	$\mathbb{Z}_{13} : \mathbb{Z}_4$	
QSRG(26,6,0;5,4,3,2,1,0)	1	D_{26}	
QSRG(26,7,0;4,3,0)	2	$\mathbb{Z}_{13} : \mathbb{Z}_6, \mathbb{Z}_2 \times (\mathbb{Z}_{13} : \mathbb{Z}_6)$	
QSRG(26,7,0;6,5,4,3,2,1,0)	2	D_{26}	
QSRG(26,7,0;5,4,3,2,1,0)	1	D_{26}	
QSRG(26,7,0;4,3,2,1,0)	3	D_{26}	
QSRG(26,7,0;4,3,2,1)	1	D_{26}	
QSRG(26,7,0;5,4,3,2,0)	2	D_{26}	
QSRG(26,8,0;8,6,4,2,0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^{12} : \mathbb{Z}_{13}) : \mathbb{Z}_2)$	
QSRG(26,8,0;6,4,3,2,1)	2	D_{26}	
QSRG(26,8,0;8,4,2)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^{12} : \mathbb{Z}_{13}) : \mathbb{Z}_4)$	
QSRG(26,8,0;5,4,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_{13} : \mathbb{Z}_4)$	
QSRG(26,8,3;4,3,2,1,0)	1	$\mathbb{Z}_{13} : \mathbb{Z}_4$	
QSRG(26,8,0;6,5,4,3,2,1,0)	1	D_{26}	
QSRG(26,8,0;6,5,4,3,0)	1	D_{26}	
QSRG(26,8,0;7,6,5,4,3,0)	1	D_{26}	
QSRG(26,9,0;7,6,5,0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_{13} : \mathbb{Z}_4), D_{26}$	
QSRG(26,9,0;8,7,6,5,4,3,2,1)	1	D_{26}	
QSRG(26,9,0;8,7,6,5,0)	1	D_{26}	
QSRG(26,9,0;6,0)	1	$PSL(3,3) : \mathbb{Z}_2$	
QSRG(26,10,0;9,8,7,0)	1	D_{26}	
QSRG(26,10,0;8,7,0)	2	$D_{13}, \mathbb{Z}_{13} : \mathbb{Z}_6$	
QSRG(26,11,0;10,9,0)	1	D_{26}	
QSRG(26,12,4;12,6)	1	638976	
QSRG(26,12,0;11,0)	1	12454041600	
QSRG(26,14,6;12,11,10,8,6)	2	D_{26}	

Tablica 4.34: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
27	DSRG(27,8,3,2,4)	3	$\mathbb{Z}_9 : \mathbb{Z}_6 (2),$
	DSRG(27,10,3,4,6)	7	$((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : (\mathbb{Z}_2 \times \mathbb{Z}_2)$
			$\mathbb{Z}_9 : \mathbb{Z}_6 (4), ((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : (\mathbb{Z}_2 \times \mathbb{Z}_2) (3)$
	QSRD(27,7,0,0;6,5,0)	6	$\mathbb{Z}_9 : \mathbb{Z}_6 (2), \mathbb{Z}_9 : \mathbb{Z}_3 (3),$ $(\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_6$
	QSRD(27,7,2,0;7,6,3,2,0)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,7,4,0;6,5,4,3,2,1,0)	2	$\mathbb{Z}_9 \times S_3$
	QSRD(27,7,2,0;6,5,3,2,1,0)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,7,0,0;7,6,5,0)	4	$\mathbb{Z}_3 \times D_9,$ $((\mathbb{Z}_9 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2 : \mathbb{Z}_2$
	QSRD(27,7,4,0;7,5,4,2,1,0)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,7,2,2;3,2,1)	6	$\mathbb{Z}_9 : \mathbb{Z}_6 (4), (\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_6$
	QSRD(27,7,4,1;4,3,2,1,0)	10	$\mathbb{Z}_9 : \mathbb{Z}_3$
	QSRD(27,7,4,1;3,2,1,0)	4	$\mathbb{Z}_9 : \mathbb{Z}_3$
	QSRD(27,7,6,0;6,5,3,2,1,0)	2	$((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_9) : \mathbb{Z}_2,$ $(\mathbb{Z}_{27} : \mathbb{Z}_3) : \mathbb{Z}_3$
	QSRD(27,7,4,2;4,2,1,0)	1	$\mathbb{Z}_9 : \mathbb{Z}_3$
	QSRD(27,7,6,0;4,3,2,1)	1	$((\mathbb{Z}_9 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(27,11,8,4;6,5,4,3)	1	$\mathbb{Z}_9 : \mathbb{Z}_3$
	QSRD(27,15,8,8;11,8)	6	$\mathbb{Z}_9 : \mathbb{Z}_6 (4), (\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_6$
	QSRD(27,1,0,0;1,0)	2	$(\mathbb{Z}_9^3 : \mathbb{Z}_3) : \mathbb{Z}_2, 7142567040$
	QSRD(27,2,0,0;2,1,0)	6	$(\mathbb{Z}_9^3 : \mathbb{Z}_3) : \mathbb{Z}_2 (3),$ $\mathbb{Z}_3 \times D_9, \mathbb{Z}_9 \times S_3$
	QSRD(27,2,0,0;1,0)	3	$\mathbb{Z}_9 : \mathbb{Z}_6 (2), (\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_6$
	QSRD(27,3,0,0;1,0)	4	$\mathbb{Z}_9 : \mathbb{Z}_6 (2), (\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_6,$ $((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(27,3,2,0;1,0)	2	$\mathbb{Z}_9 : \mathbb{Z}_6$
	QSRD(27,3,0,0;2,1,0)	11	$\mathbb{Z}_9 : \mathbb{Z}_6 (2),$ $\mathbb{Z}_9 \times S_3 (6),$ $((\mathbb{Z}_9 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2 (2),$ $(\mathbb{Z}_3^3 : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(27,3,2,0;3,2,1,0)	1	$(\mathbb{Z}_9^3 : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(27,3,2,0;2,1,0)	1	$\mathbb{Z}_3 \times D_9$
	QSRD(27,3,0,0;3,2,1,0)	1	$\mathbb{Z}_3 \times D_9$
	QSRD(27,3,0,0;3,0)	2	90699264, 1632586752
	QSRD(27,4,0,0;3,2,1,0)	14	$\mathbb{Z}_9 \times S_3 (4),$ $(\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_6 (2),$ $\mathbb{Z}_9 : \mathbb{Z}_6 (2), (\mathbb{Z}_{27} : \mathbb{Z}_3) : \mathbb{Z}_3 (2),$ $(\mathbb{Z}_3^3 : \mathbb{Z}_3) : \mathbb{Z}_3 (1),$ $((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_9) : \mathbb{Z}_2 (2),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2 (1)$
	QSRD(27,4,0,0;2,1,0)	16	$((\mathbb{Z}_9 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2 (4),$ $\mathbb{Z}_9 \times S_3 (5),$ $\mathbb{Z}_9 : \mathbb{Z}_6 (2), \mathbb{Z}_3 \times D_9 (1),$ $(\mathbb{Z}_3^3 : \mathbb{Z}_3) : \mathbb{Z}_2 (1),$ $(\mathbb{Z}_3^2 : \mathbb{Z}_3) : \mathbb{Z}_2^2 (1),$ $((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2 (1),$ $\mathbb{Z}_3^3 : \mathbb{Z}_3$
	QSRD(27,4,0,0;4,2,1,0)	8	$\mathbb{Z}_9 \times S_3 (6), \mathbb{Z}_3 \times D_9,$ $\mathbb{Z}_3 \times ((S_3 \times S_3) : \mathbb{Z}_2)$
	QSRD(27,4,2,0;2,1,0)	8	$\mathbb{Z}_9 \times S_3 (2), \mathbb{Z}_3 \times D_9 (2), \mathbb{Z}_9 : \mathbb{Z}_6 (4)$
	QSRD(27,4,2,1;2,1,0)	2	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_6$
	QSRD(27,4,0,0;4,3,2,1,0)	1	$\mathbb{Z}_3 \times D_9$
	QSRD(27,4,2,0;3,2,1,0)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,4,2,0;4,2,1,0)	1	$\mathbb{Z}_3 \times D_9$
	QSRD(27,4,0,0;4,1,0)	1	$((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_4$
	QSRD(27,4,0,0;1,0)	1	$(\mathbb{Z}_3 \times \mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3$
	QSRD(27,5,4,0;2,1,0)	3	$\mathbb{Z}_9 : \mathbb{Z}_6 (2), \mathbb{Z}_9 \times S_3$
	QSRD(27,5,0,0;3,2,0)	2	$\mathbb{Z}_9 : \mathbb{Z}_6$
	QSRD(27,5,0,0;4,3,2,0)	4	$\mathbb{Z}_9 : \mathbb{Z}_6 (2),$ $(\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_6 (2)$
QSRD(27,5,0,0;4,3,2,1,0)	12	$\mathbb{Z}_9 \times S_3 (6), (\mathbb{Z}_{27} : \mathbb{Z}_3) : \mathbb{Z}_3 (2),$ $(\mathbb{Z}_3^3 : \mathbb{Z}_3) : \mathbb{Z}_3,$ $((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_9) : \mathbb{Z}_2 (2),$ $\mathbb{Z}_3 \times ((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2$	
QSRD(27,5,2,0;3,2,1,0)	5	$\mathbb{Z}_9 \times S_3 (3), (\mathbb{Z}_{27} : \mathbb{Z}_3) : \mathbb{Z}_3,$ $((\mathbb{Z}_3^3 : \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2$	
QSRD(27,5,2,0;4,3,2,1,0)	2	$\mathbb{Z}_3 \times D_9, \mathbb{Z}_9 \times S_3$	
QSRD(27,5,4,0;3,2,1,0)	1	$\mathbb{Z}_9 \times S_3$	

Tablica 4.35: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 27$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
27	QSRD(27,5,0,0;5,4,3,2,1,0)	1	$\mathbb{Z}_3 \times D_9$
	QSRD(27,5,0,0;5,3,2,0)	4	$\mathbb{Z}_3 \times D_9, \mathbb{Z}_9 \times S_3 (2),$ $\mathbb{Z}_3 \times ((S_3 \times S_3) : \mathbb{Z}_2)$
	QSRD(27,5,2,0;5,3,2,1,0)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,5,0,0;5,2,1,0)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,5,0,0;3,2,1,0)	4	$\mathbb{Z}_3^3 : \mathbb{Z}_3 (2),$ $((\mathbb{Z}_9 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_3,$ $(\mathbb{Z}_3^3 : \mathbb{Z}_3) \times S_3$
	QSRD(27,5,4,0;4,3,2,1,0)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,5,0,0;5,3,1,0)	1	$((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_4$
	QSRD(27,6,0,0;5,4,3,2,1,0)	2	$\mathbb{Z}_9 \times S_3$
	QSRD(27,6,0,0;4,3,2,1,0)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,6,4,0;4,3,2,1,0)	5	$\mathbb{Z}_9 \times S_3 (4), \mathbb{Z}_3 \times D_9$
	QSRD(27,6,4,0;5,4,3,2,1,0)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,6,2,0;5,4,3,2,1,0)	2	$\mathbb{Z}_9 \times S_3$
	QSRD(27,6,4,0;6,4,3,2,1,0)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,6,0,0;6,3,2,1,0)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,6,4,1;3,2,1,0)	4	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_6$
	QSRD(27,6,2,1;2,1)	4	$\mathbb{Z}_9 : \mathbb{Z}_6 (2),$ $((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : (\mathbb{Z}_2 \times \mathbb{Z}_2) (2)$
	QSRD(27,6,0,0;5,4,3,0)	5	$\mathbb{Z}_9 : \mathbb{Z}_6 (2), ((\mathbb{Z}_9 : \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2 (2),$ $(\mathbb{Z}_3^3 : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(27,6,0,1;2,0)	2	$\mathbb{Z}_9 : \mathbb{Z}_6$
	QSRD(27,6,2,1;4,3,2,1,0)	3	$\mathbb{Z}_9 : \mathbb{Z}_6 (2), (\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_6$
	QSRD(27,6,0,0;6,5,4,3,0)	1	$\mathbb{Z}_3 \times D_9$
	QSRD(27,6,2,0;4,3,2,1,0)	1	$\mathbb{Z}_3 \times D_9$
	QSRD(27,6,2,0;6,3,2,1,0)	1	$\mathbb{Z}_3 \times D_9$
	QSRD(27,6,0,1;6,3,1,0)	1	$(\mathbb{Z}_3^3 : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(27,6,0,0;4,0)	1	$((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(27,6,0,0;6,3,0)	4	90699264 (3), 181398528
	QSRD(27,8,0,2;6,5,4,3,2,1,0)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,8,0,2;5,4,3,2,1,0)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,8,0,2;6,4,3,2,1)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,8,4,0;8,7,4,3,0)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,8,4,0;7,6,4,3,2,1,0)	1	$\mathbb{Z}_9 \times S_3$
	QSRD(27,8,6,2;4,3,2,1)	2	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_6$
	QSRD(27,8,2,2;4,3,2)	7	$\mathbb{Z}_0 : \mathbb{Z}_6 (4), (\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_6 (2),$ $((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(27,8,6,0;7,6,4,3,2,1,0)	2	$((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_9) : \mathbb{Z}_2,$ $(\mathbb{Z}_{27} : \mathbb{Z}_3) : \mathbb{Z}_3$ $(\mathbb{Z}_3^3 : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(27,8,6,3;4,2,0)	1	$\mathbb{Z}_3 \times D_9$
	QSRD(27,8,2,2;6,4,3,2,0)	1	$\mathbb{Z}_3 \times D_9$
	QSRD(27,8,6,3;4,3,2,1,0)	1	$((\mathbb{Z}_3 \times \mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(27,8,0,2;4,1)	2	$(\mathbb{Z}_3 \times \mathbb{Z}_3 \times \mathbb{Z}_3) : QD_8,$ $((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_8$
	QSRD(27,8,6,0;8,6,5,2,1,0)	1	$((\mathbb{Z}_9 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(27,8,0,0;8,7,0)	2	$((\mathbb{Z}_9 \times S_3) : \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2, 1088640$
	QSRD(27,9,6,2;5,4,3,0)	1	$((\mathbb{Z}_9 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(27,9,6,0;9,6,3,0)	1	90699264
	QSRD(27,9,2,2;5,2)	1	$((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(27,9,0,0;9,0)	1	143354177519616000
	QSRD(27,10,8,3;6,4,2)	2	$\mathbb{Z}_9 : \mathbb{Z}_6$
	QSRD(27,12,8,5;8,5)	4	$\mathbb{Z}_9 : \mathbb{Z}_6 (2),$ $((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : (\mathbb{Z}_2 \times \mathbb{Z}_2) (2)$
	QSRD(27,12,8,4;8,4)	4	$\mathbb{Z}_9 : \mathbb{Z}_6 (2),$ $((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : (\mathbb{Z}_2 \times \mathbb{Z}_2) (2)$
	QSRD(27,12,12,5;6,4)	1	$((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(27,12,6,4;12,9,6,4)	1	$((\mathbb{Z}_3 \times \mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRD(27,12,8,5;8,6,4)	1	$((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : (\mathbb{Z}_2 \times \mathbb{Z}_2)$
	QSRD(27,8,0,3;8,3,1,0)	1	$((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : Q_4 : \mathbb{Z}_3$
	SRG(27,10,1,5)	1	$O(5,3) : \mathbb{Z}_2$
	QSRG(27,2,0;1,0)	2	$D_{27}, ((\mathbb{Z}_9^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRG(27,4,0;1,0)	1	$\mathbb{Z}_9 : \mathbb{Z}_6$
	QSRG(27,4,0;2,1,0)	6	$D_{27} (5), D_9 \times S_3$
	QSRG(27,4,0;3,2,1,0)	1	D_{27}
	QSRG(27,4,1;1,0)	1	$((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : D_4$
	QSRG(27,4,1;2,0)	1	2239488
	QSRG(27,6,1;2,1,0)	2	$((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : D_4,$ $((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : (\mathbb{Z}_2 \times \mathbb{Z}_2)$
	QSRG(27,6,0;4,3,2,1,0)	5	D_{27}
	QSRG(27,6,2;2,1,0)	3	$D_{27} (2), ((\mathbb{Z}_9 \times \mathbb{Z}_3) : \mathbb{Z}_3) : (\mathbb{Z}_2 \times \mathbb{Z}_2)$
QSRG(27,6,0;3,2,1,0)	2	D_{27}	
QSRG(27,6,2;3,2,1,0)	1	D_{27}	
QSRG(27,6,0;5,4,3,2,1,0)	1	D_{27}	
QSRG(27,6,0;2,1,0)	2	$D_{27}, ((\mathbb{Z}_9 \times \mathbb{Z}_3) : \mathbb{Z}_3) : (\mathbb{Z}_2 \times \mathbb{Z}_2)$	

Tablica 4.36: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 27$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
27	QSRG(27,6,1,3,1,0)	1	$((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRG(27,6,1,2,0)	1	$((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRG(27,6,0,6,3,0)	1	18139828
	QSRG(27,6,3,6,0)	1	13060694016
	QSRG(27,8,0,7,6,5,4,3,2,1,0)	1	D_{27}
	QSRG(27,8,1,3,0)	2	$(\mathbb{Z}_3^3 : \mathbb{Z}_3) : \mathbb{Z}_2^2$, $((\mathbb{Z}_3^2 : \mathbb{Z}_3) : Q_4) : \mathbb{Z}_3 : \mathbb{Z}_2$
	QSRG(27,8,2,5,3,2,1)	1	$\mathbb{Z}_9 : \mathbb{Z}_6$
	QSRG(27,8,0,6,4,3,2,1)	1	D_{27}
	QSRG(27,8,1,4,3,2)	1	$((\mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_3) : D_4$
	QSRG(27,8,0,6,5,2,1,0)	1	$((\mathbb{Z}_{27} : \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2$
	QSRG(27,8,1,4,2)	1	$((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2 : \mathbb{Z}_2$
	QSRG(27,10,3,6,4,2)	1	$\mathbb{Z}_9 : \mathbb{Z}_6$
	QSRG(27,12,4,9,6,4)	1	$((\mathbb{Z}_3^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2 : \mathbb{Z}_2$
	QSRG(27,12,3,12,6)	1	725594112
	QSRG(27,16,7,14,8)	1	2177280
	DRT(27,13,6,7)	1	$((\mathbb{Z}_3 \times \mathbb{Z}_3 \times \mathbb{Z}_3) : \mathbb{Z}_{13}) : \mathbb{Z}_3$
	28	DSRG(28,12,4,6,6)	6
DSRG(28,13,6,6,7)		5	$(\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^{12} : \mathbb{Z}_7)) : \mathbb{Z}_2, 688128, (2), \mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_6), (2)$
QSRD(28,1,0,0,1,0)		3	$\mathbb{Z}_7 \times ((\mathbb{Z}_7 \times \mathbb{Z}_7 \times \mathbb{Z}_7) : S_4), 82575360, \mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2)$
QSRD(28,2,1,0,2,1,0)		2	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2), (2)$
QSRD(28,2,0,0,2,1,0)		9	$\mathbb{Z}_7 \times ((\mathbb{Z}_7 \times \mathbb{Z}_7 \times \mathbb{Z}_7) : S_4), \mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2), (6), (\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_4 \times D_7, (6)$
QSRD(28,2,1,0,1,0)		1	$\mathbb{Z}_7^2 : D_4$
QSRD(28,2,0,0,2,0)		2	1605632, 229376
QSRD(28,2,0,0,1,0)		1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7)$
QSRD(28,3,1,0,3,2,1,0)		2	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2), (2)$
QSRD(28,3,0,1,2,0)		1	4667544
QSRD(28,3,1,0,2,1,0)		7	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2), (4), \mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2), \mathbb{Z}_2 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7), \mathbb{Z}_7^2 : D_4$
QSRD(28,3,1,0,2,0)		2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7), (2)$
QSRD(28,3,2,1,1,0)		1	$\mathbb{Z}_7^2 : D_4$
QSRD(28,3,2,0,1,0)		1	$\mathbb{Z}_7^2 : D_4$
QSRD(28,3,2,0,2,1,0)		8	$\mathbb{Z}_7^2 : D_4, \mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2), (5), (5), (5), \mathbb{Z}_4 \times D_7, (2)$
QSRD(28,3,0,0,2,1,0)		11	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2), (5),$ $\mathbb{Z}_4 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7), (2), (\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4, (5),$ $\mathbb{Z}_7^2 : (\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)),$ $\mathbb{Z}_4 \times (\mathbb{Z}_7 : \mathbb{Z}_3), (\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_3$
QSRD(28,3,0,0,3,2,1,0)		5	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2), (3), (3), \mathbb{Z}_4 \times D_7, (2), (3)$
QSRD(28,3,2,0,3,1,0)		1	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4$
QSRD(28,3,0,0,3,1,0)		1	$PSL(3,2) : \mathbb{Z}_4$
QSRD(28,3,2,0,3,2,1,0)		1	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2)$
QSRD(28,3,0,0,3,2,0)		1	$\mathbb{Z}_7 \times S_4$
QSRD(28,4,1,0,4,3,2,1,0)		2	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2), (2)$
QSRD(28,4,3,0,3,2,1,0)		3	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2), (2), \mathbb{Z}_7^2 : D_4$
QSRD(28,4,3,0,4,3,2,1,0)		2	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2), (2)$
QSRD(28,4,2,0,4,2,0)		2	229376, (2)
QSRD(28,4,1,0,2,1,0)		3	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_3), \mathbb{Z}_4 \times (\mathbb{Z}_7 : \mathbb{Z}_3), \mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_6)$
QSRD(28,4,1,0,3,2,0)		1	$\mathbb{Z}_7^2 : (\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2))$
QSRD(28,4,2,0,2,0)		3	229376, $(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2)$
QSRD(28,4,2,1,2,1,0)		1	$\mathbb{Z}_7^2 : D_4$
QSRD(28,4,2,0,2,1,0)		5	$\mathbb{Z}_7^2 : D_4, (\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2), \mathbb{Z}_4 \times D_7, (2)$
QSRD(28,4,0,0,4,2,0)		8	1605632, 229376, (6), $PSL(3,2) : \mathbb{Z}_4$
QSRD(28,4,0,0,2,1,0)		5	$\mathbb{Z}_2^3 : \mathbb{Z}_7, (2), \mathbb{Z}_4 \times (\mathbb{Z}_7 : \mathbb{Z}_3), (2), \mathbb{Z}_7 : \mathbb{Z}_{12}$
QSRD(28,4,2,0,4,2,1,0)		6	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2), (2), \mathbb{Z}_4 \times D_7, (3), (\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, (3)$
QSRD(28,4,0,0,4,2,1,0)		3	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4, (\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_4 \times D_7$
QSRD(28,4,0,0,4,0)		1	32105299968
QSRD(28,4,0,0,4,1,0)		1	$PSL(3,2) : \mathbb{Z}_4$
QSRD(28,4,0,0,4,3,2,1,0)		2	$\mathbb{Z}_4 \times D_7, (\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2$
QSRD(28,4,0,0,3,2,1,0)		5	$\mathbb{Z}_4 \times (\mathbb{Z}_7 : \mathbb{Z}_3), \mathbb{Z}_7 \times S_4, (4)$
QSRD(28,4,2,0,4,3,2,1,0)		1	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2)$
QSRD(28,4,2,0,3,2,1,0)		1	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2)$
QSRD(28,5,3,2,4,2,0)		2	229376, (2)
QSRD(28,5,3,2,2,0)		1	229376
QSRD(28,5,3,2,4,1,0)		1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7)$
QSRD(28,5,3,0,2,1,0)		2	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2), (2)$
QSRD(28,5,1,0,4,2,0)		6	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7), (6)$
QSRD(28,5,3,0,3,2,1,0)		2	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2), (2)$
QSRD(28,5,2,0,2,1,0)		2	$(\mathbb{Z}_7 : \mathbb{Z}_3) \times D_4, \mathbb{Z}_7 : (\mathbb{Z}_3 \times D_4)$
QSRD(28,5,2,0,3,2,0)		2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_3), \mathbb{Z}_4 \times (\mathbb{Z}_7 : \mathbb{Z}_3)$
QSRD(28,5,3,0,5,4,3,0)		2	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2), (2)$
QSRD(28,5,1,0,4,2,1,0)		1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2)$
QSRD(28,5,2,0,3,2,1,0)		8	$\mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_6), (\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4, (4), (4), \mathbb{Z}_4 \times D_7, (2), \mathbb{Z}_7 \times S_4$
QSRD(28,5,3,2,2,1,0)		1	$\mathbb{Z}_7^2 : D_4$
QSRD(28,5,4,0,5,2,0)		2	$\mathbb{Z}_4 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2), (2)$
QSRD(28,5,0,0,4,2,1,0)	9	$\mathbb{Z}_4 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7), (6), (\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4, (6), \mathbb{Z}_7 \times S_4, (2)$	

Tablica 4.37: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n \in \{27, 28\}$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
28	QSRD(28, 5, 4, 0; 5, 3, 1, 0)	1	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4$
	QSRD(28, 5, 4, 0; 5, 2, 1, 0)	1	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4$
	QSRD(28, 5, 0, 0; 5, 4, 3, 0)	1	$\mathbb{Z}_4 \times D_7$
	QSRD(28, 5, 0, 0; 5, 3, 2, 1, 0)	1	$\mathbb{Z}_4 \times D_7$
	QSRD(28, 5, 0, 0; 5, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_4 \times D_7$
	QSRD(28, 5, 0, 0; 5, 2, 1, 0)	2	$\mathbb{Z}_4 \times D_7, \mathbb{Z}_7 \times S_4$
	QSRD(28, 5, 2, 0; 4, 3, 2, 1, 0)	2	$\mathbb{Z}_4 \times D_7, (2)$
	QSRD(28, 5, 2, 0; 5, 2, 1, 0)	1	$\mathbb{Z}_7 : \mathbb{Z}_{12}$
	QSRD(28, 5, 4, 0; 5, 4, 3, 0)	1	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(28, 5, 2, 0; 4, 2, 1, 0)	1	$\mathbb{Z}_7 \times S_4$
	QSRD(28, 5, 0, 0; 3, 2, 1, 0)	1	$\mathbb{Z}_7 \times S_4$
	QSRD(28, 5, 4, 0; 2, 1, 0)	1	$\mathbb{Z}_4 \times D_7$
	QSRD(28, 5, 4, 0; 3, 2, 1, 0)	1	$\mathbb{Z}_4 \times D_7$
	QSRD(28, 6, 3, 2; 4, 1, 0)	2	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2), (2)$
	QSRD(28, 6, 2, 2; 6, 2, 1, 0)	1	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4$
	QSRD(28, 6, 4, 2; 4, 2, 0)	3	229376, $(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2)$
	QSRD(28, 6, 2, 0; 6, 4, 2, 0)	2	229376, (2)
	QSRD(28, 6, 4, 0; 4, 2, 0)	7	229376, (7)
	QSRD(28, 6, 2, 0; 4, 2, 0)	5	229376, (5)
	QSRD(28, 6, 5, 0; 6, 5, 0)	1	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(28, 6, 3, 2; 3, 0)	3	$\mathbb{Z}_7^2 : D_4, \mathbb{Z}_7^2 : (\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)), (2)$
	QSRD(28, 6, 0, 2; 4, 0)	1	14450688
	QSRD(28, 6, 0, 0; 4, 2, 0)	6	229376, (5), 688128
	QSRD(28, 6, 0, 0; 6, 4, 2, 0)	3	229376, (3)
	QSRD(28, 6, 0, 1; 3, 1, 0)	4	$\mathbb{Z}_2^3 : (\mathbb{Z}_7 : \mathbb{Z}_3), (4)$
	QSRD(28, 6, 4, 2; 6, 3, 2, 0)	1	$\mathbb{Z}_7 \times ((\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2)$
	QSRD(28, 6, 0, 0; 4, 1, 0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7), (2)$
	QSRD(28, 6, 4, 0; 6, 4, 2, 0)	1	229376
	QSRD(28, 6, 4, 0; 6, 4, 2, 1, 0)	2	$\mathbb{Z}_4 \times D_7, (\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(28, 6, 4, 0; 6, 3, 2, 0)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_4 \times D_7$
	QSRD(28, 6, 4, 0; 4, 1, 0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7)$
	QSRD(28, 6, 3, 0; 3, 2, 0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_6), (2)$
	QSRD(28, 6, 0, 0; 6, 5, 0)	1	$\mathbb{Z}_4 \times S_7$
	QSRD(28, 6, 0, 0; 6, 5, 4, 3, 2, 1, 0)	1	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(28, 6, 0, 0; 6, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_4 \times D_7$
	QSRD(28, 6, 2, 0; 6, 4, 3, 2, 0)	2	$\mathbb{Z}_4 \times D_7, (\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(28, 6, 2, 0; 6, 4, 3, 2, 1, 0)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_4 \times D_7$
	QSRD(28, 6, 0, 0; 6, 3, 2, 0)	1	$\mathbb{Z}_7 : (\mathbb{Z}_3 \times D_4)$
	QSRD(28, 6, 4, 0; 6, 2, 1, 0)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_4 \times D_7$
	QSRD(28, 6, 4, 0; 4, 2, 1, 0)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2)$
	QSRD(28, 6, 4, 0; 4, 3, 2, 1, 0)	6	$\mathbb{Z}_4 \times D_7, (4), (\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2)$
	QSRD(28, 6, 4, 0; 6, 4, 3, 2, 0)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_4 \times D_7$
	QSRD(28, 6, 0, 1; 3, 2, 1, 0)	1	$PSL(3, 2)$
	QSRD(28, 6, 0, 0; 6, 4, 3, 2, 0)	1	$\mathbb{Z}_7 \times S_4$
	QSRD(28, 7, 3, 2; 4, 2, 0)	5	229376, (5)
	QSRD(28, 7, 5, 4; 2, 0)	1	229376
	QSRD(28, 7, 3, 2; 6, 4, 2, 0)	2	229376, (2)
	QSRD(28, 7, 3, 2; 4, 2, 1, 0)	2	$\mathbb{Z}_2^3 : \mathbb{Z}_7, (2)$
	QSRD(28, 7, 1, 0; 6, 4, 2, 0)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7), (2)$
	QSRD(28, 7, 3, 0; 4, 3, 2, 1, 0)	2	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2), (2)$
	QSRD(28, 7, 5, 0; 5, 4, 3, 2, 1, 0)	2	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2), (2)$
	QSRD(28, 7, 1, 0; 4, 0)	1	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^6 : (\mathbb{Z}_7 : \mathbb{Z}_3))$
	QSRD(28, 7, 5, 0; 6, 4, 2, 0)	3	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7), (3)$
	QSRD(28, 7, 5, 0; 4, 2, 0)	1	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7)$
	QSRD(28, 7, 5, 0; 4, 3, 2, 0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2)$
	QSRD(28, 7, 1, 0; 6, 5, 4, 3, 2, 0)	1	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_3)$
	QSRD(28, 7, 4, 0; 4, 3, 0)	4	$\mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_6), (4)$
	QSRD(28, 7, 4, 3; 4, 0)	3	$\mathbb{Z}_7^2 : D_4, \mathbb{Z}_7^2 : (\mathbb{Z}_3 \times ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)), (2)$
	QSRD(28, 7, 4, 0; 7, 4, 3, 2, 0)	4	$\mathbb{Z}_4 \times D_7, (4)$
	QSRD(28, 7, 6, 0; 5, 4, 3, 2, 0)	2	$\mathbb{Z}_4 \times D_7, (2)$
	QSRD(28, 7, 6, 0; 7, 3, 0)	1	$((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4) : \mathbb{Z}_3$
	QSRD(28, 7, 0, 0; 4, 1, 0)	1	$\mathbb{Z}_4 \times (\mathbb{Z}_2^6 : (\mathbb{Z}_7 : \mathbb{Z}_3))$
	QSRD(28, 7, 4, 0; 6, 5, 4, 2, 0)	3	$\mathbb{Z}_4 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7), (3)$
	QSRD(28, 7, 0, 0; 6, 4, 2, 1, 0)	2	$\mathbb{Z}_4 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7), (2)$
	QSRD(28, 7, 2, 0; 4, 3, 2, 1, 0)	2	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4, (2)$
	QSRD(28, 7, 4, 0; 5, 4, 2, 0)	1	$\mathbb{Z}_4 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7)$
	QSRD(28, 7, 4, 0; 5, 4, 3, 2, 1, 0)	2	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4, (2)$
	QSRD(28, 7, 4, 0; 5, 4, 3, 2, 0)	1	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4$
	QSRD(28, 7, 6, 0; 7, 6, 4, 3, 2, 0)	1	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4$
	QSRD(28, 7, 6, 0; 7, 4, 2, 1, 0)	1	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4$
	QSRD(28, 7, 0, 0; 7, 0)	1	2580965130240000
	QSRD(28, 7, 6, 0; 7, 5, 3, 1, 0)	1	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4$

Tablica 4.38: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 28$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
28	QSRD(28, 7, 6, 0; 7, 4, 3, 2, 0)	2	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4, (2)$
	QSRD(28, 7, 6, 0; 7, 4, 3, 2, 0)	2	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4, (2)$
	QSRD(28, 7, 0, 0; 7, 5, 2, 0)	1	$\mathbb{Z}_4 \times S_7$
	QSRD(28, 7, 0, 0; 7, 5, 4, 3, 2, 0)	1	$\mathbb{Z}_4 \times D_7$
	QSRD(28, 7, 0, 0; 7, 6, 5, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_4 \times D_7$
	QSRD(28, 7, 0, 0; 7, 4, 3, 0)	1	$PSL(3, 2) : \mathbb{Z}_4$
	QSRD(28, 7, 6, 0; 5, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_4 \times (\mathbb{Z}_7 : \mathbb{Z}_3)$
	QSRD(28, 7, 4, 0; 7, 4, 2, 1, 0)	2	$\mathbb{Z}_4 \times D_7, (2)$
	QSRD(28, 7, 0, 0; 6, 4, 3, 2, 0)	2	$\mathbb{Z}_7 \times S_4, (2)$
	QSRD(28, 7, 6, 0; 6, 4, 3, 2, 0)	1	$\mathbb{Z}_7 \times S_4$
	QSRD(28, 7, 6, 0; 5, 2, 1, 0)	1	$\mathbb{Z}_4 \times S_7$
	QSRD(28, 7, 6, 0; 4, 3, 2, 1, 0)	1	$\mathbb{Z}_7 \times S_4$
	QSRD(28, 4, 2; 4, 2, 0)	1	229376
	QSRD(28, 2, 0; 8, 6, 4, 2, 0)	2	229376, (2)
	QSRD(28, 4, 0; 4, 2)	1	229376
	QSRD(28, 6, 0; 6, 4, 2, 0)	3	229376, (3)
	QSRD(28, 2, 0; 6, 4, 2, 0)	1	688128
	QSRD(28, 6, 0; 8, 6, 4, 2, 0)	2	229376, (2)
	QSRD(28, 2, 0; 8, 5, 4, 0)	1	$\mathbb{Z}_7 : (\mathbb{Z}_3 \times D_4)$
	QSRD(28, 5, 0; 5, 4, 0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_6), (2)$
	QSRD(28, 0, 0; 8, 4, 0)	1	32105299968
	QSRD(28, 4, 0; 8, 4, 2, 0)	2	229376, (2)
	QSRD(28, 4, 0; 6, 4, 2, 0)	1	229376
	QSRD(28, 4, 0; 8, 6, 4, 2, 0)	1	229376
	QSRD(28, 4, 0; 8, 6, 5, 4, 2, 0)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_4 \times D_7$
	QSRD(28, 4, 0; 8, 6, 5, 4, 3, 0)	2	$\mathbb{Z}_4 \times D_7, (\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(28, 6, 0; 8, 5, 4, 0)	2	$\mathbb{Z}_4 \times D_7, (\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(28, 6, 0; 8, 6, 4, 3, 2, 0)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_4 \times D_7$
	QSRD(28, 7, 0; 8, 7, 2, 0)	1	$\mathbb{Z}_{14} \times D_7$
	QSRD(28, 2, 2; 6, 5, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_4 \times D_7$
	QSRD(28, 4, 2; 6, 4, 2, 0)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2)$
	QSRD(28, 6, 2; 6, 4, 3, 2, 0)	2	$\mathbb{Z}_4 \times D_7, (\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(28, 2, 2; 6, 4, 3, 2, 1, 0)	1	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(28, 4, 2; 6, 4, 3, 2, 0)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2)$
	QSRD(28, 2, 0; 8, 7, 2, 0)	1	$\mathbb{Z}_4 \times S_7$
	QSRD(28, 2, 0; 8, 7, 6, 5, 4, 3, 2, 0)	1	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(28, 2, 0; 8, 6, 5, 4, 3, 0)	1	$\mathbb{Z}_4 \times D_7$
	QSRD(28, 6, 0; 8, 6, 4, 2, 1, 0)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_4 \times D_7$
	QSRD(28, 6, 0; 6, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_7 \times S_4$
	QSRD(28, 9, 5, 4; 4, 2, 0)	1	229376
	QSRD(28, 9, 3, 2; 8, 6, 4, 2, 0)	2	229376, (2)
	QSRD(28, 9, 3, 2; 6, 4, 0)	1	688128
	QSRD(28, 9, 5, 0; 8, 6, 4, 0)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7), (2)$
	QSRD(28, 9, 8, 0; 9, 8, 7, 4, 0)	1	$\mathbb{Z}_{14} \times D_7$
	QSRD(28, 9, 5, 2; 6, 4, 2)	1	$\mathbb{Z}_2^3 : \mathbb{Z}_7$
	QSRD(28, 9, 6, 2; 6, 4, 3, 2)	2	$\mathbb{Z}_7 : (\mathbb{Z}_3 \times D_4), (2)$
	QSRD(28, 9, 0, 2; 6, 4, 3, 0)	1	$S_4 \times (\mathbb{Z}_7 : \mathbb{Z}_3)$
	QSRD(28, 9, 8, 0; 9, 6, 4, 0)	1	$\mathbb{Z}_4 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2)$
	QSRD(28, 9, 4, 0; 9, 8, 7, 4, 0)	1	$\mathbb{Z}_4 \times D_7$
	QSRD(28, 9, 4, 0; 9, 7, 6, 5, 4, 0)	1	$\mathbb{Z}_4 \times D_7$
	QSRD(28, 9, 6, 0; 9, 6, 5, 0)	1	$\mathbb{Z}_7 : \mathbb{Z}_{12}$
	QSRD(28, 9, 6, 0; 7, 6, 4, 0)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_3), \mathbb{Z}_4 \times (\mathbb{Z}_7 : \mathbb{Z}_3)$
	QSRD(28, 9, 6, 0; 7, 6, 5, 0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_6)$
	QSRD(28, 9, 4, 0; 9, 8, 7, 6, 5, 4, 0)	1	$\mathbb{Z}_4 \times D_7$
	QSRD(28, 9, 4, 0; 9, 6, 5, 0)	1	$\mathbb{Z}_4 \times D_7$
	QSRD(28, 9, 8, 0; 9, 6, 4, 2, 0)	1	$\mathbb{Z}_4 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2)$
	QSRD(28, 9, 6, 3; 4, 3, 2, 0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_6)$
	QSRD(28, 9, 4, 0; 8, 6, 5, 4, 0)	2	$\mathbb{Z}_4 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7), (2)$
	QSRD(28, 9, 8, 0; 9, 8, 6, 5, 4, 2, 1, 0)	1	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4$
	QSRD(28, 9, 7, 0; 9, 8, 7, 4, 0)	2	$\mathbb{Z}_{14} \times D_7, (2)$
	QSRD(28, 9, 8, 0; 9, 7, 5, 4, 0)	1	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4$
	QSRD(28, 9, 8, 0; 9, 6, 5, 0)	1	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4$
	QSRD(28, 9, 0, 2; 6, 5, 4, 2, 0)	1	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_3$
	QSRD(28, 10, 6, 4; 6, 4, 2)	1	229376
	QSRD(28, 10, 4, 3; 5, 4, 3, 0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_6), (2)$
	QSRD(28, 10, 6, 0; 10, 8, 6, 0)	3	229376, (2), $PSL(3, 2) : \mathbb{Z}_4$
	QSRD(28, 10, 8, 0; 10, 9, 8, 7, 6, 0)	1	$\mathbb{Z}_{14} \times D_7$
	QSRD(28, 10, 8, 0; 9, 8, 7, 6, 0)	1	$\mathbb{Z}_{14} \times D_7$
	QSRD(28, 10, 7, 0; 8, 7, 6, 0)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_3), \mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_6)$
	QSRD(28, 10, 7, 0; 9, 8, 6, 0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_7^2 : (\mathbb{Z}_3 \times S_3))$
	QSRD(28, 10, 8, 0; 10, 8, 6, 0)	1	229376
	QSRD(28, 10, 8, 0; 10, 8, 7, 6, 0)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_4 \times D_7$
	QSRD(28, 10, 6, 0; 10, 9, 8, 7, 6, 0)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_4 \times D_7$
	QSRD(28, 10, 6, 0; 10, 7, 0)	1	$PSL(3, 2) : \mathbb{Z}_4$
	QSRD(28, 10, 6, 0; 8, 7, 6, 0)	1	$\mathbb{Z}_4 \times (\mathbb{Z}_7 : \mathbb{Z}_3)$

Tablica 4.39: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 28$

Stupanj	Parametri	# neizom.	Aut(S) ili Aut(S)
28	QSRD(28, 10, 6, 0; 9, 8, 7, 6, 0)	1	$\mathbb{Z}_4 \times (\mathbb{Z}_7 : \mathbb{Z}_3)$
	QSRD(28, 10, 6, 0; 10, 8, 7, 6, 0)	2	$\mathbb{Z}_4 \times D_7, (\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRD(28, 10, 0, 3; 5, 4, 3)	2	$\mathbb{Z}_7 : \mathbb{Z}_{12}, (2)$
	QSRD(28, 10, 7, 0; 10, 9, 8, 7, 6, 0)	1	$\mathbb{Z}_{14} \times D_7$
	QSRD(28, 10, 9, 0; 10, 9, 8, 7, 6, 0)	1	$\mathbb{Z}_{14} \times D_7$
	QSRD(28, 10, 9, 0; 9, 8, 7, 6, 0)	1	$\mathbb{Z}_{14} \times D_7$
	QSRD(28, 10, 6, 4; 6, 4, 2, 0)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2)$
	QSRD(28, 11, 7, 6; 4, 2)	1	229376
	QSRD(28, 11, 9, 0; 10, 8, 0)	1	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7)$
	QSRD(28, 11, 8, 0; 11, 10, 9, 8, 0)	3	$\mathbb{Z}_{14} \times D_7, \mathbb{Z}_4 \times D_7, (2)$
	QSRD(28, 11, 8, 0; 10, 9, 8, 0)	3	$\mathbb{Z}_2 \times (\mathbb{Z}_7^2 : (\mathbb{Z}_3 \times S_3)), \mathbb{Z}_4 \times (\mathbb{Z}_7 : \mathbb{Z}_3), \mathbb{Z}_4 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7)$
	QSRD(28, 11, 10, 0; 10, 9, 8, 0)	1	$\mathbb{Z}_{14} \times D_7$
	QSRD(28, 11, 10, 0; 11, 10, 9, 8, 0)	1	$\mathbb{Z}_{14} \times D_7$
	QSRD(28, 11, 8, 0; 11, 9, 8, 0)	1	$PSL(3, 2) : \mathbb{Z}_4$
	QSRD(28, 11, 9, 0; 11, 10, 9, 8, 0)	1	$\mathbb{Z}_{14} \times D_7$
	QSRD(28, 11, 9, 0; 10, 9, 8, 0)	1	$\mathbb{Z}_{14} \times D_7$
	QSRD(28, 11, 10, 0; 11, 9, 8, 0)	1	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4$
	QSRD(28, 12, 6, 4; 8, 6, 2, 0)	2	229376, (2)
	QSRD(28, 12, 10, 0; 12, 10, 0)	1	229376
	QSRD(28, 12, 10, 0; 12, 11, 10, 0)	4	$\mathbb{Z}_{14} \times D_7, (2), (\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_4 \times D_7$
	QSRD(28, 12, 0, 4; 8, 0)	1	9631589904
	QSRD(28, 12, 8, 4; 12, 8, 6, 4)	1	229376
	QSRD(28, 12, 10, 4; 12, 6, 5, 4)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_4 \times D_7$
	QSRD(28, 12, 10, 4; 10, 6, 4)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, (2)$
	QSRD(28, 12, 10, 4; 12, 10, 8, 6, 5, 4)	2	$\mathbb{Z}_4 \times D_7, (2)$
	QSRD(28, 12, 8, 4; 12, 10, 5, 4)	1	$(\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_4$
	QSRD(28, 12, 6, 5; 6, 5)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_6)$
	QSRD(28, 12, 11, 0; 12, 11, 10, 0)	1	$\mathbb{Z}_{14} \times D_7$
	QSRD(28, 12, 10, 4; 12, 7, 6, 4)	2	$(\mathbb{Z}_{14} \times \mathbb{Z}_2) : \mathbb{Z}_2, \mathbb{Z}_4 \times D_7$
	QSRD(28, 13, 7, 6; 8, 2, 0)	2	229376, (2)
	QSRD(28, 13, 7, 6; 8, 1)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_2^6 : \mathbb{Z}_7)$
	QSRD(28, 13, 12, 0; 13, 12, 0)	2	$\mathbb{Z}_{14} \times D_7, 1290240$
	SRG(28, 12, 6, 4, 12)	1	S_8
	QSRG(28, 2, 2, 0; 2, 0)	1	10569646080
	QSRG(28, 2, 2, 0; 1, 0)	3	$\mathbb{Z}_7^2 : ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2), 921984, D_{28}$
	QSRG(28, 3, 0; 2, 1, 0)	5	$\mathbb{Z}_7^2 : ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2), (2), \mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2), D_{28}, \mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7$
	QSRG(28, 3, 0; 1, 0)	2	225792, $PSL(3, 2) : \mathbb{Z}_2$
	QSRG(28, 4, 0; 2, 1, 0)	14	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, (2), D_7 \times D_4, (2),$ $\mathbb{Z}_7^2 : ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2), (2),$ $\mathbb{Z}_2 \times (PSL(3, 2) : \mathbb{Z}_2), \mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2), D_{28}$
	QSRG(28, 4, 0; 4, 2, 0)	2	458752, 6422528
	QSRG(28, 4, 0; 1, 0)	1	$\mathbb{Z}_2 \times (PSL(3, 2) : \mathbb{Z}_2)$
	QSRG(28, 4, 0; 3, 2, 1, 0)	2	$\mathbb{Z}_7^2 : ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2), D_{28}$
	QSRG(28, 4, 0; 2, 0)	1	225792
	QSRG(28, 5, 0; 4, 3, 2, 1, 0)	3	$\mathbb{Z}_7^2 : ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2), D_{28}, \mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7$
	QSRG(28, 5, 0; 4, 3, 1, 0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2)$
QSRG(28, 5, 0; 4, 3, 0)	1	$\mathbb{Z}_7^2 : ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2)$	
QSRG(28, 5, 0; 2, 1, 0)	11	$\mathbb{Z}_2 \times (PSL(3, 2) : \mathbb{Z}_2), D_{28}, (5),$ $\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, (3), \mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_6),$ $\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2)$	
QSRG(28, 5, 0; 2, 0)	1	$\mathbb{Z}_2 \times (PSL(3, 2) : \mathbb{Z}_2)$	
QSRG(28, 5, 0; 4, 2, 1, 0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2)$	
QSRG(28, 5, 0; 3, 2, 1, 0)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, D_{28}$	
QSRG(28, 5, 0; 4, 2, 0)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2), (2)$	
QSRG(28, 6, 2; 2, 1, 0)	7	$PSL(3, 2) : \mathbb{Z}_2, \mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2), D_{28}, (4), \mathbb{Z}_7 : (\mathbb{Z}_2 \times A_4), (4)$	
QSRG(28, 6, 0; 6, 4, 2, 0)	2	458752, (2)	
QSRG(28, 6, 0; 4, 3, 2, 1, 0)	11	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, (4), D_{28}, (7)$	
QSRG(28, 6, 0; 4, 3, 2, 0)	7	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, (2), D_{28}, (3), (2), S_4 \times D_7, D_4 \times D_7, (3), (3)$	
QSRG(28, 6, 0; 6, 2, 0)	1	5505024	
QSRG(28, 6, 0; 3, 2, 1, 0)	4	$D_7 \times D_4, D_{28}, (3)$	
QSRG(28, 6, 0; 2, 1, 0)	4	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, D_7 \times D_4, D_{28}, (2)$	
QSRG(28, 6, 2; 4, 3, 2, 0)	2	$\mathbb{Z}_7^2 : ((\mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2) : \mathbb{Z}_2), (2)$	
QSRG(28, 6, 0; 5, 0)	1	203212800	
QSRG(28, 6, 2; 4, 2, 1, 0)	2	$D_4 \times D_7, (2)$	
QSRG(28, 6, 0; 4, 2, 1, 0)	6	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, (2), D_{28}, (2), D_4 \times D_7, (2), (2)$	
QSRG(28, 6, 0; 5, 4, 3, 2, 1, 0)	1	D_{28}	
QSRG(28, 6, 2; 3, 2, 1, 0)	1	D_{28}	
QSRG(28, 6, 0; 3, 2, 0)	1	$\mathbb{Z}_7 : (\mathbb{Z}_3 \times D_4)$	
QSRG(28, 6, 1; 2, 1, 0)	1	$PSL(3, 2) : \mathbb{Z}_2$	
QSRG(28, 7, 0; 7, 0)	1	5161930260480000	
QSRG(28, 7, 0; 6, 5, 3, 1, 0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2)$	

Tablica 4.40: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 28$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
28	QSRG(28, 7, 0; 6, 5, 4, 3, 2, 1, 0)	2	$D_{28}, \mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7$
	QSRG(28, 7, 0; 6, 3, 0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2) : \mathbb{Z}_3$
	QSRG(28, 7, 0; 5, 4, 3, 2, 1, 0)	2	$D_{28}, (2)$
	QSRG(28, 7, 0; 6, 4, 3, 2, 0)	3	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2), (3)$
	QSRG(28, 7, 0; 4, 3, 2, 1, 0)	6	$D_{28}, (5), (5), \mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, (5)$
	QSRG(28, 7, 0; 6, 4, 2, 1, 0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2)$
	QSRG(28, 7, 0; 5, 4, 3, 2, 0)	1	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7$
	QSRG(28, 7, 0; 4, 3, 2, 0)	6	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, (6)$
	QSRG(28, 7, 0; 4, 2, 1, 0)	3	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, (2), D_{28}, (2)$
	QSRG(28, 7, 0; 5, 2, 0)	1	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times S_7$
	QSRG(28, 7, 0; 3, 2, 0)	1	$\mathbb{Z}_7 : (\mathbb{Z}_3 \times D_4)$
	QSRG(28, 7, 0; 4, 3, 0)	1	$\mathbb{Z}_2 \times (PSL(3, 2) : \mathbb{Z}_2)$
	QSRG(28, 8, 0; 7, 2, 0)	1	101606400
	QSRG(28, 8, 0; 8, 6, 4, 2, 0)	1	458752
	QSRG(28, 8, 0; 8, 4, 0)	2	5505024, 64210599936
	QSRG(28, 8, 0; 8, 4, 2, 0)	1	458752
	QSRG(28, 8, 0; 6, 5, 4, 3, 2, 0)	1	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7$
	QSRG(28, 8, 0; 6, 5, 4, 3, 2, 1)	1	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7$
	QSRG(28, 8, 0; 5, 4, 3, 2)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, D_{28}$
	QSRG(28, 8, 0; 6, 5, 4, 0)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, D_{28}$
	QSRG(28, 8, 0; 6, 5, 4, 2, 0)	4	$D_7 \times D_4, (2), D_{28}, \mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7$
	QSRG(28, 8, 0; 6, 4, 3, 2, 0)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, D_{28}$
	QSRG(28, 8, 0; 6, 4, 2, 1, 0)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, D_{28}$
	QSRG(28, 8, 0; 5, 2)	1	$S_7 \times D_4$
	QSRG(28, 8, 0; 4, 3, 2)	1	$\mathbb{Z}_2 \times (PSL(3, 2) : \mathbb{Z}_2)$
	QSRG(28, 8, 0; 5, 4, 2, 0)	1	$\mathbb{Z}_7 : (\mathbb{Z}_3 \times D_4)$
	QSRG(28, 8, 0; 6, 5, 4, 3, 0)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, D_{28}$
	QSRG(28, 8, 0; 5, 4, 2, 1)	2	$D_7 \times D_4, D_{28}$
	QSRG(28, 8, 0; 4, 3, 2, 1)	1	$S_4 \times D_7$
	QSRG(28, 8, 0; 6, 5, 4, 3, 2, 1, 0)	1	D_{28}
	QSRG(28, 8, 0; 5, 4, 3, 2, 1, 0)	1	D_{28}
	QSRG(28, 8, 0; 6, 4, 3, 2, 1)	1	D_{28}
	QSRG(28, 8, 0; 7, 6, 5, 4, 3, 2, 0)	1	D_{28}
	QSRG(28, 9, 2; 4, 3, 2)	2	$\mathbb{Z}_7 : (\mathbb{Z}_2 \times A_4), D_{28}$
	QSRG(28, 9, 0; 8, 7, 5, 4, 0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2)$
	QSRG(28, 9, 0; 8, 6, 5, 0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2)$
	QSRG(28, 9, 0; 8, 6, 5, 4, 2, 1, 0)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2)$
	QSRG(28, 9, 0; 8, 7, 6, 5, 4, 3, 2, 1, 0)	1	D_{28}
	QSRG(28, 9, 0; 7, 6, 5, 4, 3, 2, 1)	1	D_{28}
	QSRG(28, 9, 0; 8, 7, 4, 0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_7^2 : D_4)$
	QSRG(28, 9, 0; 8, 6, 4, 0)	1	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2)$
	QSRG(28, 9, 2; 4, 2)	1	$PSL(2, 8)$
	QSRG(28, 9, 0; 8, 7, 6, 5, 4, 0)	1	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7$
	QSRG(28, 9, 0; 7, 6, 5, 4, 0)	1	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7$
	QSRG(28, 9, 0; 6, 5, 4, 0)	1	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7$
	QSRG(28, 9, 0; 8, 6, 4, 2, 0)	1	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2)$
	QSRG(28, 9, 0; 6, 4, 0)	1	$\mathbb{Z}_2 \times (PSL(3, 2) : \mathbb{Z}_2)$
	QSRG(28, 9, 0; 6, 5, 0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_7 : \mathbb{Z}_6)$
	QSRG(28, 10, 0; 7, 6, 0)	1	$\mathbb{Z}_2 \times (PSL(3, 2) : \mathbb{Z}_2)$
	QSRG(28, 10, 0; 10, 8, 6, 0)	1	458752
	QSRG(28, 10, 0; 9, 8, 7, 6, 0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_7^2 : D_4), D_{28}$
	QSRG(28, 10, 0; 10, 8, 6, 4, 2)	1	458752
	QSRG(28, 10, 0; 8, 6, 0)	1	$(PSL(3, 2) \times PSL(3, 2)) : \mathbb{Z}_2^2$
	QSRG(28, 10, 0; 8, 7, 6, 0)	5	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, (2), \mathbb{Z}_2 \times (PSL(3, 2) : \mathbb{Z}_2), D_{28}, (2)$
	QSRG(28, 11, 0; 9, 8, 0)	1	$(PSL(3, 2) \times PSL(3, 2)) : \mathbb{Z}_2^2$
	QSRG(28, 11, 0; 10, 9, 8, 0)	3	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2), \mathbb{Z}_2 \times (\mathbb{Z}_7^2 : D_4), \mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7$
	QSRG(28, 12, 4; 6, 4)	1	$\mathbb{Z}_2^3 : PSL(3, 2)$
	QSRG(28, 12, 4; 12, 8, 6, 4)	2	458752, (2)
	QSRG(28, 12, 4; 10, 7, 6, 4)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, D_{28}$
	QSRG(28, 12, 4; 10, 6, 5, 4)	2	$\mathbb{Z}_2 \times \mathbb{Z}_2 \times D_7, D_{28}$
	QSRG(28, 12, 0; 12, 10, 0)	1	165150720
	QSRG(28, 12, 0; 11, 10, 0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_7^2 : D_4), D_{28}$
	QSRG(28, 12, 10; 12, 0)	1	832359628800
	QSRG(28, 12, 4; 10, 8, 6, 5, 4)	2	$D_{28}, (2)$
	QSRG(28, 12, 4; 10, 8, 5, 4)	1	$\mathbb{Z}_2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_7) : \mathbb{Z}_2)$
	QSRG(28, 13, 0; 12, 0)	1	174356582400
	QSRG(28, 13, 6; 6, 0)	1	$\mathbb{Z}_2 \times PSL(2, 13)$
QSRG(28, 18, 10; 15, 12)	1	$S_7 \times S_4$	

Tablica 4.41: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 28$

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
29	QSRD(29,7,0,2;3,2,0)	1	$\mathbb{Z}_{29} : \mathbb{Z}_7$
	SRG(29,14,6,7)	1	$\mathbb{Z}_{29} : \mathbb{Z}_{14}$
	QSRG(29,2,0;1,0)	1	D_{29}
	QSRG(29,4,0;2,1,0)	5	$D_{29} (4), \mathbb{Z}_{29} : \mathbb{Z}_4$
	QSRG(29,4,0;3,2,1,0)	1	D_{29}
	QSRG(29,6,0;4,3,2,1,0)	6	D_{29}
	QSRG(29,6,2;3,2,1,0)	1	D_{29}
	QSRG(29,6,2;2,1,0)	2	D_{29}
	QSRG(29,6,0;3,2,1,0)	1	D_{29}
	QSRG(29,6,0;5,4,3,2,1,0)	1	D_{29}
	QSRG(29,6,0;2,1,0)	1	D_{29}
	QSRG(29,8,0;5,4,3,2,1,0)	2	D_{29}
	QSRG(29,8,0;5,4,2,1,0)	1	D_{29}
	QSRG(29,8,0;6,4,3,2,1,0)	1	D_{29}
	QSRG(29,8,0;6,4,3,2,1)	1	D_{29}
	QSRG(29,8,0;6,5,4,3,2,1,0)	1	D_{29}
	QSRG(29,8,0;4,3,2)	1	$\mathbb{Z}_{29} : \mathbb{Z}_4$
QSRG(29,8,0;7,6,5,4,3,2,1,0)	1	D_{29}	
QSRG(29,10,0;9,8,7,6,4,3,2,1)	1	D_{29}	
30	DSRG(30,10,0,5,5)	1	17915904000000
	DSRG(30,12,3,6,6)	2	1209323520, (2)
	DSRG(30,13,5,6,8)	4	$\mathbb{Z}_{15} : \mathbb{Z}_4, (2), \mathbb{Z}_5^3 : (A_4 : \mathbb{Z}_4), (2)$
	DSRG(30,14,6,7,7)	10	$\mathbb{Z}_{15} : \mathbb{Z}_4, (4), \mathbb{Z}_5^3 : (A_4 : \mathbb{Z}_4), (4), \mathbb{Z}_5^5 : (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	DSRG(30,14,8,5,9)	1	17915904000000
	DSRG(30,14,7,6,8)	2	1209323520, (2)
	QSRD(30,1,0,0;1,0)	2	214277011200, 933120
	QSRD(30,2,1,0;2,1,0)	2	933120, (2)
	QSRD(30,2,1,0;1,0)	1	933120
	QSRD(30,2,0,0;2,1,0)	2	$\mathbb{Z}_6 \times D_5, \mathbb{Z}_3 \times (\mathbb{Z}_3 : ((\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4))$
	QSRD(30,2,0,0;1,0)	2	$\mathbb{Z}_5^3 : (\mathbb{Z}_4 \times (((\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_3) : \mathbb{Z}_2)), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,2,0,0;2,0)	1	955514880
	QSRD(30,3,1,0;2,1,0)	4	$\mathbb{Z}_6 \times D_5, (2), \mathbb{Z}_{15} : \mathbb{Z}_4, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(30,3,1,0;1,0)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,3,1,0;2,0)	1	$\mathbb{Z}_5^3 : (\mathbb{Z}_4 \times (((\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_3) : \mathbb{Z}_2))$
	QSRD(30,3,2,1;2,0)	1	933120
	QSRD(30,3,0,0;2,1,0)	7	$\mathbb{Z}_6 \times D_5, (2), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (5)$
	QSRD(30,3,0,0;3,2,1,0)	4	$\mathbb{Z}_6 \times D_5, (3), \mathbb{Z}_3 \times (\mathbb{Z}_3 : ((\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4)), (3)$
	QSRD(30,3,0,0;3,1,0)	1	$\mathbb{Z}_3 \times S_5$
	QSRD(30,3,0,0;1,0)	3	$\mathbb{Z}_{15} : \mathbb{Z}_4, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(30,3,2,0;2,1,0)	4	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : ((\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4)), \mathbb{Z}_6 \times D_5, (3)$
	QSRD(30,3,2,0;1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,4,1,0;4,2,1,0)	2	$\mathbb{Z}_6 \times D_5, (2)$
	QSRD(30,4,2,0;3,1,0)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,4,1,0;4,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,4,1,0;3,2,1,0)	7	$\mathbb{Z}_6 \times D_5, (4), \mathbb{Z}_{15} : \mathbb{Z}_4, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(30,4,1,0;1,0)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4, (2)$
	QSRD(30,4,1,0;2,1,0)	7	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (6), \mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,4,2,0;1,0)	1	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30,4,2,0;2,1,0)	7	$\mathbb{Z}_{15} : \mathbb{Z}_4, \mathbb{Z}_6 \times D_5, (2), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2), \mathbb{Z}_2 \times A_4 \times D_5, (2)$
	QSRD(30,4,3,0;2,1,0)	7	$\mathbb{Z}_6 \times D_5, (4), \mathbb{Z}_{15} : \mathbb{Z}_4, \mathbb{Z}_3 \times S_5, (4), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (4), (4)$
	QSRD(30,4,0,0;4,2,0)	1	983040
	QSRD(30,4,0,0;2,1,0)	11	$\mathbb{Z}_{15} : \mathbb{Z}_4, (2), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (7), \mathbb{Z}_2 \times (\mathbb{Z}_{15} : \mathbb{Z}_4), (\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3, (7)$
	QSRD(30,4,0,1;2,0)	1	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_5 \times \mathbb{Z}_5) : ((\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_2))$
	QSRD(30,4,2,0;3,2,1,0)	2	$\mathbb{Z}_6 \times D_5, (2)$
	QSRD(30,4,2,0;4,2,1,0)	4	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : ((\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4)), \mathbb{Z}_6 \times D_5, (3)$
	QSRD(30,4,0,0;4,2,1,0)	5	$\mathbb{Z}_6 \times D_5, (4), \mathbb{Z}_3 \times S_5, (4)$
	QSRD(30,4,0,0;4,3,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_3 : ((A_5 \times A_5) : D_4)), \mathbb{Z}_6 \times S_5$
	QSRD(30,4,2,1;2,0)	2	$\mathbb{Z}_5^3 : (\mathbb{Z}_4 \times (((\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_3) : \mathbb{Z}_2)), (2)$
	QSRD(30,4,0,0;4,1,0)	1	$\mathbb{Z}_3 \times S_5$
	QSRD(30,4,0,0;2,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,5,1,0;3,2,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_{15} : \mathbb{Z}_4)$
	QSRD(30,5,1,0;3,2,1,0)	5	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (3), \mathbb{Z}_{15} : \mathbb{Z}_4, (2), (3), (2)$
	QSRD(30,5,3,0;4,2,1,0)	8	$\mathbb{Z}_6 \times D_5, (6), \mathbb{Z}_{15} : \mathbb{Z}_4, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,5,1,0;2,1,0)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4, (2)$
	QSRD(30,5,3,0;5,3,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_{15} : \mathbb{Z}_4)$
	QSRD(30,5,3,0;5,3,2,1,0)	2	$\mathbb{Z}_6 \times D_5, \mathbb{Z}_3 \times D_5 \times S_3$
QSRD(30,5,1,0;4,2,1,0)	2	$\mathbb{Z}_6 \times D_5, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$	
QSRD(30,5,1,0;4,3,2,0)	2	$\mathbb{Z}_6 \times S_5, (2)$	
QSRD(30,5,1,0;4,3,1,0)	1	$S_5 \times S_3$	
QSRD(30,5,3,0;3,2,1,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$	

Tablica 4.42: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n \in \{29, 30\}$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
30	QSRD(30,5,1,0;2,0)	1	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30,5,3,2;3,0)	2	$\mathbb{Z}_5^3 : (\mathbb{Z}_4 \times ((\mathbb{Z}_4 \times \mathbb{Z}_4) : \mathbb{Z}_3) : \mathbb{Z}_2)$
	QSRD(30,5,0,0;5,4,2,0)	2	$\mathbb{Z}_6 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)$
	QSRD(30,5,0,0;3,2,1,0)	6	$\mathbb{Z}_{15} : \mathbb{Z}_4, (2), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (4)$
	QSRD(30,5,0,0;3,2,0)	4	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (4)$
	QSRD(30,5,0,0;4,3,2,1,0)	3	$\mathbb{Z}_6 \times D_5, \mathbb{Z}_6 \times S_5, (2)$
	QSRD(30,5,2,0;3,2,1,0)	4	$\mathbb{Z}_6 \times D_5, (4)$
	QSRD(30,5,2,0;4,3,2,1,0)	7	$\mathbb{Z}_6 \times D_5, (6), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,5,2,0;5,2,1,0)	3	$\mathbb{Z}_6 \times D_5, (2), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(30,5,0,0;4,2,1,0)	2	$\mathbb{Z}_6 \times D_5, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,5,4,0;3,2,1,0)	5	$\mathbb{Z}_6 \times D_5, (2), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2), \mathbb{Z}_6 \times S_5, (2)$
	QSRD(30,5,0,0;5,4,3,2,1,0)	2	$\mathbb{Z}_6 \times D_5, (2)$
	QSRD(30,5,0,0;5,3,2,0)	2	$\mathbb{Z}_6 \times S_5, (2)$
	QSRD(30,5,0,0;5,0)	2	53747712000000, 17915904000000
	QSRD(30,5,4,0;2,1,0)	2	$\mathbb{Z}_3 \times S_5, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,5,0,0;5,2,1,0)	2	$\mathbb{Z}_3 \times S_5, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,5,4,0;3,1,0)	1	$S_5 \times S_3$
	QSRD(30,5,0,0;2,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,5,4,0;4,2,1,0)	2	$\mathbb{Z}_6 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)$
	QSRD(30,6,1,0;4,3,2,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,6,3,0;4,3,2,1,0)	6	$\mathbb{Z}_6 \times D_5, (6)$
	QSRD(30,6,1,0;3,2,1,0)	4	$\mathbb{Z}_{15} : \mathbb{Z}_4, (2), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(30,6,1,0;4,3,2,1,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(30,6,4,0;5,3,2,1,0)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,3,0;5,4,2,1,0)	3	$\mathbb{Z}_6 \times D_5, (2), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(30,6,1,0;6,2,1,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,6,1,0;6,3,2,1,0)	3	$\mathbb{Z}_6 \times S_5, (2), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,2,0;5,3,2,1,0)	3	$S_5 \times S_3, \mathbb{Z}_6 \times S_5, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,5,0;4,3,2,1,0)	3	$\mathbb{Z}_6 \times D_5, (2), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(30,6,3,0;6,3,2,1,0)	1	$\mathbb{Z}_3 \times S_5$
	QSRD(30,6,3,0;6,4,3,2,1,0)	4	$\mathbb{Z}_6 \times D_5, (4)$
	QSRD(30,6,1,0;5,4,3,2,1,0)	2	$\mathbb{Z}_6 \times D_5, (2)$
	QSRD(30,6,1,0;5,3,2,0)	3	$\mathbb{Z}_6 \times S_5, (2), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,1,0;5,1,0)	1	10368000
	QSRD(30,6,1,0;5,2,0)	2	10368000
	QSRD(30,6,5,0;2,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,5,0;3,2,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,2,0;3,1,0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,6,1,0;5,2,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,2,0;4,3,2,1,0)	3	$\mathbb{Z}_2 \times (\mathbb{Z}_{15} : \mathbb{Z}_4), \mathbb{Z}_6 \times D_5, (2)$
	QSRD(30,6,5,0;3,1)	2	$S_5 \times S_3, (2)$
	QSRD(30,6,2,0;3,2,1,0)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,1,0;4,2,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,2,0;4,2,1,0)	5	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3, \mathbb{Z}_2 \times A_4 \times D_5, (2), \mathbb{Z}_6 \times D_5, (2)$
	QSRD(30,6,5,0;5,2,1,0)	2	$\mathbb{Z}_3 \times ((A_5 \times A_5) : D_4), \mathbb{Z}_6 \times S_5$
	QSRD(30,6,5,0;5,1,0)	1	$\mathbb{Z}_3 : ((A_5 \times A_5) : D_4)$
	QSRD(30,6,0,1;4,2,0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,6,0,0;6,4,3,2,0)	3	$\mathbb{Z}_6 \times D_5, (3)$
	QSRD(30,6,0,0;4,2,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,0,0;4,3,2,1,0)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,0,0;6,4,3,0)	1	$\mathbb{Z}_3 \times S_5$
	QSRD(30,6,4,0;3,2,1,0)	4	$\mathbb{Z}_{15} : \mathbb{Z}_4, (\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3, (2), \mathbb{Z}_6 \times D_5$
	QSRD(30,6,0,0;6,4,2,0)	1	983040
	QSRD(30,6,0,0;4,3,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,4,0;4,2,1,0)	5	$\mathbb{Z}_6 \times D_5, (4), \mathbb{Z}_{15} : \mathbb{Z}_4, (4)$
	QSRD(30,6,2,0;6,3,2,1,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,6,4,0;4,3,2,1,0)	5	$\mathbb{Z}_6 \times D_5, (4), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (4)$
	QSRD(30,6,4,0;5,4,3,2,1,0)	2	$\mathbb{Z}_6 \times D_5, (2)$
	QSRD(30,6,2,0;5,4,3,2,1,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,6,2,0;5,2,1,0)	1	$\mathbb{Z}_6 \times S_5$
	QSRD(30,6,2,0;6,4,3,2,1,0)	2	$\mathbb{Z}_6 \times D_5, (2)$
	QSRD(30,6,0,0;6,5,2,0)	2	$\mathbb{Z}_6 \times S_5, \mathbb{Z}_3 \times ((A_5 \times A_5) : D_4)$
	QSRD(30,6,4,0;4,3,2,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,0,0;4,3,2,0)	1	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30,6,4,0;2,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,4,0;4,3,1,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(30,6,2,1;4,2,1,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(30,6,4,1;2,0)	2	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3, (2)$
	QSRD(30,6,2,1;2,1,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(30,6,0,0;6,2,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,0,0;4,3,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,6,0,0;3,0)	1	1209323520
	QSRD(30,6,4,0;4,2,0)	1	983040
	QSRD(30,6,4,0;3,2,0)	1	$\mathbb{Z}_2 \times S_5 \times A_4$
	QSRD(30,7,2,1;4,2,0)	3	$\mathbb{Z}_{15} : \mathbb{Z}_4, (3)$
	QSRD(30,7,3,0;6,5,4,3,2,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,7,3,0;5,4,3,2,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_{15} : \mathbb{Z}_4)$

Tablica 4.43: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja

$n = 30$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
30	QSRD(30,7,5,0;5,4,3,2,0)	2	$\mathbb{Z}_6 \times D_5, (2)$
	QSRD(30,7,3,2;3,2,1,0)	6	$\mathbb{Z}_{15} : \mathbb{Z}_4, (2), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (4)$
	QSRD(30,7,5,0;5,4,2,1,0)	2	$\mathbb{Z}_6 \times D_5, \mathbb{Z}_3 \times ((\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4)$
	QSRD(30,7,5,0;5,2,1,0)	1	$\mathbb{Z}_3 : ((\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4)$
	QSRD(30,7,1,0;6,4,3,2,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,7,1,0;4,3,2,0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,7,3,0;6,4,3,2,1,0)	2	$\mathbb{Z}_6 \times D_5$
	QSRD(30,7,5,0;4,3,2,1,0)	2	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30,7,5,0;7,5,2,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_{15} : \mathbb{Z}_4)$
	QSRD(30,7,5,0;7,5,4,2,1,0)	2	$\mathbb{Z}_6 \times D_5, \mathbb{Z}_3 \times D_5 \times S_3$
	QSRD(30,7,3,0;7,3,2,0)	1	$\mathbb{Z}_3 \times S_5 \times S_3$
	QSRD(30,7,3,0;7,4,3,2,1,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,7,3,0;7,5,3,2,0)	1	$\mathbb{Z}_6 \times S_5$
	QSRD(30,7,5,0;4,3,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,7,1,0;4,2,0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,7,5,0;4,2,0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,7,4,1;4,3,2,1)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,7,3,0;7,3,0)	1	$\mathbb{Z}_3 \times S_5$
	QSRD(30,7,5,0;5,4,3,2,1,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,7,5,0;5,4,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,7,5,0;6,2,0)	1	$\mathbb{Z}_5^3 : (A_4 : \mathbb{Z}_4)$
	QSRD(30,7,1,0;5,4,3,2,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,7,5,0;5,3,2,0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,7,1,0;4,3,0)	1	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30,7,2,1;3,2,0)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4, (2)$
	QSRD(30,7,3,0;4,3,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30,7,1,0;4,0)	1	$\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4))$
	QSRD(30,7,0,0;7,6,5,4,0)	4	$\mathbb{Z}_6 \times D_5, (3)\mathbb{Z}_3 \times ((\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4), (3)$
	QSRD(30,7,0,0;6,5,4,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(30,7,0,0;5,2,1,0)	1	$\mathbb{Z}_5^3 : (A_4 : \mathbb{Z}_4)$
	QSRD(30,7,4,0;3,2,1,0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,7,0,0;7,5,4,0)	1	$\mathbb{Z}_3 \times S_5$
	QSRD(30,7,2,0;6,5,4,3,2,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,7,2,0;7,4,3,2,1,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,7,4,0;6,4,3,2,1,0)	3	$\mathbb{Z}_6 \times D_5, (3)$
	QSRD(30,7,4,0;5,4,2,1,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,7,4,0;5,4,3,2,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,7,2,0;5,4,3,2,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,7,6,0;5,4,3,2,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,7,4,0;5,4,3,2,1,0)	3	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,7,0,0;5,4,1,0)	2	$\mathbb{Z}_5^3 : (\mathbb{Z}_4 \times A_4)$
	QSRD(30,7,2,0;5,4,1,0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times A_4))$
	QSRD(30,7,6,0;7,6,3,2,0)	2	$\mathbb{Z}_6 \times (\mathbb{Z}_3^4 : D_5)$
	QSRD(30,7,6,0;7,6,3,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_3^4 : (\mathbb{Z}_5 : \mathbb{Z}_4))$
	QSRD(30,7,4,0;5,4,3,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,7,4,0;4,3,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,7,4,0;5,4,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,7,0,0;5,4,3,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,7,6,0;4,3,2,1,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,7,0,0;4,1,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5^4 : (\mathbb{Z}_5 : \mathbb{Z}_4))$
	QSRD(30,8,1,2;4,3,2,1,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,8,3,0;8,5,4,3,2,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,8,3,0;7,6,5,4,3,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,8,5,0;6,5,4,3,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,8,5,0;7,5,4,3,2,0)	2	$\mathbb{Z}_6 \times D_5$
	QSRD(30,8,3,2;5,3,2,1,0)	4	$\mathbb{Z}_{15} : \mathbb{Z}_4, (2), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(30,8,4,2;4,3,2,1,0)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,8,3,0;6,5,4,3,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,8,7,0;6,5,4,3,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,8,5,0;6,5,3,2,1,0)	2	$\mathbb{Z}_6 \times D_5, \mathbb{Z}_3 \times ((\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4)$
	QSRD(30,8,5,0;5,3,2,1,0)	1	$\mathbb{Z}_3 : ((\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4)$
	QSRD(30,8,1,0;5,3,2,0)	1	$\mathbb{Z}_5^3 : (A_4 : \mathbb{Z}_4)$
	QSRD(30,8,1,0;6,5,2,0)	2	$\mathbb{Z}_5^3 : (\mathbb{Z}_4 \times A_4)$
	QSRD(30,8,3,0;6,5,2,1,0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times A_4))$
	QSRD(30,8,7,0;8,7,4,3,0)	2	$\mathbb{Z}_6 \times (\mathbb{Z}_3^4 : D_5)$
	QSRD(30,8,7,0;8,7,3,2,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_3^4 : (\mathbb{Z}_5 : \mathbb{Z}_4))$
	QSRD(30,8,5,0;5,4,2,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
QSRD(30,8,2,0;5,4,0)	1	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$	
QSRD(30,8,5,0;6,5,4,1,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$	
QSRD(30,8,2,0;5,3,0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$	
QSRD(30,8,6,0;5,3,0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$	
QSRD(30,8,5,0;6,5,4,3,2,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$	
QSRD(30,8,6,0;6,4,3,0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$	
QSRD(30,8,3,2;6,3,2,1,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$	
QSRD(30,8,3,2;4,3,2,1,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$	
QSRD(30,8,1,0;6,5,4,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$	
QSRD(30,8,1,0;6,5,4,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$	
QSRD(30,8,7,0;6,4,3,2,1,0)	1	$\mathbb{Z}_6 \times D_5$	

Tablica 4.44: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
30	QSRD(30, 8, 5, 0; 6, 5, 2, 1, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 8, 6, 0; 7, 3, 0)	1	$\mathbb{Z}_5^3 : (A_4 : \mathbb{Z}_4)$
	QSRD(30, 8, 4, 2; 4, 3, 2, 0)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 8, 4, 2; 4, 2, 0)	1	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30, 8, 1, 0; 5, 2, 1, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_3^4 : (\mathbb{Z}_5 : \mathbb{Z}_4))$
	QSRD(30, 8, 2, 0; 5, 1, 0)	1	$\mathbb{Z}_3^5 : (\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4))$
	QSRD(30, 8, 0, 2; 4, 0)	1	1966080
	QSRD(30, 8, 4, 2; 4, 3, 2, 1)	2	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3, (2)$
	QSRD(30, 8, 0, 2; 6, 4, 3, 2, 1)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(30, 8, 2, 2; 4, 3, 2, 1)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30, 8, 6, 2; 4, 3, 2, 1, 0)	2	$\mathbb{Z}_6 \times D_5, (2)$
	QSRD(30, 8, 4, 1; 4, 2, 0)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4, (2)$
	QSRD(30, 8, 4, 0; 8, 4, 2, 0)	1	983040
	QSRD(30, 8, 6, 0; 8, 6, 4, 3, 2, 0)	4	$\mathbb{Z}_3 \times D_5 \times S_3, \mathbb{Z}_6 \times D_5, (3)$
	QSRD(30, 8, 0, 1; 4, 2, 0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30, 8, 4, 1; 4, 2)	2	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3, (2)$
	QSRD(30, 8, 0, 0; 8, 6, 0)	1	11796480
	QSRD(30, 8, 4, 0; 4, 3, 0)	1	$S_5 \times S_3$
	QSRD(30, 8, 0, 0; 8, 7, 6, 0)	2	$\mathbb{Z}_6 \times D_5, \mathbb{Z}_3 \times ((\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4)$
	QSRD(30, 8, 0, 0; 7, 6, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 8, 2, 2; 3, 2, 1, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 8, 4, 0; 7, 6, 5, 4, 3, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 8, 4, 0; 6, 5, 4, 3, 0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_{15} : \mathbb{Z}_4)$
	QSRD(30, 8, 6, 0; 8, 6, 5, 3, 2, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 8, 6, 0; 6, 5, 4, 3, 0)	2	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 8, 2, 2; 6, 4, 3, 2, 1, 0)	3	$\mathbb{Z}_6 \times D_5, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (2)$
	QSRD(30, 8, 6, 0; 6, 5, 3, 2, 1, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 8, 4, 0; 7, 5, 4, 3, 2, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 8, 4, 0; 8, 6, 4, 3, 2, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 8, 4, 0; 8, 6, 4, 3, 0)	2	$\mathbb{Z}_6 \times S_5$
	QSRD(30, 8, 6, 0; 5, 4, 1, 0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 8, 4, 0; 5, 4, 0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30, 8, 4, 0; 8, 4, 0)	1	$\mathbb{Z}_3 \times S_5$
	QSRD(30, 8, 6, 0; 6, 5, 2, 1, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 8, 2, 0; 6, 5, 4, 3, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 9, 3, 2; 4, 3, 2)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 9, 5, 0; 9, 6, 5, 4, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 9, 5, 0; 7, 6, 5, 4, 0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_{15} : \mathbb{Z}_4)$
	QSRD(30, 9, 7, 0; 8, 7, 6, 5, 4, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 9, 7, 0; 7, 6, 5, 4, 3, 0)	3	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 9, 5, 0; 7, 6, 5, 4, 3, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 9, 5, 0; 8, 5, 4, 3, 0)	2	$\mathbb{Z}_6 \times S_5, \mathbb{Z}_3 \times ((A_5 \times A_5) : D_4)$
	QSRD(30, 9, 5, 0; 5, 4, 3, 0)	1	$\mathbb{Z}_3 : ((A_5 \times A_5) : D_4)$
	QSRD(30, 9, 7, 0; 7, 6, 5, 3, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 9, 3, 0; 7, 6, 5, 0)	1	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30, 9, 5, 0; 6, 5, 4, 0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), \mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30, 9, 5, 0; 8, 6, 5, 4, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 9, 5, 0; 6, 4, 0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30, 9, 7, 0; 7, 6, 4, 3, 0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 9, 7, 0; 7, 5, 4, 0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30, 9, 3, 0; 7, 6, 4, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 9, 5, 0; 7, 5, 4, 0)	1	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30, 9, 3, 0; 6, 3, 0)	1	1209323520
	QSRD(30, 9, 4, 2; 5, 4, 3, 2, 1)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 9, 0, 2; 7, 5, 4, 3, 2, 1)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 9, 2, 2; 5, 4, 3, 2, 1)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30, 9, 6, 2; 5, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 9, 6, 2; 5, 4, 3, 2, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 9, 2, 2; 5, 4, 3, 2)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 9, 0, 0; 9, 8, 0)	2	$\mathbb{Z}_6 \times (\mathbb{Z}_2^4 : S_5), 10886400$
	QSRD(30, 9, 4, 0; 5, 4, 3, 0)	1	10368000
	QSRD(30, 9, 4, 0; 7, 6, 5, 3, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 9, 6, 0; 8, 7, 5, 4, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 9, 6, 0; 7, 6, 5, 4, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 9, 2, 2; 4, 3, 2)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 9, 2, 2; 9, 4, 3, 2, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 9, 6, 0; 9, 7, 6, 5, 4, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 9, 6, 0; 7, 6, 5, 4, 3, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 9, 8, 0; 8, 5, 4, 3, 0)	1	$\mathbb{Z}_6 \times S_5$
	QSRD(30, 9, 4, 0; 9, 6, 5, 4, 0)	2	$\mathbb{Z}_6 \times S_5, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 9, 8, 0; 7, 6, 5, 4, 0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30, 9, 4, 0; 8, 5, 3, 0)	2	10368000
	QSRD(30, 9, 8, 0; 6, 5, 4, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 9, 4, 0; 6, 5, 4, 0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 9, 4, 0; 7, 5, 4, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30, 9, 4, 0; 8, 6, 5, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$

Tablica 4.45: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja $n = 30$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
30	QSRD(30,10,5,2,5,3,1)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,10,2,2;6,5,4,3,1)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,10,6,2;6,4,3)	2	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30,10,5,0;9,8,7,6,5,0)	2	$\mathbb{Z}_6 \times D_5, \mathbb{Z}_6 \times S_5$
	QSRD(30,10,7,0;10,7,6,5,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,10,7,0;9,8,7,6,5,0)	2	$\mathbb{Z}_6 \times D_5$
	QSRD(30,10,7,0;8,7,6,5,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,10,9,0;8,7,6,5,0)	2	$\mathbb{Z}_6 \times S_5, \mathbb{Z}_6 \times D_5$
	QSRD(30,10,5,0;10,5,0)	2	17915904000000
	QSRD(30,10,9,0;7,6,5,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,10,6,0;8,7,6,0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,10,5,0;7,6,5,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,10,6,0;7,5,0)	1	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30,10,5,0;9,7,6,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,10,5,0;8,7,6,5,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,10,6,0;8,7,6,5,0)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,10,5,0;10,7,6,5,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,10,6,0;8,7,5,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_{15} : \mathbb{Z}_4)$
	QSRD(30,10,4,2;8,6,4,2,0)	1	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,10,6,3;6,4,3,2)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,10,6,3;6,4,2)	2	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30,10,8,0;10,8,5,4,0)	2	$\mathbb{Z}_3 \times D_5 \times S_3, \mathbb{Z}_6 \times D_5$
	QSRD(30,10,0,0;10,0)	1	143354177519616000000
	QSRD(30,10,8,0;9,7,6,5,0)	2	$\mathbb{Z}_6 \times D_5$
	QSRD(30,10,8,0;10,8,7,6,5,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,10,6,0;9,8,7,5,0)	1	$\mathbb{Z}_6 \times S_5$
	QSRD(30,10,6,0;9,7,6,5,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,10,8,0;8,7,6,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30,10,6,3;8,6,4,3,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,11,1,4;6,4,3,2)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,11,5,4;8,6,4,3,2,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,11,7,0;9,8,7,0)	3	$\mathbb{Z}_2 \times (\mathbb{Z}_{15} : \mathbb{Z}_4), \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), (\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30,11,9,0;11,9,8,7,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,11,9,0;9,8,7,0)	3	$\mathbb{Z}_6 \times D_5, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), \mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,11,9,0;10,9,8,7,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,11,7,0;11,10,7,0)	1	$\mathbb{Z}_6 \times S_5$
	QSRD(30,11,7,0;11,8,7,0)	1	$\mathbb{Z}_3 \times S_5$
	QSRD(30,11,9,0;8,0)	1	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30,11,5,4;6,0)	1	1209323520
	QSRD(30,11,6,4;7,6,5,4,3,2,1)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,11,4,4;7,6,5,4,3,2,1)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,11,8,0;11,9,8,7,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,11,8,0;10,9,8,7,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,11,10,0;9,8,7,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,11,8,0;9,8,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,11,8,0;9,8,7,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,12,10,4;7,6,5,4,0)	1	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30,12,9,4;7,6,5,4,0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,12,7,4;9,6,5,4)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,12,8,4;8,6,3)	2	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRD(30,12,9,0;11,10,9,0)	2	$\mathbb{Z}_6 \times D_5, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,12,9,0;12,11,10,9,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,12,11,0;11,10,9,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,12,9,0;10,9,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,12,10,0;10,9,0)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4, \mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,12,10,0;11,9,0)	1	$\mathbb{Z}_5^3 : (\mathbb{Z}_4 \times S_4)$
	QSRD(30,12,4,4;8,7,4,0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_5 : (A_4 : \mathbb{Z}_4))$
	QSRD(30,12,8,4;8,7,6,4,2)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,12,8,3;8,6,4)	1	$S_5 \times S_3$
	QSRD(30,12,8,6;8,4,3)	1	$S_5 \times S_3$
	QSRD(30,12,10,0;11,10,9,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,12,8,6;8,6,4,2,1,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,12,8,6;8,6,4,3,0)	2	$\mathbb{Z}_6 \times S_5$
	QSRD(30,13,11,0;13,12,11,0)	1	$\mathbb{Z}_6 \times D_5$
	QSRD(30,13,11,0;12,11,0)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4), \mathbb{Z}_5^3 : (\mathbb{Z}_4 \times S_4)$
	QSRD(30,13,12,0;13,12,11,0)	1	$\mathbb{Z}_6 \times (\mathbb{Z}_3^4 : S_5)$
	QSRD(30,14,9,8;10,5,4,2)	2	$\mathbb{Z}_6 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)$
	QSRD(30,14,9,8;10,3,2)	4	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,14,6,6;9,8,7,6)	2	$\mathbb{Z}_{15} : \mathbb{Z}_4$
	QSRD(30,14,7,6;8,7,6)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_3^4 : (\mathbb{Z}_5 : \mathbb{Z}_4))$
	QSRD(30,14,13,0;14,13,0)	1	$\mathbb{Z}_6 \times (\mathbb{Z}_3^4 : S_5)$
	QSRD(30,14,9,8;10,5,4,3,2,1,0)	2	$\mathbb{Z}_6 \times D_5$
	QSRD(30,14,9,8;10,5,3,2,0)	2	$\mathbb{Z}_6 \times S_5$
	QSRD(30,14,9,8;10,5,0)	2	17915904000000
	QSRD(30,14,10,6;10,8,7,6,5)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRD(30,14,6,6;8,7,6)	2	$\mathbb{Z}_3 \times (\mathbb{Z}_3^4 : (\mathbb{Z}_5 : \mathbb{Z}_4))$
	QSRD(30,16,12,9;12,8,6)	1	$S_5 \times S_3$

Tablica 4.46: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja

$n = 30$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
30	QSRD(30, 18, 14, 10; 13, 12, 11)	4	$\mathbb{Z}_{15} : \mathbb{Z}_4, (4)$
	QSRG(30, 2, 2, 0; 1, 0)	3	$29859840, 720000000, \mathbb{Z}_2 \times (\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times ((\mathbb{Z}_2^3 : \mathbb{Z}_3) : \mathbb{Z}_2)))$
	QSRG(30, 3, 0; 2, 1, 0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2))), (2)$
	QSRG(30, 3, 0; 1, 0)	1	10368000
	QSRG(30, 3, 0; 3, 0)	1	232190115840
	QSRG(30, 4, 0; 1, 0)	2	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3, S_5 \times S_3$
	QSRG(30, 4, 2; 4, 0)	1	30576476160
	QSRG(30, 4, 0; 2, 1, 0)	4	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_5 \times \mathbb{Z}_5) : (\mathbb{Z}_2^4 : \mathbb{Z}_2)), \mathbb{Z}_2 \times D_5 \times S_3, (3)$
	QSRG(30, 4, 0; 3, 0)	1	82944000
	QSRG(30, 4, 0; 4, 2, 0)	1	196608000
	QSRG(30, 5, 0; 2, 1, 0)	4	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3, (2), \mathbb{Z}_2 \times D_5 \times S_3$
	QSRG(30, 5, 0; 3, 1, 0)	2	$S_5 \times S_3, (\mathbb{Z}_3 \times \mathbb{Z}_3) : ((C10 \times \mathbb{Z}_2) : \mathbb{Z}_4)$
	QSRG(30, 5, 0; 3, 2, 1, 0)	2	$((S_3 \times S_3) : \mathbb{Z}_2) \times D_5, \mathbb{Z}_2 \times D_5 \times S_3$
	QSRG(30, 5, 0; 5, 0)	1	143327232000000
	QSRG(30, 6, 0; 3, 2, 1, 0)	4	$S_5 \times S_3, \mathbb{Z}_2 \times S_5 \times S_3, \mathbb{Z}_2 \times D_5 \times S_3, (\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRG(30, 6, 0; 5, 1, 0)	1	10368000
	QSRG(30, 6, 2; 3, 2, 1, 0)	1	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((\mathbb{Z}_5 \times \mathbb{Z}_5) : (\mathbb{Z}_2^4 : \mathbb{Z}_2))$
	QSRG(30, 6, 2; 2, 1, 0)	1	$\mathbb{Z}_2 \times D_5 \times S_3$
	QSRG(30, 6, 0; 4, 3, 2, 1, 0)	4	$\mathbb{Z}_2 \times D_5 \times S_3$
	QSRG(30, 6, 0; 6, 3, 0)	2	12093235200, 1209323520
	QSRG(30, 6, 1; 2, 1, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRG(30, 6, 3; 4, 0)	1	10368000
	QSRG(30, 6, 0; 2, 1, 0)	1	$\mathbb{Z}_2 \times D_5 \times S_3$
	QSRG(30, 6, 0; 4, 2, 1, 0)	1	$\mathbb{Z}_2 \times (((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2) \times S_3)$
	QSRG(30, 7, 0; 4, 3, 2, 1, 0)	3	$\mathbb{Z}_2 \times D_5 \times S_3$
	QSRG(30, 7, 0; 5, 2, 1, 0)	1	$(\mathbb{Z}_3 \times \mathbb{Z}_3) : ((C10 \times \mathbb{Z}_2) : \mathbb{Z}_4)$
	QSRG(30, 7, 0; 5, 4, 2, 1, 0)	2	$\mathbb{Z}_2 \times D_5 \times S_3, ((S_3 \times S_3) : \mathbb{Z}_2) \times D_5$
	QSRG(30, 7, 0; 6, 3, 1, 0)	1	$\mathbb{Z}_3^5 : (\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4))$
	QSRG(30, 7, 0; 6, 3, 2, 0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_3^5 : (\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)))$
	QSRG(30, 7, 0; 3, 0)	1	S_8
	QSRG(30, 7, 0; 4, 2, 1, 0)	1	$\mathbb{Z}_2 \times D_5 \times S_3$
	QSRG(30, 7, 0; 5, 3, 2, 0)	1	$\mathbb{Z}_2 \times S_5 \times S_3$
	QSRG(30, 8, 0; 7, 3, 2, 0)	1	$\mathbb{Z}_3^5 : (\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_4))$
	QSRG(30, 8, 0; 5, 4, 3, 2, 1, 0)	2	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3, \mathbb{Z}_2 \times D_5 \times S_3$
	QSRG(30, 8, 0; 8, 4, 2, 0)	1	1966080
	QSRG(30, 8, 3; 6, 4, 0)	1	1036800
	QSRG(30, 8, 0; 6, 4, 3, 0)	1	$\mathbb{Z}_2 \times S_5 \times S_3$
	QSRG(30, 8, 0; 5, 4, 3, 2, 0)	1	$\mathbb{Z}_2 \times D_5 \times S_3$
	QSRG(30, 8, 0; 6, 5, 3, 2, 0)	1	$\mathbb{Z}_2 \times D_5 \times S_3$
	QSRG(30, 8, 0; 7, 4, 3, 0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_3^5 : (\mathbb{Z}_2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_5) : \mathbb{Z}_2)))$
	QSRG(30, 8, 0; 6, 4, 3, 2, 0)	2	$((S_3 \times S_3) : \mathbb{Z}_2) \times D_5, \mathbb{Z}_2 \times D_5 \times S_3$
	QSRG(30, 8, 1; 4, 3, 2, 1, 0)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRG(30, 8, 0; 4, 0)	1	S_8
	QSRG(30, 8, 6; 8, 0)	1	339738624000
	QSRG(30, 8, 0; 4, 3, 2, 1, 0)	1	$\mathbb{Z}_2 \times D_5 \times S_3$
	QSRG(30, 9, 0; 6, 5, 4, 0)	3	$\mathbb{Z}_2 \times S_5 \times S_3, \mathbb{Z}_2 \times D_5 \times S_3, (\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRG(30, 9, 0; 7, 6, 5, 4, 0)	1	$\mathbb{Z}_2 \times D_5 \times S_3$
	QSRG(30, 9, 0; 7, 5, 4, 2, 1)	1	$((\mathbb{Z}_5 \times \mathbb{Z}_5) : D_4) \times S_3$
	QSRG(30, 9, 0; 9, 3)	1	7255941120
	QSRG(30, 9, 0; 9, 6, 3, 0)	2	1209323520
	QSRG(30, 9, 0; 6, 5, 4, 3, 2, 1)	1	$\mathbb{Z}_2 \times D_5 \times S_3$
	QSRG(30, 9, 0; 8, 4, 0)	1	10368000
	QSRG(30, 10, 0; 8, 6, 5, 0)	1	$S_5 \times S_3$
	QSRG(30, 10, 0; 10, 5, 0)	1	35831808000000
	QSRG(30, 10, 3; 4, 3, 2)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$
	QSRG(30, 10, 0; 8, 5, 4, 0)	2	$S_6 \times D_5, \mathbb{Z}_2 \times S_4 \times D_5$
	QSRG(30, 10, 5; 10, 0)	1	214990848000000
	QSRG(30, 10, 0; 8, 7, 6, 5, 0)	1	$\mathbb{Z}_2 \times D_5 \times S_3$
	QSRG(30, 10, 0; 7, 6, 5, 0)	2	$\mathbb{Z}_2 \times D_5 \times S_3, (\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$
	QSRG(30, 11, 0; 9, 8, 7, 0)	2	$\mathbb{Z}_2 \times D_5 \times S_3$
QSRG(30, 11, 0; 10, 7, 0)	1	20736000	
QSRG(30, 11, 0; 8, 7, 0)	1	$S_5 \times S_3$	
QSRG(30, 12, 4; 8, 7, 6, 4, 2)	1	$(\mathbb{Z}_5 : \mathbb{Z}_4) \times S_3$	
QSRG(30, 12, 3; 8, 6, 4)	1	$S_5 \times S_3$	
QSRG(30, 12, 4; 12, 6, 4, 2)	1	1966080	
QSRG(30, 12, 4; 8, 6, 5, 4)	2	$\mathbb{Z}_2 \times D_5 \times S_3$	
QSRG(30, 12, 0; 12, 6)	1	1934917632000000	
QSRG(30, 12, 9; 12, 0)	1	1741425868800	
QSRG(30, 12, 0; 11, 10, 9, 0)	1	$\mathbb{Z}_2 \times (\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times S_4))$	
QSRG(30, 12, 0; 12, 9, 0)	1	14511882240	
QSRG(30, 13, 0; 12, 11, 0)	2	$\mathbb{Z}_2 \times (\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times S_4)), 1866240$	
QSRG(30, 14, 0; 13, 0)	1	2615348736000	
QSRG(30, 14, 6; 8, 7, 6, 5)	1	$\mathbb{Z}_3 \times (\mathbb{Z}_5 : \mathbb{Z}_4)$	
QSRG(30, 16, 6; 16, 12, 8)	1	23592960	
QSRG(30, 18, 8; 16, 9)	1	21772800	
QSRG(30, 18, 9; 18, 12)	1	7255941120	
QSRG(30, 20, 12; 16, 15)	1	$S_5 \times S_6$	

Tablica 4.47: Grafovi dobiveni konstrukcijom iz tranzitivnih permutacijskih grupa stupnja

$n = 30$

Konstrukcijom iz teorema 2.3.3 i 2.3.4 dobiveni su sljedeći rezultati. Za tranzitivne permutacijske grupe stupnja $n \in \{1, \dots, 30\} \setminus \{22, 24, 28, 30\}$ napravili smo potpunu klasifikaciju opisanu sljedećim teoremom.

Teorem 4.1.1. 1. Postoji, do na izomorfizam, 478 kvazi-jako regularnih grafova na koje djeluje tranzitivna grupa automorfizama stupnja n , $n \in \{1, \dots, 30\} \setminus \{22, 24, 28, 30\}$, od kojih su njih 19 jako regularni grafovi.

2. Postoje, do na izomorfizam, 2920 usmjerenih kvazi-jako regularnih grafova na koje djeluje tranzitivna grupa automorfizama stupnja n , $n \in \{1, \dots, 30\} \setminus \{22, 24, 28, 30\}$, od kojih su njih 478 usmjereni jako regularni grafovi.

Za permutacijske tranzitivne neregularne grupe stupnja $n \in \{22, 24, 28, 30\}$ napravili smo potpunu klasifikaciju opisanu sljedećim teoremima.

Teorem 4.1.2. 1. Postoji, do na izomorfizam, 41 kvazi-jako regularan graf na koje djeluje tranzitivna neregularna grupa automorfizama stupnja 22, od kojih su njih dva jako regularni grafovi.

2. Postoji, do na izomorfizam, 18 usmjerenih kvazi-jako regularnih grafova na koje djeluje tranzitivna neregularna grupa automorfizama stupnja 22.

Teorem 4.1.3. 1. Postoji, do na izomorfizam, 7853 kvazi-jako regularna grafa na koje djeluje tranzitivna neregularna grupa automorfizama stupnja 24.

2. Postoji, do na izomorfizam, 68235 usmjerenih kvazi-jako regularnih grafova na koje djeluje tranzitivna neregularna grupa automorfizama stupnja 24, od kojih su njih 64 usmjereni jako regularni grafovi.

Teorem 4.1.4. 1. Postoji, do na izomorfizam, 215 kvazi-jako regularnih grafova na koje djeluje tranzitivna neregularna grupa automorfizama stupnja 28, od kojih su njih dva jako regularni grafovi.

2. Postoji, do na izomorfizam, 469 usmjerenih kvazi-jako regularnih grafova na koje djeluje tranzitivna neregularna grupa automorfizama stupnja 28, od kojih su njih 22 usmjereni jako regularni grafovi.

Teorem 4.1.5. 1. Postoji, do na izomorfizam, 150 kvazi-jako regularnih grafova na koje djeluje tranzitivna neregularna grupa automorfizama stupnja 30, od kojih su njih 40 jako regularni grafovi.

2. Postoje, do na izomorfizam, 642 usmjereni kvazi-jako regularni grafa na koje djeluje tranzitivna neregularna grupa automorfizama stupnja 30.

Matrice susjedstva konstruiranih (usmjerenih) regularnih grafova na n vrhova iz kataloga tranzitivnih grupa, $n \in \{1, \dots, 30\}$, dostupne su na:

`www.math.uniri.hr/~matea.zubovic/Transitive.zip`

4.2. GRAFOVI KONSTRUIRANI IZ KATALOGA PRIMITIVNIH GRUPA

U nastavku navodimo usmjerene grafove dobivene konstrukcijom iz teorema 2.3.3 i 2.3.4 iz primitivnih permutacijskih reprezentacija grupa stupnja $n \in \{31, \dots, 200\}$ iz GAP-ovog kataloga primitivnih grupa. Iako promatramo usmjerene regularne grafove, konstrukcijom iz teorema 2.3.3 i 2.3.4 dobili smo i neusmjerene grafove, pa i njih navodimo u tablicama.

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
31	QSRD(31,3,0,0;2,1,0)	1	$\mathbb{Z}_{31} : \mathbb{Z}_3$
	QSRD(31,5,0,1;2,0)	1	$\mathbb{Z}_{31} : \mathbb{Z}_5$
	QSRD(31,6,0,0;4,3,2,1,0)	1	$\mathbb{Z}_{31} : \mathbb{Z}_3$
	QSRD(31,10,0,3;6,4,2)	1	$\mathbb{Z}_{31} : \mathbb{Z}_5$
	QSRG(31,2,0;1,0)	1	D_{31}
	QSRG(31,4,0;3,2,1,0)	1	D_{31}
	QSRG(31,4,0;2,1,0)	5	D_{31}
	QSRG(31,6,0;3,2,1,0)	5	D_{31}
	QSRG(31,6,2;3,2,1,0)	1	D_{31}
	QSRG(31,6,0;5,4,3,2,1,0)	1	D_{31}
	QSRG(31,6,0;4,3,2,1,0)	7	D_{31}
	QSRG(31,6,0;2,1,0)	2	D_{31}
	QSRG(31,6,2;2,1,0)	3	$D_{31} (2), \mathbb{Z}_{31} : \mathbb{Z}_6$
	QSRG(31,8,0;6,5,4,3,2,1,0)	1	D_{31}
	QSRG(31,8,0;5,4,2,1,0)	1	D_{31}
	QSRG(31,8,0;5,4,3,2,1)	1	D_{31}
	QSRG(31,8,0;6,4,3,2,1,0)	3	D_{31}
	QSRG(31,8,0;5,4,3,2,1,0)	3	D_{31}
	QSRG(31,8,0;7,6,5,4,3,2,1,0)	1	D_{31}
	QSRG(31,8,0;5,4,2,1)	1	D_{31}
	QSRG(31,8,0;4,3,2,1,0)	1	D_{31}
	QSRG(31,10,0;9,8,7,6,5,4,3,2,1,0)	1	D_{31}
	QSRG(31,10,0;8,7,6,5,4,3,2,1)	1	D_{31}
QSRG(31,10,3;4,2)	1	$\mathbb{Z}_{31} : \mathbb{Z}_{10}$	
DRT(31,15,7,8)	1	$\mathbb{Z}_{31} : \mathbb{Z}_{15}$	
35	SRG(35,16,6,8)	1	S_8
	QSRG(35,4,0;1,0)	1	S_7
	QSRG(35,12,5;4,0)	1	S_7
36	QSRD(36,7,0,0;4,1)	1	$PSU(3,3)$
	SRG(36,10,4,2)	1	1036800
	SRG(36,14,4,6)	1	$PSU(3,3) : \mathbb{Z}_2$
	SRG(36,14,7,4)	1	S_9
	SRG(36,15,6,6)	1	$O(5,3) : \mathbb{Z}_2$
	QSRG(36,5,0;1,0)	1	$(A_6, \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRG(36,7,2;2,1,0)	1	$PSL(2,8)$
	QSRG(36,10,2;4,3,2)	1	$A_6 : \mathbb{Z}_2$
	QSRG(36,20,11;12,8)	1	$(A_6, \mathbb{Z}_2) : \mathbb{Z}_2$
37	QSRD(37,3,0,0;2,1,0)	1	$\mathbb{Z}_{37} : \mathbb{Z}_3$
	QSRD(37,6,0,0;3,2,1,0)	1	$\mathbb{Z}_{37} : \mathbb{Z}_3$
	QSRD(37,6,0,0;4,3,2,1,0)	1	$\mathbb{Z}_{37} : \mathbb{Z}_3$
	QSRD(37,9,0,2;6,3,2,1)	1	$\mathbb{Z}_{37} : \mathbb{Z}_3$
	QSRD(37,9,0,2;4,2,1)	1	$\mathbb{Z}_{37} : \mathbb{Z}_9$
	QSRD(37,12,6,4;7,6,4,3,2,1)	1	$\mathbb{Z}_{37} : \mathbb{Z}_3$
	QSRD(37,12,6,4;8,5,4,3,2,1)	1	$\mathbb{Z}_{37} : \mathbb{Z}_3$
	QSRD(37,15,12,6;9,8,7,5,4,3)	1	$\mathbb{Z}_{37} : \mathbb{Z}_3$
	SRG(37,18,8,9)	1	$\mathbb{Z}_{37} : \mathbb{Z}_{18}$
	QSRG(37,2,0;1,0)	1	D_{37}
	QSRG(37,4,0;2,1,0)	7	$D_{37} (6), \mathbb{Z}_{37} : \mathbb{Z}_4$
	QSRG(37,4,0;3,2,1,0)	1	D_{37}

Tablica 4.48: Grafovi dobiveni konstrukcijom iz primitivnih permutacijskih grupa stupnja $n \in \{31, \dots, 37\}$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)	
37	QSRG(37,66,0;4,3,2,1,0)	10	D_{37}	
	QSRG(37,6,2;2,1,0)	4	$D_{37}(3), \mathbb{Z}_{37} : \mathbb{Z}_6$	
	QSRG(37,6,0;2,1,0)	7	D_{37}	
	QSRG(37,6,2;3,2,1,0)	1	D_{37}	
	QSRG(37,6,0;3,2,1,0)	8	D_{37}	
	QSRG(37,6,0;5,4,3,2,1,0)	1	D_{37}	
	QSRG(37,8,0;5,4,3,2,1,0)	11	D_{37}	
	QSRG(37,8,0;6,4,3,2,1,0)	6	D_{37}	
	QSRG(37,8,0;5,4,2,1,0)	4	D_{37}	
	QSRG(37,8,0;4,3,2,1,0)	13	$D_{37}(11), \mathbb{Z}_{37} : \mathbb{Z}_4(2)$	
	QSRG(37,8,0;4,2,1,0)	1	D_{37}	
	QSRG(37,8,0;6,5,4,3,2,1,0)	1	D_{37}	
	QSRG(37,8,0;7,6,5,4,3,2,1,0)	1	D_{37}	
	QSRG(37,10,0;7,6,5,4,3,2,1,0)	5	D_{37}	
	QSRG(37,10,0;6,5,4,3,2,1)	1	D_{37}	
	QSRG(37,10,0;9,8,7,6,5,4,3,2,1,0)	1	D_{37}	
	QSRG(37,10,0;6,5,4,3,2,1,0)	2	D_{37}	
	QSRG(37,10,0;8,6,5,4,3,2,1,0)	2	D_{37}	
	QSRG(37,10,0;6,5,4,3,2)	1	D_{37}	
	QSRG(37,10,0;8,6,4,3,2,1)	1	D_{37}	
	QSRG(37,10,0;8,7,6,5,4,3,2,1,0)	1	D_{37}	
	QSRG(37,10,0;7,6,5,4,2,1,0)	1	D_{37}	
	QSRG(37,10,0;7,5,4,3,2,1)	1	D_{37}	
	QSRG(37,12,0;11,10,9,8,7,6,5,4,3,2,1,0)	1	D_{37}	
	QSRG(37,12,4;6,5,4,3,2)	2	D_{37}	
	QSRG(37,12,0;10,9,8,7,6,5,4,3,2,1)	1	D_{37}	
	QSRG(37,12,2;5,4)	1	$\mathbb{Z}_{37} : \mathbb{Z}_{12}$	
	SRG(40,12,2,4)	2	$O(5,3) : \mathbb{Z}_2$	
	41	QSRD(41,5,0,0;2,1,0)	1	$\mathbb{Z}_{41} : \mathbb{Z}_5$
		QSRD(41,10,0,2;5,4,3,2,0)	1	$\mathbb{Z}_{41} : \mathbb{Z}_5$
SRG(41,20,9,10)		1	$\mathbb{Z}_{41} : \mathbb{Z}_{20}$	
QSRG(41,4,0;2,1,0)		1	$\mathbb{Z}_{41} : \mathbb{Z}_4$	
QSRG(41,8,0;4,3,2,1,0)		2	$\mathbb{Z}_{41} : \mathbb{Z}_4$	
QSRG(41,8,0;3,2,0)		1	$\mathbb{Z}_{41} : \mathbb{Z}_8$	
QSRG(41,10,0;4,3,2)		1	$\mathbb{Z}_{41} : \mathbb{Z}_{10}$	
QSRG(41,16,6;7,4)		1	$\mathbb{Z}_{41} : \mathbb{Z}_8$	
43		QSRD(43,3,0,0;2,1,0)	1	$\mathbb{Z}_{43} : \mathbb{Z}_3$
		QSRD(43,6,0,0;3,2,1,0)	2	$\mathbb{Z}_{43} : \mathbb{Z}_3$
	QSRD(43,6,0,0;4,3,2,1,0)	1	$\mathbb{Z}_{43} : \mathbb{Z}_3$	
	QSRD(43,14,0,4;7,6,5,2)	1	$\mathbb{Z}_{43} : \mathbb{Z}_7$	
	QSRD(43,7,0,0;3,2,0)	1	$\mathbb{Z}_{43} : \mathbb{Z}_7$	
	QSRG(43,6,2;2,1,0)	1	$\mathbb{Z}_{43} : \mathbb{Z}_6$	
	QSRG(43,12,2;5,4,3,2)	1	$\mathbb{Z}_{43} : \mathbb{Z}_6$	
	QSRG(43,14,3;6,4)	1	$\mathbb{Z}_{43} : \mathbb{Z}_{14}$	
DRT(43,21,10,11)	1	$\mathbb{Z}_{43} : \mathbb{Z}_{21}$		
45	SRG(45,12,3,3)	1	$O(5,3) : \mathbb{Z}_2$	
	SRG(45,16,8,4)	1	3628800	
	QSRG(45,4,1;1,0)	1	$(A_6 : \mathbb{Z}_2) : \mathbb{Z}_2$	
	QSRG(45,8,2;2,1,0)	1	$A_6 : \mathbb{Z}_2$	
	QSRG(45,8,0;2,1)	1	$(A_6, \mathbb{Z}_2) : \mathbb{Z}_2$	
	QSRG(4,16,5;8,6,4)	1	$(A_6, \mathbb{Z}_2) : \mathbb{Z}_2$	
	QSRG(45,20,9;10,5)	1	$(A_6, \mathbb{Z}_2) : \mathbb{Z}_2$	
47	DRT(47,23,11,12)	1	$\mathbb{Z}_{47} : \mathbb{Z}_{23}$	
49	QSRD(49,3,0,0;2,1,0)	1	$(\mathbb{Z}_7 \times \mathbb{Z}_7) : S_3$	
	QSRD(49,6,0,0;4,3,2,1,0)	1	$(\mathbb{Z}_7 \times \mathbb{Z}_7) : S_3$	
	QSRD(49,6,0,1;2,0)	1	$(\mathbb{Z}_7 \times \mathbb{Z}_7) : (\mathbb{Z}_3 \times S_3)$	
	QSRD(49,9,0,1;4,2,0)	1	$(\mathbb{Z}_7 \times \mathbb{Z}_7) : (\mathbb{Z}_3 \times S_3)$	
	SRG(49,12,5,2)	1	50803200	
	SRG(49,18,7,6)	1	$(\mathbb{Z}_7 \times \mathbb{Z}_7) : (\mathbb{Z}_6 \times S_3)$	
	SRG(49,24,11,12)	2	$(\mathbb{Z}_7 \times \mathbb{Z}_7) : (\mathbb{Z}_3 \times D_8)$, $(\mathbb{Z}_7 \times \mathbb{Z}_7) : (\mathbb{Z}_3 \times SL(2,3))$	
	QSRG(49,4,0;2,1,0)	1	$(\mathbb{Z}_7 \times \mathbb{Z}_7) : D_4$	
	QSRG(49,6,2;2,1,0)	1	$(\mathbb{Z}_7 \times \mathbb{Z}_7) : D_6$	
	QSRG(49,8,0;4,3,2,1,0)	1	$(\mathbb{Z}_7 \times \mathbb{Z}_7) : \mathbb{Z}_4$	
	QSRG(49,8,0;2,1,0)	2	$(\mathbb{Z}_7 \times \mathbb{Z}_7) : D_8, (\mathbb{Z}_7 \times \mathbb{Z}_7) : SL(2,3)$	
	QSRG(49,12,2;4,3,2)	1	$(\mathbb{Z}_7 \times \mathbb{Z}_7) : ((\mathbb{Z}_6 \times \mathbb{Z}_2) : \mathbb{Z}_2)$	
	QSRG(49,12,0;8,7,4,2,1)	1	$(\mathbb{Z}_7 \times \mathbb{Z}_7) : D_4$	
	QSRG(49,12,2;6,4,3,2,1)	1	$(\mathbb{Z}_7 \times \mathbb{Z}_7) : D_4$	
	QSRG(49,16,6;5,4)	1	$(\mathbb{Z}_7 \times \mathbb{Z}_7) : QD_{16}$	

Tablica 4.49: Grafovi dobiveni konstrukcijom iz primitivnih permutacijskih grupa stupnja $n \in \{37, \dots, 49\}$

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
50	SRG(50,7,0,1)	1	$PSU(3,5) : \mathbb{Z}_2$
52	QSRG(52,6,6,2;1,0)	1	$PSL(3,3) : \mathbb{Z}_2$
	QSRG(52,18,3;8,6)	1	$PSL(3,3) : \mathbb{Z}_2$
	QSRG(52,27,14;18,12)	1	$PSL(3,3) : \mathbb{Z}_2$
53	QSRD(53,13,0,2;6,3,2)	1	$\mathbb{Z}_{53} : \mathbb{Z}_{13}$
	SRG(53,26,12,13)	1	$\mathbb{Z}_{53} : \mathbb{Z}_{26}$
	QSRG(53,4,0;2,1,0)	1	$\mathbb{Z}_{53} : \mathbb{Z}_4$
	QSRG(53,8,0;2,1,0)	1	$\mathbb{Z}_{53} : \mathbb{Z}_4$
	QSRG(53,8,0;4,3,2,1,0)	2	$\mathbb{Z}_{53} : \mathbb{Z}_4$
	QSRG(53,8,0;3,2,1,0)	1	$\mathbb{Z}_{53} : \mathbb{Z}_4$
	QSRG(53,12,2;5,4,2,1)	1	$\mathbb{Z}_{53} : \mathbb{Z}_4$
	QSRG(53,12,0;5,4,3,2,1)	1	$\mathbb{Z}_{53} : \mathbb{Z}_4$
	QSRG(53,12,0;8,7,4,2,1,0)	1	$\mathbb{Z}_{53} : \mathbb{Z}_4$
	QSRG(53,12,2;4,3,2,0)	1	$\mathbb{Z}_{53} : \mathbb{Z}_4$
55	QSRD(53,3,0,0;1,0)	1	$PSL(2,11)$
	QSRD(55,6,0,0;4,1,0)	1	$PSL(2,11)$
	QSRD(55,15,12,4;5,4,3,2)	1	$PSL(2,11)$
	QSRD(55,30,24,16;20,16,14)	1	$PSL(2,11)$
	SRG(55,18,9,4)	1	39916800
	QSRG(55,4,0;1,0)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(55,6,1;1,0)	3	$PSL(2,11), PSL(2,11) : \mathbb{Z}_2 (2)$
	QSRG(55,8,3;2,1,0)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(55,12,1;4,2,0)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(55,12,4;4,2,1,0)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(55,12,0;4,3,2)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(55,12,2;4,3,2)	2	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(55,20,6;12,7,5)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(55,24,11;12,9,8,6)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(55,24,9;12,10)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(55,24,10;13,9,8)	1	$PSL(2,11) : \mathbb{Z}_2$
QSRG(55,32,18;20,16)	1	$PSL(2,11) : \mathbb{Z}_2$	
56	SRG(56,10,0,2)	1	$PSL(3,4) : (\mathbb{Z}_2 \times \mathbb{Z}_2)$
	QSRG(56,10,0;4,1)	1	S_8
	QSRG(56,15,6;4,0)	1	S_8
	QSRG(56,30,15;18,16)	1	S_8
57	QSRG(57,6,0;1,0)	1	$PSL(2,19)$
	QSRG(57,20,7;10,6)	1	$PSL(2,19)$
	QSRG(57,30,14;18,15)	1	$PSL(2,19)$
59	DRT(59,29,14,15)	1	$\mathbb{Z}_{59} : \mathbb{Z}_{29}$
60	QSRG(60,12,5;3,1,0)	1	$(A_5 \times A_5) : \mathbb{Z}_2$
	QSRG(60,15,2;5,3)	1	$(A_5 \times A_5) : (\mathbb{Z}_2 \times \mathbb{Z}_2)$
	QSRG(60,20,7;8,5)	1	$(A_5 \times A_5) : (\mathbb{Z}_2 \times \mathbb{Z}_2)$
	QSRG(60,24,8;12,8)	1	$(A_5 \times A_5) : (\mathbb{Z}_2 \times \mathbb{Z}_2)$
	QSRG(60,27,10;16,12)	1	$(A_5 \times A_5) : \mathbb{Z}_2$
61	QSRD(61,5,0,0;2,1,0)	1	$\mathbb{Z}_{61} : \mathbb{Z}_5$
	QSRD(61,10,0,2;4,2,1,0)	1	$\mathbb{Z}_{61} : \mathbb{Z}_5$
	QSRD(61,15,0,4;8,6,5,3,2)	1	$\mathbb{Z}_{61} : \mathbb{Z}_5$
	QSRD(61,15,10,2;7,6,5,4,3,2)	1	$\mathbb{Z}_{61} : \mathbb{Z}_5$
	QSRD(61,15,0,4;6,3,2)	1	$\mathbb{Z}_{61} : \mathbb{Z}_{15}$
	SRG(61,30,14,15)	1	$\mathbb{Z}_{61} : \mathbb{Z}_{30}$
	QSRG(61,4,0;2,1,0)	1	$\mathbb{Z}_{61} : \mathbb{Z}_4$
	QSRG(61,6,2;2,1,0)	1	$\mathbb{Z}_{61} : \mathbb{Z}_6$
	QSRG(61,8,0;2,1,0)	2	$\mathbb{Z}_{61} : \mathbb{Z}_4$
	QSRG(61,8,0;4,3,2,1,0)	2	$\mathbb{Z}_{61} : \mathbb{Z}_4$
	QSRG(61,8,0;3,2,1,0)	1	$\mathbb{Z}_{61} : \mathbb{Z}_4$
	QSRG(61,10,0;3,2,0)	1	$\mathbb{Z}_{61} : \mathbb{Z}_{10}$
	QSRG(61,12,2;4,3,2,1,0)	1	$\mathbb{Z}_{61} : \mathbb{Z}_4$
	QSRG(61,12,0;8,7,4,2,1,0)	1	$\mathbb{Z}_{61} : \mathbb{Z}_4$
	QSRG(61,12,2;4,3,2,0)	4	$\mathbb{Z}_{61} : \mathbb{Z}_4 (2), \mathbb{Z}_{61} : \mathbb{Z}_6, \mathbb{Z}_{61} : \mathbb{Z}_{12}$
	QSRG(61,12,0;6,4,3,2,0)	1	$\mathbb{Z}_{61} : \mathbb{Z}_4$
	QSRG(61,12,0;5,4,3,2,0)	1	$\mathbb{Z}_{61} : \mathbb{Z}_4$
	QSRG(61,12,0;6,5,4,3,2,1,0)	1	$\mathbb{Z}_{61} : \mathbb{Z}_4$
	QSRG(61,12,2;4,3,2,1)	1	$\mathbb{Z}_{61} : \mathbb{Z}_6$
	QSRG(61,12,0;6,5,4,2,1,0)	1	$\mathbb{Z}_{61} : \mathbb{Z}_4$
	QSRG(61,12,0;5,4,3,2,1,0)	1	$\mathbb{Z}_{61} : \mathbb{Z}_4$
	QSRG(61,16,0;12,9,8,6,5,4,3,2)	1	$\mathbb{Z}_{61} : \mathbb{Z}_4$
	QSRG(61,18,4;8,5,4)	1	$\mathbb{Z}_{61} : \mathbb{Z}_6$
QSRG(61,20,6;8,5)	1	$\mathbb{Z}_{61} : \mathbb{Z}_{20}$	

Tablica 4.50: Grafovi dobiveni konstrukcijom iz primitivnih permutacijskih grupa stupnja $n \in \{50, \dots, 61\}$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
63	QSRD(63,16,0,3;8,7,2)	1	$PSU(3,3)$
	SRG(63,30,13,15)	2	$1451520, PSU(3,3) : \mathbb{Z}_2$
	QSRG(63,6,1;1,0)	2	$PSU(3,3) : \mathbb{Z}_2$
	QSRG(64,24,10;9,4)	2	$PSU(3,3) : \mathbb{Z}_2$
64	SRG(64,14,6,2)	1	3251404800
	SRG(64,18,2,6)	1	$\mathbb{Z}_2^6 : ((\mathbb{Z}_3 A_6) : \mathbb{Z}_2)$
	SRG(64,21,8,6)	2	$\mathbb{Z}_2^6 : (PSL(3,2) \times S_3),$ $\mathbb{Z}_2^6 : (PSL(3,2) : \mathbb{Z}_2)$
	SRG(64,27,10,12)	1	3317760
	SRG(64,28,12,12)	1	2580480
	QSRG(64,7,7,0;2,0)	1	$\mathbb{Z}_2^6 : S_7$
	QSRG(64,9,2;2,0)	1	$(((((A_4 \times A_4) : \mathbb{Z}_2) \times A_4) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2$
	QSRG(64,21,10;6,0)	1	$\mathbb{Z}_2^6 : S_7$
	QSRG(64,27,8;18,12)	1	$(((((A_4 \times A_4) : \mathbb{Z}_2) \times A_4) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2$
65	QSRG(65,10,3;2,0)	1	$PSL(2,25) : \mathbb{Z}_2$
	QSRG(65,24,8;12,8)	1	$PSL(2,25) : \mathbb{Z}_2$
	QSRG(65,30,13;15,12)	1	$PSL(2,25) : \mathbb{Z}_2$
	QSRG(65,10,3;2,0)	1	$PSL(2,25) : \mathbb{Z}_2$
	QSRG(65,24,8;12,8)	1	$PSL(2,25) : \mathbb{Z}_2$
	QSRG(65,30,13;15,12)	1	$PSL(2,25) : \mathbb{Z}_2$
66	SRG(66,20,10,4)	1	479001600
	QSRG(66,5,0;1,0)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(66,10,4;2,1,0)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(66,10,3;4,2,1,0)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(66,10,2;2,1,0)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(66,10,0;4,3,2,1,0)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(66,15,0;5,3)	1	M_{11}
	QSRG(66,20,6;8,7,6,3)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(66,20,7;6,4)	1	$PSL(2,11) : \mathbb{Z}_2$
	QSRG(66,30,15;15,8)	1	M_{11}
67	QSRD(67,11,0,2;4,2,1,0)	1	$\mathbb{Z}_{67} : \mathbb{Z}_{11}$
	QSRD(67,22,0,8;11,8,5,4)	1	$\mathbb{Z}_{67} : \mathbb{Z}_{11}$
	QSRG(67,6,2;2,1,0)	1	$\mathbb{Z}_{67} : \mathbb{Z}_6$
	QSRG(67,12,2;4,3,2,1,0)	2	$\mathbb{Z}_{67} : \mathbb{Z}_6$
	QSRG(67,12,2;4,3,2,0)	1	$\mathbb{Z}_{67} : \mathbb{Z}_6$
	QSRG(67,18,18,4;8,6,5,4,3)	1	$\mathbb{Z}_{67} : \mathbb{Z}_6$
	QSRG(67,18,4;8,5,4,3,2)	1	$\mathbb{Z}_{67} : \mathbb{Z}_6$
	QSRG(67,18,2;7,6,5,4)	1	$\mathbb{Z}_{67} : \mathbb{Z}_6$
	QSRG(67,22,6;9,6)	1	$\mathbb{Z}_{67} : \mathbb{Z}_{22}$
	DRT(67,33,16,17)	1	$\mathbb{Z}_{67} : \mathbb{Z}_{33}$
68	QSRG(68,12,1;3,0)	1	$PSL(2,16) : \mathbb{Z}_4$
	QSRG(68,15,2;5,3)	1	$PSL(2,16) : \mathbb{Z}_4$
	QSRG(68,20,3;8,7,5)	1	$PSL(2,16) : \mathbb{Z}_2$
	QSRG(68,35,18;20,16)	1	$PSL(2,16) : \mathbb{Z}_2$
	QSRG(68,40,24;24,20)	1	$PSL(2,16) : \mathbb{Z}_4$
71	QSRD(71,5,0,0;2,1,0)	1	$\mathbb{Z}_{71} : \mathbb{Z}_5$
	QSRD(71,7,0,0;2,1,0)	1	$\mathbb{Z}_{71} : \mathbb{Z}_5$
	QSRD(71,10,0,2;5,2,1,0)	1	$\mathbb{Z}_{71} : \mathbb{Z}_5$
	QSRD(71,10,0,2;4,3,2,1,0)	1	$\mathbb{Z}_{71} : \mathbb{Z}_5$
	QSRD(71,15,0,2;9,6,4,3,2,1,0)	1	$\mathbb{Z}_{71} : \mathbb{Z}_5$
	QSRD(71,15,0,4;6,5,4,3,2,0)	1	$\mathbb{Z}_{71} : \mathbb{Z}_5$
	QSRG(71,10,0;2,1,0)	1	$\mathbb{Z}_{71} : \mathbb{Z}_{10}$
	QSRG(71,14,0;5,4,2)	1	$\mathbb{Z}_{71} : \mathbb{Z}_{14}$
	QSRG(71,20,6;7,6,5,2)	1	$\mathbb{Z}_{71} : \mathbb{Z}_{10}$
	QSRG(71,20,6;7,6,4,3)	1	$\mathbb{Z}_{71} : \mathbb{Z}_{10}$
	QSRG(71,30,14;15,13,9,8)	1	$\mathbb{Z}_{71} : \mathbb{Z}_{10}$
	DRT(71,35,17,18)	1	$\mathbb{Z}_{71} : \mathbb{Z}_{35}$

Tablica 4.51: Grafovi dobiveni konstrukcijom iz primitivnih permutacijskih grupa stupnja $n \in \{63, \dots, 71\}$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
73	QSRD(73,9,0,1;2,0)	1	$\mathbb{Z}_{73} : \mathbb{Z}_9$
	QSRD(73,27,18,11;14,10,8,6)	1	$\mathbb{Z}_{73} : \mathbb{Z}_9$
	SRG(73,36,17,18)	1	$\mathbb{Z}_{73} : \mathbb{Z}_{36}$
	QSRG(73,4,0;2,1,0)	1	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(73,6,2;2,1,0)	1	$\mathbb{Z}_{73} : \mathbb{Z}_6$
	QSRG(73,8,0;4,3,2,1,0)	1	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(7,8,0;2,1,0)	4	$\mathbb{Z}_{73} : \mathbb{Z}_4 (3), \mathbb{Z}_{73} : \mathbb{Z}_8$
	QSRG(73,8,0;3,2,1,0)	1	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(73,12,0;4,3,2,0)	2	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(73,12,0;8,7,4,2,1,0)	1	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(73,12,2;4,3,2,1,0)	7	$\mathbb{Z}_{73} : \mathbb{Z}_4 (4), \mathbb{Z}_{73} : \mathbb{Z}_6 (3)$
	QSRG(73,12,0;6,5,4,2,1,0)	2	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(73,12,0;5,4,3,2,0)	1	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(73,12,0;6,4,3,2,1,0)	3	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(73,12,0;4,3,2,1,0)	2	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(73,12,0;5,4,3,2,1,0)	1	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(73,12,0;5,4,2,1,0)	1	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(73,12,2;4,2,1,0)	1	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(73,12,2;3,2,0)	1	$\mathbb{Z}_{73} : \mathbb{Z}_{12}$
	QSRG(73,16,0;12,9,8,6,4,3,2,1,0)	1	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(73,16,0;9,8,6,5,4,3,2,1)	1	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(73,16,0;10,9,6,4,3,2,0)	1	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(7,16,0;8,7,6,5,4,3,2)	1	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(73,16,0;7,6,5,4,3,2)	1	$\mathbb{Z}_{73} : \mathbb{Z}_4$
	QSRG(73,16,0;8,6,4,3,2)	1	$\mathbb{Z}_{73} : \mathbb{Z}_8$
	QSRG(73,18,4;8,6,5,4,3,2)	2	$\mathbb{Z}_{73} : \mathbb{Z}_6$
	QSRG(73,18,4;8,7,4,3,2)	1	$\mathbb{Z}_{73} : \mathbb{Z}_6$
	QSRG(73,18,2;7,6,4,3)	1	$\mathbb{Z}_{73} : \mathbb{Z}_6$
	QSRG(73,18,5;6,4,2)	1	$\mathbb{Z}_{73} : \mathbb{Z}_{18}$
	QSRG(73,24,8;11,9,8,7,6,4)	1	$\mathbb{Z}_{73} : \mathbb{Z}_4$
QSRG(73,24,8;9,6)	1	$\mathbb{Z}_{73} : \mathbb{Z}_{24}$	
77	SRG(77,16,0,4)	1	887040
78	QSRD(78,7,0,0;3,1,0)	1	$PSL(2, 13)$
	QSRD(78,14,7,2;3,2)	2	$PSL(2, 13)$
	SRG(78,22,11,4)	1	6227020800
	QSRG(78,7,7,2;2,1,0)	1	$PSL(2, 13)$
	QSRG(78,7,0;1,0)	1	$PSL(2, 13) : \mathbb{Z}_2$
	QSRG(78,14,2;4,3,2)	1	$PSL(2, 13) : \mathbb{Z}_2$
	QSRG(78,14,14,2;4,3,2,0)	1	$PSL(2, 13) : \mathbb{Z}_2$
	QSRG(78,14,2;4,2,1,0)	1	$PSL(2, 13) : \mathbb{Z}_2$
	QSRG(78,14,3;4,2,0)	1	$PSL(2, 13) : \mathbb{Z}_2$
	QSRG(78,14,4;4,2,1,0)	1	$PSL(2, 13) : \mathbb{Z}_2$
	QSRG(78,21,4;10,6,2)	1	$PSL(2, 13)$
	QSRG(78,28,10;12,8)	1	$PSL(2, 13) : \mathbb{Z}_2$
79	QSRG(79,6,2;2,1,0)	1	$\mathbb{Z}_{79} : \mathbb{Z}_6$
	QSRG(79,12,2;4,3,2,0)	1	$\mathbb{Z}_{79} : \mathbb{Z}_6$
	QSRG(79,12,2;4,3,2,1,0)	2	$\mathbb{Z}_{79} : \mathbb{Z}_6$
	QSRG(79,12,2;2,1,0)	1	$\mathbb{Z}_{79} : \mathbb{Z}_6$
	QSRD(79,13,0,2;4,2,1,0)	1	$\mathbb{Z}_{79} : \mathbb{Z}_{13}$
	QSRG(79,18,4;7,4,3,2,0)	1	$\mathbb{Z}_{79} : \mathbb{Z}_6$
	QSRG(79,18,4;8,6,5,4,3,2)	1	$\mathbb{Z}_{79} : \mathbb{Z}_6$
	QSRG(79,18,2;7,6,5,4,3,2)	1	$\mathbb{Z}_{79} : \mathbb{Z}_6$
	QSRG(79,18,4;8,6,4,3,2)	2	$\mathbb{Z}_{79} : \mathbb{Z}_6$
	QSRG(79,18,2;6,5,4,3,2)	1	$\mathbb{Z}_{79} : \mathbb{Z}_6$
	QSRG(79,24,8;13,9,8,6,5,4)	1	$\mathbb{Z}_{79} : \mathbb{Z}_6$
	QSRG(79,26,6;10,9)	1	$\mathbb{Z}_{79} : \mathbb{Z}_{26}$
	DRT(79,39,19,20)	1	$\mathbb{Z}_{79} : \mathbb{Z}_{39}$
81	QSRD(81,5,0,0;2,1,0)	1	$\mathbb{Z}_3^4 : S_5$
	QSRD(81,10,0,0;6,2,1,0)	1	$\mathbb{Z}_3^4 : S_5$
	QSRD(81,15,0,2;7,6,5,4,3,2,0)	1	$\mathbb{Z}_3^4 : D_5$
	SRG(81,20,1,6)	1	$\mathbb{Z}_3^4 : ((A_6 : \mathbb{Z}_4) : \mathbb{Z}_2)$
	SRG(81,24,9,6)	1	$(((\mathbb{Z}_3^4 : (\mathbb{Z}_2^3 : \mathbb{Z}_2^2)) : \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2$
	SRG(81,30,9,12)	1	$\mathbb{Z}_3^4 : (\mathbb{Z}_2 \times S_6)$
	SRG(81,32,13,12)	2	$(((\mathbb{Z}_3^4 : (\mathbb{Z}_2^3 : \mathbb{Z}_2^2)) : \mathbb{Z}_3) : \mathbb{Z}_3) : \mathbb{Z}_2$, $(\mathbb{Z}_8 : \mathbb{Z}_4) : \mathbb{Z}_2$
	SRG(81,40,19,20)	2	$\mathbb{Z}_3^4 : (SL(2, 5) : (\mathbb{Z}_2 \times \mathbb{Z}_2))$, $\mathbb{Z}_3^4 : (\mathbb{Z}_5 : (\mathbb{Z}_8 : \mathbb{Z}_4))$

Tablica 4.52: Grafovi dobiveni konstrukcijom iz primitivnih permutacijskih grupa stupnja $n \in \{73, \dots, 81\}$

Stupanj	Parametri	# neizom.	Aut(S) ili Aut(S)	
81	QSRG(81,8,1;2,0)	1	$((\mathbb{Z}_3^4 : (\mathbb{Z}_2^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2$	
	QSRG(81,10,1;2,0)	1	$\mathbb{Z}_3^4 : (\mathbb{Z}_2 \times S_5)$	
	QSRG(81,16,1;8,4,2)	1	$((\mathbb{Z}_3^4 : (\mathbb{Z}_2^3 : \mathbb{Z}_2^2) : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2$	
	QSRG(81,20,7;6,4,0)	1	$\mathbb{Z}_3^4 : (\mathbb{Z}_2 \times S_5)$	
83	QSRD(83,41,0,20;21)	1	$\mathbb{Z}_{83} : \mathbb{Z}_{41}$	
84	QSRG(84,18,7;4,0)	1	S_9	
	QSRG(84,20,1;10,4)	1	S_9	
	QSRG(84,45,45,22;27,25)	1	S_9	
89	QSRD(89,11,0,1;4,2,0)	1	$\mathbb{Z}_{89} : C_{11}$	
	QSRG(89,8,0;2,1,0)	1	$\mathbb{Z}_{89} : \mathbb{Z}_8$	
	QSRG(89,16,0;7,4,3,2,0)	1	$\mathbb{Z}_{89} : \mathbb{Z}_8$	
	QSRG(89,22,3;8,6,4)	1	$\mathbb{Z}_{89} : \mathbb{Z}_{2^2}$	
	QSRG(89,24,6;10,8,7,6,5,4,3)	1	$\mathbb{Z}_{89} : \mathbb{Z}_8$	
91	QSRD(91,3,0,0;1,0)	1	$PSL(2,13)$	
	QSRD(91,6,0,0;2,1,0)	1	$PSL(2,13)$	
	QSRD(91,9,0,0;5,3,1,0)	1	$PSL(2,13)$	
	QSRD(91,12,6,1;2,1,0)	2	$PSL(2,13), 2$	
	QSRD(91,12,0,1;4,3,1,0)	1	$PSL(2,13)$	
	QSRD(91,15,6,2;4,3,2)	2	$PSL(2,13), 2$	
	QSRD(91,15,12,4;5,3,2,0)	1	$PSL(2,13)$	
	QSRD(91,28,16,9;12,10,9,8,7,6)	2	$PSL(2,13), 2$	
	QSRD(91,36,24,11;20,19,18,15,14)	1	$PSL(2,13)$	
	QSRD(91,60,48,39;42,41,40,39)	1	$PSL(2,13)$	
	SRG(91,24,12,4,24)	1	87178291200	
	QSRG(91,4,4,0;1,0)	2	$PSL(2,13), PSL(2,13) : \mathbb{Z}_2$	
	QSRG(91,6,1;1,0)	3	$PSL(2,13), PSL(2,13) : \mathbb{Z}_2, 2$	
	QSRG(91,8,0;2,1,0)	2	$PSL(2,13) : \mathbb{Z}_2, PSL(2,13)$	
	QSRG(91,12,2;4,2,1,0)	1	$PSL(2,13) : \mathbb{Z}_2$	
	QSRG(91,12,2;3,2,1,0)	1	$PSL(2,13) : \mathbb{Z}_2$	
	QSRG(91,12,3;3,1,0)	1	$PSL(2,13)$	
	QSRG(91,12,3;4,3,1,0)	1	$PSL(2,13)$	
	QSRG(91,12,2;2,1,0)	2	$PSL(2,13) : \mathbb{Z}_2, 2$	
	QSRG(91,12,0;4,3,2,1,0)	2	$PSL(2,13) : \mathbb{Z}_2, 2$	
	QSRG(91,12,1;4,2,1,0)	1	$PSL(2,13) : \mathbb{Z}_2$	
	QSRG(91,12,2;4,3,2,1,0)	1	$PSL(2,13) : \mathbb{Z}_2$	
	QSRG(91,24,7;9,8,6,4,3,0)	1	$PSL(2,13)$	
	QSRG(91,24,4;9,8,7,5,4)	1	$PSL(2,13)$	
	QSRG(91,24,6;8,6,4)	1	$PSL(2,13) : \mathbb{Z}_2$	
	QSRG(91,24,3;8,6)	1	$PSL(2,13) : \mathbb{Z}_2$	
	QSRG(91,24,6;8,7,6,4,3)	1	$PSL(2,13) : \mathbb{Z}_2$	
	QSRG(91,28,9;10,9,5,4)	1	$PSL(2,13)$	
	QSRG(91,28,9;10,9,8,3)	1	$PSL(2,13)$	
	97	SRG(97,48,23,24,48)	1	$\mathbb{Z}_{97} : \mathbb{Z}_{48}$
		QSRG(97,6,2;2,1,0)	1	$\mathbb{Z}_{97} : \mathbb{Z}_6$
		QSRG(97,8,0;2,1,0)	1	$\mathbb{Z}_{97} : \mathbb{Z}_8$
		QSRG(97,12,2;2,1,0)	2	$\mathbb{Z}_{97} : \mathbb{Z}_6, \mathbb{Z}_{97} : \mathbb{Z}_{12}$
QSRG(97,12,2;4,3,2,1,0)		3	$\mathbb{Z}_{97} : \mathbb{Z}_6, 3$	
QSRG(97,12,2;3,2,1,0)		1	$\mathbb{Z}_{97} : \mathbb{Z}_6$	
QSRG(97,16,0;8,4,2,1)		1	$\mathbb{Z}_{97} : \mathbb{Z}_8$	
QSRG(97,16,0;6,5,4,3,2,0)		1	$\mathbb{Z}_{97} : \mathbb{Z}_8$	
QSRG(97,16,0;4,2,1)		1	$\mathbb{Z}_{97} : \mathbb{Z}_{16}$	
QSRG(97,18,4;6,4,3,2,1)		2	$\mathbb{Z}_{97} : \mathbb{Z}_6, 2$	
QSRG(97,18,4;8,6,4,3,2,0)		1	$\mathbb{Z}_{97} : \mathbb{Z}_6$	
QSRG(97,18,4;8,6,4,3,2,1,0)		1	$\mathbb{Z}_{97} : \mathbb{Z}_6$	
QSRG(97,18,2;6,5,4,3,2,1)		1	$\mathbb{Z}_{97} : \mathbb{Z}_6$	
QSRG(97,18,2;6,5,4,3,2,1,0)		1	$\mathbb{Z}_{97} : \mathbb{Z}_6$	
QSRG(97,18,2;7,5,4,3,2)		1	$\mathbb{Z}_{97} : \mathbb{Z}_6$	
QSRG(97,18,2;6,5,4,3,2)		1	$\mathbb{Z}_{97} : \mathbb{Z}_6$	
QSRG(97,18,2;6,5,4,3,2,0)		2	$\mathbb{Z}_{97} : \mathbb{Z}_6, 2$	
QSRG(97,18,4;8,6,5,4,3,2,1,0)		1	$\mathbb{Z}_{97} : \mathbb{Z}_6$	
QSRG(97,18,4;7,6,4,3,2,1)		1	$\mathbb{Z}_{97} : \mathbb{Z}_6$	
QSRG(97,24,8;8,7,6,5,4,3)		1	$\mathbb{Z}_{97} : \mathbb{Z}_6$	
QSRG(97,24,8;8,6,5,4,3)		1	$\mathbb{Z}_{97} : \mathbb{Z}_{12}$	
QSRG(97,24,8;9,6,5,4,2)		1	$\mathbb{Z}_{97} : \mathbb{Z}_{12}$	
QSRG(97,24,2;8,7,6)		1	$\mathbb{Z}_{97} : \mathbb{Z}_{2^4}$	
QSRG(97,32,32,12;10,9)		1	$\mathbb{Z}_{97} : \mathbb{Z}_{32}$	

Tablica 4.53: Grafovi dobiveni konstrukcijom iz primitivnih permutacijskih grupa stupnja $n \in \{81, \dots, 97\}$

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
100	SRG(100, 18, 2, 8)	1	26336378880000
	SRG(100, 22, 0, 6)	1	88704000
	SRG(100, 36, 14, 12)	1	1209600
	QSRG(100, 6, 0; 2, 1, 0)	1	$(A_5 \times A_5) : D_4$
	QSRG(100, 9, 0; 3, 1, 0)	1	$(A_5 \times A_5) : D_4$
	QSRG(100, 12, 3; 4, 2, 0)	1	$(A_5 \times A_5) : D_4$
	QSRG(100, 36, 9; 24, 18, 16, 12)	1	$(A_5 \times A_5) : D_4$
	QSRG(100, 36, 12; 15, 14, 12, 8)	1	$(A_5 \times A_5) : D_4$
101	QSRD(101, 25, 0, 6; 9, 6, 4)	1	$\mathbb{Z}_{101} : \mathbb{Z}_{25}$
	SRG(101, 50, 24, 25, 50)	1	$\mathbb{Z}_{101} : \mathbb{Z}_{50}$
	QSRG(101, 10, 0; 2, 1, 0)	1	$\mathbb{Z}_{101} : \mathbb{Z}_{10}$
	QSRG(101, 20, 0; 8, 6, 5, 4, 3, 2)	1	$\mathbb{Z}_{101} : \mathbb{Z}_{10}$
	QSRG(101, 20, 6; 6, 4, 3, 2)	1	$\mathbb{Z}_{101} : \mathbb{Z}_{10}$
	QSRG(101, 20, 0; 6, 4, 3)	1	$\mathbb{Z}_{101} : \mathbb{Z}_{20}$
102	QSRG(102, 3, 3, 0; 1, 0)	1	$PSL(2, 17)$
	QSRG(102, 6, 1; 1, 0)	1	$PSL(2, 17)$
	QSRG(102, 8, 1; 2, 1, 0)	1	$PSL(2, 17)$
	QSRG(102, 12, 2; 2, 1, 0)	1	$PSL(2, 17)$
	QSRG(102, 14, 14, 1; 3, 2, 1, 0)	1	$PSL(2, 17)$
	QSRG(102, 24, 3; 10, 8, 6, 4)	1	$PSL(2, 17)$
	QSRG(102, 24, 5; 9, 8, 6, 4)	1	$PSL(2, 17)$
	QSRG(102, 24, 7; 8, 7, 6, 4, 0)	1	$PSL(2, 17)$
	QSRG(102, 32, 32, 7; 24, 16, 12, 10, 9)	1	$PSL(2, 17)$
	QSRG(102, 36, 12; 24, 15, 14, 13, 10)	1	$PSL(2, 17)$
103	QSRD(103, 17, 0; 2; 6, 4, 2, 1)	1	$\mathbb{Z}_{103} : \mathbb{Z}_{17}$
	QSRD(103, 51, 0, 25; 26)	1	$\mathbb{Z}_{103} : \mathbb{Z}_{51}$
	QSRG(103, 6, 2; 2, 1, 0)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 12, 2; 4, 3, 2, 1, 0)	3	$\mathbb{Z}_{103} : \mathbb{Z}_6, 3$
	QSRG(103, 12, 2; 2, 1, 0)	2	$\mathbb{Z}_{103} : \mathbb{Z}_6, 2$
	QSRG(103, 12, 2; 3, 2, 1, 0)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 18, 4; 6, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 18, 4; 8, 6, 4, 3, 2, 1, 0)	2	$\mathbb{Z}_{103} : \mathbb{Z}_6, 2$
	QSRG(103, 18, 2; 6, 4, 3, 2, 0)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 18, 2; 6, 5, 4, 3, 2, 0)	2	$\mathbb{Z}_{103} : \mathbb{Z}_6, 2$
	QSRG(103, 18, 2; 6, 5, 4, 2, 1, 0)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 18, 2; 5, 4, 3, 2, 0)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 18, 2; 5, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 18, 2; 6, 4, 3, 2, 1)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 18, 4; 6, 4, 3, 2, 1)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 18, 2; 6, 5, 4, 3, 2)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 18, 4; 7, 6, 4, 2, 1)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 18, 4; 6, 4, 3, 2, 0)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 18, 4; 7, 6, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 18, 4; 8, 6, 5, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 24, 8; 8, 6, 5, 4, 3, 2)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 24, 2; 9, 8, 7, 6, 5, 4)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
	QSRG(103, 24, 8; 8, 7, 6, 5, 4, 3, 2)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$
QSRG(103, 30, 30, 8; 14, 13, 11, 10, 9, 8, 7, 6, 3)	1	$\mathbb{Z}_{103} : \mathbb{Z}_6$	
QSRG(103, 34, 34, 12; 12, 9)	1	$\mathbb{Z}_{103} : \mathbb{Z}_{34}$	
105	SRG(105, 26, 13, 4, 26)	1	1307674368000
	SRG(105, 32, 4, 12, 32)	1	$PSL(3, 4) : D_6$
	QSRG(105, 8, 3; 1, 0)	1	$PSL(3, 4) : D_6$
	QSRG(105, 12, 5; 2, 1, 0)	1	S_8
	QSRG(105, 12, 1; 3, 2, 0)	1	S_8
	QSRG(105, 32, 10; 16, 8)	1	S_8
	QSRG(105, 48, 20; 24, 20)	1	S_8
QSRG(105, 64, 39; 48, 36)	1	$PSL(3, 4) : D_6$	
107	QSRD(107, 53, 0, 26; 27)	1	$\mathbb{Z}_{107} : C_{53}$

Tablica 4.54: Grafovi dobiveni konstrukcijom iz primitivnih permutacijskih grupa stupnja $n \in \{100, \dots, 107\}$

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})	
109	QSRD(109, 18, 0, 2; 6, 5, 4, 2, 0)	1	$\mathbb{Z}_{109} : \mathbb{Z}_9$	
	QSRD(109, 0, 0; 3, 2, 0)	1	$\mathbb{Z}_{109} : \mathbb{Z}_9$	
	QSRD(109, 27, 0, 6; 9, 8, 4)	1	$\mathbb{Z}_{109} : \mathbb{Z}_{27}$	
	SRG(109, 54, 26, 27, 54)	1	$\mathbb{Z}_{109} : \mathbb{Z}_{54}$	
	QSRG(109, 6, 2; 2, 1, 0)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 12, 2; 3, 2, 1, 0)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 12, 2; 4, 3, 2, 1, 0)	3	$\mathbb{Z}_{109} : \mathbb{Z}_6, 3$	
	QSRG(109, 12, 2; 2, 1, 0)	3	$\mathbb{Z}_{109} : \mathbb{Z}_6, 2, \mathbb{Z}_{109} : \mathbb{Z}_{12}$	
	QSRG(109, 18, 2; 6, 5, 4, 3, 2, 0)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 18, 2; 7, 6, 5, 4, 3, 2)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 18, 4; 6, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 18, 4; 8, 6, 5, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 18, 2; 5, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 18, 4; 6, 4, 3, 2, 0)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 18, 2; 6, 4, 3, 2, 1, 0)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 18, 4; 7, 6, 4, 3, 2, 1, 0)	2	$\mathbb{Z}_{109} : \mathbb{Z}_6, 2$	
	QSRG(109, 18, 2; 4, 3, 2, 1)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 18, 2; 5, 4, 3, 2, 0)	2	$\mathbb{Z}_{109} : \mathbb{Z}_6, 2$	
	QSRG(109, 18, 4; 6, 4, 3, 2, 1)	2	$\mathbb{Z}_{109} : \mathbb{Z}_6, 2$	
	QSRG(109, 18, 2; 6, 5, 4, 2, 1, 0)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 18, 4; 8, 6, 4, 3, 2, 1, 0)	2	$\mathbb{Z}_{109} : \mathbb{Z}_6, 2$	
	QSRG(109, 18, 2; 6, 5, 4, 3, 2, 1, 0)	2	$\mathbb{Z}_{109} : \mathbb{Z}_6, 2$	
	QSRG(109, 18, 2; 6, 4, 3, 2, 0)	1	$\mathbb{Z}_{109} : \mathbb{Z}_{18}$	
	QSRG(109, 24, 8; 8, 7, 6, 4, 3, 2)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 24, 8; 8, 7, 6, 5, 4, 3, 2)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 24, 2; 8, 7, 6, 3)	1	$\mathbb{Z}_{109} : \mathbb{Z}_{12}$	
	QSRG(109, 24, 2; 9, 8, 7, 6, 5, 4)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 24, 8; 8, 6, 4, 3, 2)	1	$\mathbb{Z}_{109} : \mathbb{Z}_{12}$	
	QSRG(109, 30, 8; 14, 10, 9, 8, 6, 5, 2)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 30, 8; 13, 11, 10, 9, 8, 7, 5, 4)	1	$\mathbb{Z}_{109} : \mathbb{Z}_6$	
	QSRG(109, 36, 11; 14, 10)	1	$\mathbb{Z}_{109} : \mathbb{Z}_{36}$	
	113	QSRD(113, 7, 0; 2, 1, 0)	1	$\mathbb{Z}_{113} : \mathbb{Z}_7$
		QSRD(113, 14, 0; 5, 4, 2, 1, 0)	1	$\mathbb{Z}_{113} : \mathbb{Z}_7$
QSRD(113, 14, 0; 2, 5, 4, 2, 1, 0)		1	$\mathbb{Z}_{113} : \mathbb{Z}_7$	
QSRD(113, 21, 0; 2, 10, 8, 6, 5, 4, 2, 1)		1	$\mathbb{Z}_{113} : \mathbb{Z}_7$	
QSRD(113, 21, 0; 4, 8, 6, 5, 4, 2, 1, 0)		1	$\mathbb{Z}_{113} : \mathbb{Z}_7$	
QSRD(113, 21, 0; 4, 7, 6, 5, 4, 2, 0)		1	$\mathbb{Z}_{113} : \mathbb{Z}_7$	
QSRD(113, 32, 32, 6; 12, 11, 10, 9, 8)		1	$\mathbb{Z}_{113} : \mathbb{Z}_{16}$	
QSRG(113, 80; 2, 1, 0)		1	$\mathbb{Z}_{113} : \mathbb{Z}_8$	
QSRG(113, 14, 0; 4, 3, 2, 0)		1	$\mathbb{Z}_{113} : \mathbb{Z}_{14}$	
QSRG(113, 16, 0; 5, 4, 2, 1, 0)		1	$\mathbb{Z}_{113} : \mathbb{Z}_8$	
QSRG(113, 16, 0; 8, 4, 2, 1, 0)		1	$\mathbb{Z}_{113} : \mathbb{Z}_8$	
QSRG(113, 16, 0; 5, 4, 2, 0)		1	$\mathbb{Z}_{113} : \mathbb{Z}_{16}$	
QSRG(113, 24, 8; 8, 6, 5, 4, 3, 2)		1	$\mathbb{Z}_{113} : \mathbb{Z}_8$	
QSRG(113, 24, 4; 8, 7, 6, 5, 4)		1	$\mathbb{Z}_{113} : \mathbb{Z}_8$	
QSRG(113, 24, 0; 13, 10, 8, 6, 5, 4, 3, 2)		1	$\mathbb{Z}_{113} : \mathbb{Z}_8$	
QSRG(113, 28, 6; 10, 9, 8, 6, 5, 4)	1	$\mathbb{Z}_{113} : \mathbb{Z}_{14}$		
QSRG(113, 28, 9; 8, 6, 4)	1	$\mathbb{Z}_{113} : \mathbb{Z}_{28}$		
QSRG(113, 42, 16; 17, 16, 15, 14, 13)	1	$\mathbb{Z}_{113} : \mathbb{Z}_{14}$		
117	QSRG(117, 12, 1; 3, 1, 0)	1	$PSL(3, 3) : \mathbb{Z}_2$	
	QSRG(117, 16, 7; 2, 1, 0)	1	$PSL(3, 3) : \mathbb{Z}_2$	
	QSRG(117, 16, 4; 4, 2, 0)	1	$PSL(3, 3) : \mathbb{Z}_2$	
	QSRG(117, 24, 4; 10, 6, 4, 3)	1	$PSL(3, 3) : \mathbb{Z}_2$	
	QSRG(117, 48, 19; 22, 21, 18, 16)	1	$PSL(3, 3) : \mathbb{Z}_2$	
	QSRG(117, 64, 34; 40, 36, 32)	1	$PSL(3, 3) : \mathbb{Z}_2$	
120	QSRG(120, 7, 0; 1, 0)	1	S_7	
	QSRG(120, 14, 1; 6, 2, 0)	1	S_7	
	QSRG(120, 14, 6; 2, 1, 0)	1	S_8	
	QSRG(120, 17, 0; 4, 2, 0)	1	$PSL(2, 16) : \mathbb{Z}_2$	
	QSRG(120, 17, 4; 4, 2, 0)	1	$PSL(2, 16)$	
	QSRG(120, 17, 0; 4, 2)	1	$PSL(2, 16) : \mathbb{Z}_4$	
	QSRG(120, 21, 2; 6, 3, 2)	1	S_7	
	QSRG(120, 21, 4; 4, 3)	1	$PSL(3, 4) : \mathbb{Z}_2^2$	
	QSRG(120, 21, 0; 6, 3)	1	S_8	
	QSRG(120, 21, 8; 4, 0)	1	3628800	
	QSRG(120, 28, 6; 12, 6, 4)	1	S_8	
	QSRG(120, 34, 12; 10, 2)	1	$PSL(2, 16) : \mathbb{Z}_4$	
	QSRG(120, 34, 10; 12, 10, 4)	1	$PSL(2, 16) : \mathbb{Z}_2$	
	QSRG(120, 35, 4; 20, 10)	1	3628800	
	QSRG(120, 35, 10; 12, 8)	1	S_7	
	QSRG(120, 42, 18; 15, 6)	1	S_8	
	QSRG(120, 42, 16; 16, 15, 14, 12, 6)	1	S_7	
	QSRG(120, 56, 25; 32, 24)	1	$PSL(3, 4) : \mathbb{Z}_2^2$	

Tablica 4.55: Grafovi dobiveni konstrukcijom iz primitivnih permutacijskih grupa stupnja $n \in \{109, \dots, 120\}$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)	
121	QSRD(121,5,0,0;2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_5$	
	QSRD(121,10,0,0;3,2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_5$	
	QSRD(121,10,10,0;2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_{10}$	
	QSRD(121,10,0,2;3,2,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : (\mathbb{Z}_5 \times D_5)$	
	QSRD(121,15,0,2;5,2,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : (\mathbb{Z}_5 \times S_3)$	
	QSRD(121,15,0,2;6,5,4,3,2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_5$	
	QSRD(121,15,0,2;6,3,2,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_5$	
	QSRD(121,15,10,0;6,4,3,2,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_5$	
	QSRD(121,15,10,0;6,4,3,2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_5$	
	QSRD(121,15,0,2;6,4,3,2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_5$	
	QSRD(121,15,10,2;5,4,2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_5$	
	QSRD(121,20,10,2;10,6,5,4,3,2,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_5$	
	QSRD(121,25,0,4;9,6,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : (\mathbb{Z}_5 \times D_5)$	
	QSRD(121,25,20,8;9,8,7,6,4,2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_5$	
	QSRD(121,25,10,4;10,9,6,5,4,3,2,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_5$	
	QSRD(121,30,0,6;11,10,6,4)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : \mathbb{Z}_{15}$	
	QSRD(121,30,0,8;12,8,6,5)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : (\mathbb{Z}_5 \times S_3)$	
	QSRD(121,30,20,8;14,12,10,9,8,6,5,4)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_5$	
	QSRG(121,62;2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_6$	
	QSRG(121,80;2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : QD_8$	
	QSRG(121,12,2;3,2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_6$	
	QSRG(121,12,2;2,1,0)	2	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : (\mathbb{Z}_3 : \mathbb{Z}_4), (\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_{12}$	
	QSRG(121,12,2;4,3,2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_6$	
	QSRG(121,16,0;5,4,3,2,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : \mathbb{Z}_8$	
	QSRG(121,16,0;4,3,2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : Q_4$	
	QSRG(121,16,0;8,4,2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : QD_8$	
	QSRG(121,18,2;5,4,3,2,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_6$	
	QSRG(121,18,2;6,4,3,2,1,0)	2	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_6$	
	QSRG(121,18,4;8,6,5,4,2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_6$	
	QSRG(121,18,2;6,4,3,2,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_6$	
	QSRG(121,18,4;6,4,3,2,1,0)	2	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_6$	
	QSRG(121,20,6;5,4,2,1,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_{10}$	
	QSRG(121,20,0;2;10,7,6,5,4,2,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_5$	
	QSRG(121,20,6;5,4,2,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : ((\mathbb{Z}_{10} \times \mathbb{Z}_2) : \mathbb{Z}_2)$	
	QSRG(121,20,0;7,6,4,3,2,0)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_{10}$	
	QSRG(121,24,2;8,7,6,4,3)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_{12}$	
	QSRG(121,24,4;8,7,6,5,4,2)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : Q_4$	
	QSRG(121,24,8;8,6,5,4,2,1)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_{12}$	
	QSRG(121,24,8;6,4,3,2)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : GL(2,3)$	
	QSRG(121,24,2;8,6,4,3)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : (\mathbb{Z}_{24} : \mathbb{Z}_2)$	
	QSRG(121,24,0;13,8,6,4,3,2)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : QD_8$	
	QSRG(121,24,4;8,6,5,4,2)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : QD_8$	
	QSRG(121,24,2;8,7,6,5,4,3,2)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_6$	
	QSRG(121,30,8;14,11,8,7,6,5,2)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_6$	
	QSRG(121,36,10;16,12,11,10,9,8)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : D_6$	
	QSRG(121,36,10;15,10,9,8)	1	$(\mathbb{Z}_{11} \times \mathbb{Z}_{11}) : (\mathbb{Z}_3 : \mathbb{Z}_4)$	
	125	QSRD(125,4,0,0;2,1,0)	1	$\mathbb{Z}_5^3 : S_4$
		QSRD(125,10,6,0;4,3,2,1,0)	1	$\mathbb{Z}_5^3 : S_4$
		QSRD(125,16,12,0;4,3,2,1,0)	1	$\mathbb{Z}_5^3 : A_4$
		QSRD(125,12,0,0;0,6,4,2,1)	1	$\mathbb{Z}_5^3 : S_4$
QSRD(125,16,0,0;0,6,4,2,1)		2	$\mathbb{Z}_5^3 : S_4, \mathbb{Z}_5^3 : ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_2)$	
QSRD(125,16,0,0;10,7,6,4,2,1)		1	$\mathbb{Z}_5^3 : S_4$	
QSRD(125,20,8,0;12,7,6,4,2,1,0)		1	$\mathbb{Z}_5^3 : S_4$	
QSRD(125,28,12,6;12,8,7,6,5,4,0)		1	$\mathbb{Z}_5^3 : A_4$	
QSRD(125,28,12,6;12,10,7,6,5,4,1)		1	$\mathbb{Z}_5^3 : A_4$	
QSRD(125,31,0,6;12,7,6)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_3 : \mathbb{Z}_3)$	
QSRG(125,60;2,1,0)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times S_4)$	
QSRG(125,80;4,2,1,0)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times S_4)$	
QSRG(125,12,3;2,0)		1	10368000	
QSRG(125,12,0;2,1,0)		1	$\mathbb{Z}_5^3 : (A_5 : \mathbb{Z}_4)$	
QSRG(125,12,4;4,2,1,0)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times S_4)$	
QSRG(125,18,2;7,4,2,1,0)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times A_4)$	
QSRG(125,14,0;6,5,2,1,0)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times S_4)$	
QSRG(125,16,3;4,2,0)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_4 \times S_4)$	
QSRG(125,20,6;4,1,0)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times S_5)$	
QSRG(125,20,0;6,5,4,2,1)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times A_4)$	
QSRG(125,24,3;6,4)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_4 \times S_5)$	
QSRG(125,24,7;6,4,2,0)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_4 \times S_4)$	
QSRG(125,24,2;8,6,5,4,0)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times S_4)$	
QSRG(125,30,4;10,9,6)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times S_5)$	
QSRG(125,32,6;10,8,7)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_2 \times ((\mathbb{Z}_4^2 : \mathbb{Z}_3) : \mathbb{Z}_2))$	
QSRG(125,40,9;16,10)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_4 \times S_5)$	
QSRG(125,48,17;24,18)		1	10368000	
QSRG(125,48,17;28,20,18,12)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_4 \times S_4)$	
QSRG(125,60,31;30,24)		1	$\mathbb{Z}_5^3 : (\mathbb{Z}_4 \times S_5)$	
QSRG(125,64,27;48,36)		1	10368000	

Tablica 4.56: Grafovi dobiveni konstrukcijom iz primitivnih permutacijskih grupa stupnja $n \in \{121, \dots, 125\}$

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
126	QSRG(126,50;1,0)	1	S_9
	QSRG(126,20,7;4,0)	1	S_9
	QSRG(126,40,9;18,14,0)	1	S_9
	QSRG(126,60,28;36,30,27)	1	S_9
127	QSRD(127,7,0,1;2,0)	1	$\mathbb{Z}_{127} : \mathbb{Z}_7$
	QSRD(127,9,0,0;3,2,0)	1	$\mathbb{Z}_{127} : \mathbb{Z}_9$
	QSRD(127,14,0,3;4,2,0)	1	$\mathbb{Z}_{127} : \mathbb{Z}_7$
	QSRD(127,14,0,1;4,2,0)	3	$\mathbb{Z}_{127} : \mathbb{Z}_7$
	QSRD(127,18,0,2;5,4,2,0)	1	$\mathbb{Z}_{127} : \mathbb{Z}_9$
	QSRD(127,18,0,2;7,5,4,2,0)	1	$\mathbb{Z}_{127} : \mathbb{Z}_9$
	QSRD(127,21,0,5;6,4,2,0,8)	1	$\mathbb{Z}_{127} : \mathbb{Z}_7$
	QSRD(127,21,0,3;6,4,2,0)	1	$\mathbb{Z}_{127} : \mathbb{Z}_7$
	QSRD(127,21,0,3;8,6,4,2,0)	2	$\mathbb{Z}_{127} : \mathbb{Z}_7$
	QSRD(127,21,0,3;10,6,4,2,0)	1	$\mathbb{Z}_{127} : \mathbb{Z}_7$
	QSRD(127,21,0,1;8,4,2)	1	$\mathbb{Z}_{127} : \mathbb{Z}_{21}$
	QSRD(127,28,0,7;12,8,6,4,2,0)	1	$\mathbb{Z}_{127} : \mathbb{Z}_7$
	QSRD(127,28,0,5;14,10,8,6,4)	1	$\mathbb{Z}_{127} : \mathbb{Z}_7$
	QSRD(127,28,0,5;12,10,8,6,4,2)	1	$\mathbb{Z}_{127} : \mathbb{Z}_7$
	QSRD(127,42,0,13;18,16,14,10)	1	$\mathbb{Z}_{127} : \mathbb{Z}_{21}$
	QSRG(127,14,3;4,2,0)	1	$\mathbb{Z}_{127} : \mathbb{Z}_{14}$
	QSRG(127,18,2;5,4,2,0)	1	$\mathbb{Z}_{127} : \mathbb{Z}_{18}$
	QSRG(127,28,9;8,6,4,2)	1	$\mathbb{Z}_{127} : \mathbb{Z}_{14}$
	QSRG(127,28,3;10,8,6,4)	1	$\mathbb{Z}_{127} : \mathbb{Z}_{14}$
	QSRG(127,36,8;15,12,11,10,6)	1	$\mathbb{Z}_{127} : \mathbb{Z}_{18}$
	QSRG(127,42,15;18,14,12,10)	1	$\mathbb{Z}_{127} : \mathbb{Z}_{14}$
QSRG(127,42,11;16,14)	1	$\mathbb{Z}_{127} : \mathbb{Z}_{42}$	
DRT(127,63,31,32)	1	$\mathbb{Z}_{127} : \mathbb{Z}_{63}$	
131	QSRD(131,13,0,2;4,2,1,0)	1	$\mathbb{Z}_{131} : \mathbb{Z}_{13}$
	QSRG(131,10,0;2,1,0)	1	$\mathbb{Z}_{131} : \mathbb{Z}_{10}$
	QSRG(131,20,0;7,6,4,2,1,0)	1	$\mathbb{Z}_{131} : \mathbb{Z}_{10}$
	QSRG(131,20,6;4,3,2,1,0)	1	$\mathbb{Z}_{131} : \mathbb{Z}_{10}$
	QSRG(131,20,0;6,4,3,2,0)	1	$\mathbb{Z}_{131} : \mathbb{Z}_{10}$
	QSRG(131,26,6;8,5,4,2)	1	$\mathbb{Z}_{131} : \mathbb{Z}_{26}$
	QSRG(131,30,6;7,10,9,8,6,4,2)	1	$\mathbb{Z}_{131} : \mathbb{Z}_{10}$
	QSRG(131,30,8;8,7,6,4)	1	$\mathbb{Z}_{131} : \mathbb{Z}_{10}$
DRT(131,65,32,33)	1	$\mathbb{Z}_{131} : \mathbb{Z}_{65}$	
135	QSRG(135,14,1;3,0)	1	1451520
	QSRG(135,56,28;21,12)	1	1451520
136	QSRD(136,9,0,0;4,1,0)	1	$PSL(2, 17)$
	QSRD(136,27,18,6;9,6,5,4,2)	1	$PSL(2, 17)$
	QSRG(136,9,2;2,1,0)	2	$PSL(2, 17)$
	QSRG(136,9,0;1,0)	1	$PSL(2, 17) : \mathbb{Z}_2$
	QSRG(136,15,0;4,2,1,0)	1	$PSL(2, 16)$
	QSRG(136,15,4;2,1,0)	1	$PSL(2, 16) : \mathbb{Z}_4$
	QSRG(136,15,4;4,2,1,0)	1	$PSL(2, 16) : \mathbb{Z}_2$
	QSRG(136,18,2;4,3,2,0)	2	$PSL(2, 17) : \mathbb{Z}_2$
	QSRG(136,18,4;4,3,2,0)	1	$PSL(2, 17) : \mathbb{Z}_2$
	QSRG(136,18,1;4,2,0)	1	$PSL(2, 17) : \mathbb{Z}_2$
	QSRG(136,18,0;4,3,2,0)	1	$PSL(2, 17) : \mathbb{Z}_2$
	QSRG(136,18,2;4,2,1,0)	1	$PSL(2, 17) : \mathbb{Z}_2$
	QSRG(136,18,4;4,2,0)	1	$PSL(2, 17) : \mathbb{Z}_2$
	QSRG(136,30,6;12,6,4)	1	$PSL(2, 16) : \mathbb{Z}_2$
	QSRG(136,30,4;14,6)	1	$PSL(2, 16) : \mathbb{Z}_4$
	QSRG(136,36,8;14,12,9,8)	1	$PSL(2, 17) : \mathbb{Z}_2$
	QSRG(136,36,8;12,8)	1	$PSL(2, 17) : \mathbb{Z}_2$
	QSRG(136,36,10;14,10,9,8)	1	$PSL(2, 17) : \mathbb{Z}_2$
QSRG(136,36,8;13,11,10,7,6)	1	$PSL(2, 17)$	
QSRG(136,45,18;15,12)	1	$PSL(2, 16) : \mathbb{Z}_4$	
137	QSRD(137,17,0,4;4,3,2,0)	1	$\mathbb{Z}_{137} : \mathbb{Z}_{17}$
	QSRG(137,80;2,1,0)	1	$\mathbb{Z}_{137} : \mathbb{Z}_8$
	QSRG(137,16,0;8,4,3,2,1,0)	1	$\mathbb{Z}_{137} : \mathbb{Z}_8$
	QSRG(137,16,0;4,3,2,0)	1	$\mathbb{Z}_{137} : \mathbb{Z}_8$
	QSRG(137,16,0;4,2,1,0)	1	$\mathbb{Z}_{137} : \mathbb{Z}_8$
	QSRG(137,16,0;5,4,3,2,0)	1	$\mathbb{Z}_{137} : \mathbb{Z}_8$
	QSRG(137,24,8;8,6,4,3,2,0)	1	$\mathbb{Z}_{137} : \mathbb{Z}_8$
	QSRG(137,24,0;10,8,7,6,4,3,2)	1	$\mathbb{Z}_{137} : \mathbb{Z}_8$
	QSRG(137,24,2;7,6,4,2,0)	1	$\mathbb{Z}_{137} : \mathbb{Z}_8$
	QSRG(137,32,6;11,10,9,8,7,6)	1	$\mathbb{Z}_{137} : \mathbb{Z}_8$
	QSRG(137,34,12;8,7,6)	1	$\mathbb{Z}_{137} : \mathbb{Z}_{34}$
	QSRG(137,40,12;17,15,12,10,9,8,7)	1	$\mathbb{Z}_{137} : \mathbb{Z}_8$

Tablica 4.57: Grafovi dobiveni konstrukcijom iz primitivnih permutacijskih grupa stupnja $n \in \{126, \dots, 137\}$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
139	QSRD(139,23,0,4;6,4,3,0)	1	$\mathbb{Z}_{139} : \mathbb{Z}_{23}$
	QSRG(139,46,12;17,16)	1	$\mathbb{Z}_{139} : \mathbb{Z}_{46}$
	DRT(139,69,34,35)	1	$\mathbb{Z}_{139} : \mathbb{Z}_{69}$
144	QSRD(144,11,0,0;5,1,0)	1	M_{12}
	QSRD(144,13,0,0;4,3,1,0)	1	$PSL(3,3)$
	QSRD(144,13,0,0;6,1,0)	1	$PSL(3,3)$
	QSRG(144,13,0;3,2,0)	1	$PSL(3,3) : \mathbb{Z}_2$
	QSRG(144,22,5;4,2)	1	$M_{12} : \mathbb{Z}_2$
	QSRG(144,26,4;6,4,3)	1	$PSL(3,3) : \mathbb{Z}_2$
	QSRG(144,26,6;7,6,2,0)	1	$PSL(3,3) : \mathbb{Z}_2$
	QSRG(144,39,39,10;12,9,6)	1	$PSL(3,3) : \mathbb{Z}_2$
QSRG(144,55,55,24;20,15)	1	$M_{12} : \mathbb{Z}_2$	
149	QSRD(149,37,0,8;12,11,6)	1	$\mathbb{Z}_{149} : \mathbb{Z}_{37}$
151	QSRD(151,15,0,1;4,2,0)	1	$\mathbb{Z}_{151} : \mathbb{Z}_{15}$
	QSRD(151,25,0,4;7,6,4,2)	1	$\mathbb{Z}_{151} : \mathbb{Z}_{25}$
	QSRD(151,30,0,5;12,10,6,4)	1	$\mathbb{Z}_{151} : \mathbb{Z}_{15}$
	QSRG(151,10,0;2,1,0)	1	$\mathbb{Z}_{151} : \mathbb{Z}_{10}$
	QSRG(151,20,0;6,4,3,2,0)	1	$\mathbb{Z}_{151} : \mathbb{Z}_{10}$
	QSRG(151,20,0;7,4,3,2,0)	1	$\mathbb{Z}_{151} : \mathbb{Z}_{10}$
	QSRG(151,20,6;4,3,2,1,0)	1	$\mathbb{Z}_{151} : \mathbb{Z}_{10}$
	QSRG(151,20,0;7,6,4,2,1,0)	1	$\mathbb{Z}_{151} : \mathbb{Z}_{10}$
	QSRG(151,30,2;10,9,8,7,6,4,2)	1	$\mathbb{Z}_{151} : \mathbb{Z}_{10}$
	QSRG(151,30,8;10,8,6,5,4,3,2)	1	$\mathbb{Z}_{151} : \mathbb{Z}_{10}$
	QSRG(151,30,8;10,6,5,4,3,2)	1	$\mathbb{Z}_{151} : \mathbb{Z}_{10}$
	QSRG(151,30,5;8,6,4)	1	$\mathbb{Z}_{151} : \mathbb{Z}_{30}$
	QSRG(151,50,18;17,14)	1	$\mathbb{Z}_{151} : \mathbb{Z}_{50}$
DRT(151,75,37,38)	1	$\mathbb{Z}_{151} : \mathbb{Z}_{75}$	
153	QSRD(153,8,0,0;2,1,0)	2	$PSL(2,17)$
	QSRD(153,24,16,4;6,4,3,2,0)	1	$PSL(2,17)$
	QSRD(153,40,32,8;18,14,13,12,10,8)	1	$PSL(2,17)$
	QSRD(153,56,48,22;24,21,20,18,12)	1	$PSL(2,17)$
	QSRG(153,41;1,0)	1	$PSL(2,17)$
	QSRG(153,81;1,0)	1	$PSL(2,17) : \mathbb{Z}_2$
	QSRG(153,80;2,1,0)	1	$PSL(2,17)$
	QSRG(153,16,4;4,1,0)	1	$PSL(2,17)$
	QSRG(153,16,0;4,2,1,0)	2	$PSL(2,17) : \mathbb{Z}_2$
	QSRG(153,16,2;4,3,2,1,0)	1	$PSL(2,17) : \mathbb{Z}_2$
	QSRG(153,16,4;4,2,1,0)	1	$PSL(2,17) : \mathbb{Z}_2$
	QSRG(153,16,2;4,2,1,0)	2	$PSL(2,17) : \mathbb{Z}_2$
	QSRG(153,16,3;4,2,1,0)	1	$PSL(2,17) : \mathbb{Z}_2$
	QSRG(153,20,5;5,4,3,2,1,0)	1	$PSL(2,17)$
	QSRG(153,24,4;14,6,5,4,2,1,0)	1	$PSL(2,17)$
	QSRG(153,32,7;12,8,7,6,5,4)	1	$PSL(2,17)$
	QSRG(153,32,6;8,7,6,2)	1	$PSL(2,17) : \mathbb{Z}_2$
	QSRG(153,32,8;8,7,6,4,2)	1	$PSL(2,17) : \mathbb{Z}_2$
	QSRG(153,32,8;8,6,4)	1	$PSL(2,17) : \mathbb{Z}_2$
	QSRG(153,36,9;13,12,10,9,8,7,6,5,4)	1	$PSL(2,17)$
QSRG(153,44,15;16,14,12,10,8,4)	1	$PSL(2,17)$	
157	QSRD(157,13,0,0;4,2,1,0)	1	$\mathbb{Z}_{157} : \mathbb{Z}_{13}$
	QSRD(157,26,0,4;8,6,5,4,3,2)	1	$\mathbb{Z}_{157} : \mathbb{Z}_{13}$
	QSRD(157,26,0,4;8,7,6,5,4,2)	1	$\mathbb{Z}_{157} : \mathbb{Z}_{13}$
	QSRD(157,39,0,8;14,10,7)	1	$\mathbb{Z}_{157} : \mathbb{Z}_{39}$
	QSRG(157,12,2;2,1,0)	1	$\mathbb{Z}_{157} : \mathbb{Z}_{12}$
	QSRG(157,24,2;6,5,4,3,2,0)	1	$\mathbb{Z}_{157} : \mathbb{Z}_{12}$
	QSRG(157,24,2;7,6,4,3,2)	1	$\mathbb{Z}_{157} : \mathbb{Z}_{12}$
	QSRG(157,24,8;6,4,3,2,1,0)	1	$\mathbb{Z}_{157} : \mathbb{Z}_{12}$
	QSRG(157,24,2;6,4,3,2,1)	1	$\mathbb{Z}_{157} : \mathbb{Z}_{12}$
	QSRG(157,26,0;8,6,5,4,2)	1	$\mathbb{Z}_{157} : \mathbb{Z}_{26}$
	QSRG(157,36,8;12,11,10,8,7,6,4,3)	1	$\mathbb{Z}_{157} : \mathbb{Z}_{12}$
	QSRG(157,36,4;16,12,10,9,8,7,6)	1	$\mathbb{Z}_{157} : \mathbb{Z}_{12}$
	QSRG(157,36,6;14,13,10,9,8,6,5)	1	$\mathbb{Z}_{157} : \mathbb{Z}_{12}$
QSRG(157,52,15;20,16)	1	$\mathbb{Z}_{157} : \mathbb{Z}_{152}$	
163	QSRD(163,9,0,0;2,1,0)	1	$\mathbb{Z}_{163} : \mathbb{Z}_9$
	QSRD(163,18,0,0;6,4,3,2,1,0)	1	$\mathbb{Z}_{163} : \mathbb{Z}_9$
	QSRD(163,27,0,4;8,6,5,2)	1	$\mathbb{Z}_{163} : \mathbb{Z}_{27}$
	QSRD(163,45,0,14;21,19,14,13,11,10,8)	1	$\mathbb{Z}_{163} : \mathbb{Z}_9$
	QSRG(163,18,2;4,3,2,0)	1	$\mathbb{Z}_{163} : \mathbb{Z}_{18}$
	QSRG(163,36,8;11,10,8,7,4)	1	$\mathbb{Z}_{163} : \mathbb{Z}_{18}$
	QSRG(163,54,20;17,16)	1	$\mathbb{Z}_{163} : \mathbb{Z}_{54}$
DRT(163,81,40,41)	1	$\mathbb{Z}_{163} : \mathbb{Z}_{81}$	

Tablica 4.58: Grafovi dobiveni konstrukcijom iz primitivnih permutacijskih grupa stupnja $n \in \{139, \dots, 163\}$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
165	QSRD(165,24,0,2;6,5,4,3,1,0)	2	M_{11}, M_{11}
	QSRD(165,48,24,15;15,14,13,12)	2	M_{11}, M_{11}
	QSRG(165,81;1,0)	1	M_{11}
	QSRG(165,12,1;3,1,0)	1	M_{11}
	QSRG(165,24,9;4,0)	1	39916800
	QSRG(165,24,0;12,6,5,2)	1	M_{11}
	QSRG(165,48,14;20,18,14,8)	1	M_{11}
	QSRG(165,48,7;25,16,15,14,9)	1	M_{11}
	QSRG(165,56,10;35,20)	1	39916800
	QSRG(165,84,39;49,45)	1	39916800
167	DRT(167,83,41,42)	1	$\mathbb{Z}_{167} : \mathbb{Z}_83$
168	QSRD(168,24,0,1;9,8,3,0)	1	$(PSL(3,2) \times PSL(3,2)) : \mathbb{Z}_2$
	QSRG(168,21,4;4,3,0)	1	$(PSL(3,2) \times PSL(3,2)) : \mathbb{Z}_2^2$
	QSRG(168,42,16;12,7,2)	1	$(PSL(3,2) \times PSL(3,2)) : \mathbb{Z}_2^2$
	QSRG(168,48,12;16,12)	1	$(PSL(3,2) \times PSL(3,2)) : \mathbb{Z}_2^2$
	QSRG(168,56,19;21,16)	1	$(PSL(3,2) \times PSL(3,2)) : \mathbb{Z}_2^2$
169	QSRG(168,63,22;27,21)	1	$(PSL(3,2) \times PSL(3,2)) : \mathbb{Z}_2^2$
	QSRD(169,6,0,0;2,1,0)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times S_3)$
169	QSRD(169,7,0,0;2,1,0)	1	$\mathbb{Z}_{13}^2 : D_7$
	QSRD(169,9,0,0;4,2,1,0)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times S_3)$
	QSRD(169,14,0,0;4,2,1,0)	1	$\mathbb{Z}_{13}^2 : D_7$
	QSRD(169,14,0,0;5,4,2,1,0)	1	$\mathbb{Z}_{13}^2 : D_7$
	QSRD(169,15,0,0;8,6,2,1,0)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times S_3)$
	QSRD(169,18,0,2;4,2,1,0)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times S_3)$
	QSRD(169,21,0,0;8,4,2,1)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times D_7)$
	QSRD(169,21,14,2;6,5,4,2,1,0)	1	$\mathbb{Z}_{13}^2 : D_7$
	QSRD(169,21,14,0;86,5,4,3,2,0)	1	$\mathbb{Z}_{13}^2 : D_7$
	QSRD(169,21,14,0;6,4,3,2,0)	1	$\mathbb{Z}_{13}^2 : D_7$
	QSRD(169,27,0,2;14,8,6,5,3,2,0)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times S_3)$
	QSRD(169,27,18,6;6,5,4,2,1,0)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times S_3)$
	QSRD(169,27,0,4;6,3,0)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times S_3)$
	QSRD(169,33,0,6;12,10,8,6,3,1)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times S_3)$
	QSRD(169,33,0,6;13,10,8,6,5,4,1)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times S_3)$
	QSRD(169,33,0,6;11,10,8,7,6,4,1)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times S_3)$
	QSRD(169,35,28,6;12,10,9,8,7,6,4)	1	$\mathbb{Z}_{13}^2 : D_7$
	QSRD(169,35,28,8;12,11,9,8,6,5,4,2)	1	$\mathbb{Z}_{13}^2 : D_7$
	QSRD(169,36,18,8;12,11,8,7,6,4,2,0)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times S_3)$
	QSRD(169,57,30,20;29,27,26,25,17,16,15,12,8)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times S_3)$
	QSRG(169,8,0;2,1,0)	2	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_4^2 : \mathbb{Z}_2), \mathbb{Z}_{13}^2 : \overline{SL}(2,3)$
	QSRG(169,12,2;3,2,0)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times ((\mathbb{Z}_{66} \times \mathbb{Z}_2) : \mathbb{Z}_2))$
	QSRG(169,12,2;2,1,0)	3	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_4 \times S_3), \mathbb{Z}_{13}^2 : ((\mathbb{Z}_{66} \times \mathbb{Z}_2) : \mathbb{Z}_2), \mathbb{Z}_{13}^2 : D_{12}$
	QSRG(169,14,0;2,1,0)	1	$\mathbb{Z}_{13}^2 : D_{14}$
	QSRG(169,16,0;8,4,3,2,1,0)	1	$\mathbb{Z}_{13}^2 : \overline{SL}(2,3)$
	QSRG(169,16,0;8,4,2,1,0)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_4^2 : \mathbb{Z}_2)$
	QSRG(169,16,0;2,1,0)	1	$\mathbb{Z}_{13}^2 : (((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3)$
	QSRG(169,16,0;4,3,2,0)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_8 : \mathbb{Z}_2)$
	QSRG(169,18,4;6,3,2,0)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_{66} \times S_3)$
QSRG(169,24,8;6,3,2,0)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times \overline{SL}(2,3))$	
QSRG(169,24,2;8,7,4,3,2)	1	$\mathbb{Z}_{13}^2 : ((\mathbb{Z}_{66} \times \mathbb{Z}_2) : \mathbb{Z}_2)$	
QSRG(169,24,8;6,2,1)	1	$\mathbb{Z}_{13}^2 : \overline{SL}(2,3) : \mathbb{Z}_4$	
QSRG(169,24,4;9,4,3,2)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_4^2 : \mathbb{Z}_2)$	
QSRG(169,24,6;6,4,3,2,0)	1	$\mathbb{Z}_{13}^2 : (((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3)$	
QSRG(169,24,0;8,7,6,4,3,2,0)	1	$\mathbb{Z}_{13}^2 : ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$	
QSRG(169,24,0;7,6,5,4,2,0)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_8 : \mathbb{Z}_2)$	
QSRG(169,24,2;8,6,4,3,2,0)	2	$\mathbb{Z}_{13}^2 : ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2), \mathbb{Z}_{13}^2 : (\mathbb{Z}_8 : \mathbb{Z}_2)$	
QSRG(169,24,2;6,4,2,1)	1	$\mathbb{Z}_{13}^2 : ((\mathbb{Z}_{12} \times \mathbb{Z}_2) : \mathbb{Z}_2)$	
QSRG(169,24,2;6,5,4,2,1,0)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_8 : \mathbb{Z}_2)$	
QSRG(169,24,8;6,4,3,2,1,0)	1	$\mathbb{Z}_{13}^2 : D_{12}$	
QSRG(169,24,2;6,5,4,3,2,0)	2	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 : \mathbb{Z}_4)$	
QSRG(169,24,2;8,7,6,4,2,1,0)	1	$\mathbb{Z}_{13}^2 : D_{12}$	
QSRG(169,24,2;8,5,4,2)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times D_8)$	
QSRG(169,28,6;7,4,2)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_4 \times D_7)$	
QSRG(169,28,6;8,7,6,4,2,1,0)	1	$\mathbb{Z}_{13}^2 : D_{14}$	
QSRG(169,28,0;8,7,6,5,4,2)	1	$\mathbb{Z}_{13}^2 : D_{14}$	
QSRG(169,32,0;14,9,8,7,6,4)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_8 : \mathbb{Z}_2)$	
QSRG(169,32,6;12,8,6,5,4,2)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_4^2 : \mathbb{Z}_2)$	
QSRG(169,36,4;18,12,9,6)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times ((\mathbb{Z}_{66} \times \mathbb{Z}_2) : \mathbb{Z}_2))$	
QSRG(169,36,10;10,7,6,4)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times D_{12})$	
QSRG(169,36,4;12,9,8,6)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 \times D_8)$	
QSRG(169,36,10;10,9,7,6,5,4)	1	$\mathbb{Z}_{13}^2 : ((\mathbb{Z}_{66} \times \mathbb{Z}_2) : \mathbb{Z}_2)$	

Tablica 4.59: Grafovi dobiveni konstrukcijom iz primitivnih permutacijskih grupa stupnja $n \in \{165, \dots, 169\}$

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})	
169	QSRG(169,36,10;11,10,9,6,5,4)	1	$\mathbb{Z}_{13}^2 : D_{12}$	
	QSRG(169,36,8;14,10,8,7,6,5)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_4 \times S_3)$	
	QSRG(169,36,6;16,13,12,8,6,4,3)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_4 \times S_3)$	
	QSRG(169,36,6;14,12,11,10,8,7,6,1)	1	$\mathbb{Z}_{13}^2 : D_{12}$	
	QSRG(169,36,8;13,9,8,7,6,4)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 : \mathbb{Z}_4)$	
	QSRG(169,36,10;12,10,8,7,6,5,4,2)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 : \mathbb{Z}_4)$	
	QSRG(169,36,8;14,10,9,8,6,5,4)	1	$\mathbb{Z}_{13}^2 : ((\mathbb{Z}_{66} \times \mathbb{Z}_2) : \mathbb{Z}_2)$	
	QSRG(169,36,8;12,9,8,6,5,4,1)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 : \mathbb{Z}_4)$	
	QSRG(169,36,6;5,6,7,8,10,12)	1	$\mathbb{Z}_{13}^2 : ((\mathbb{Z}_{66} \times \mathbb{Z}_2) : \mathbb{Z}_2)$	
	QSRG(169,36,4;16,12,10,9,8,6,5)	1	$\mathbb{Z}_{13}^2 : ((\mathbb{Z}_{66} \times \mathbb{Z}_2) : \mathbb{Z}_2)$	
	QSRG(169,40,12;13,12,10,9,8,7,6)	1	$\mathbb{Z}_{13}^2 : SL(2,3)$	
	QSRG(169,40,12;12,10,9,8,7,6)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_4^2 : \mathbb{Z}_2)$	
	QSRG(169,42,8;14,11,8)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_{66} \times D_7)$	
	QSRG(169,42,8;14,13,12,9,8,7)	1	$\mathbb{Z}_{13}^2 : D_{14}$	
	QSRG(169,42,12;17,12,11,10,8,7,6,4)	1	$\mathbb{Z}_{13}^2 : D_{14}$	
	QSRG(169,48,14;16,13,11,10)	1	$\mathbb{Z}_{13}^2 : SL(2,3)$	
	QSRG(169,48,14;16,12,11)	2	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_3 : \mathbb{Z}_8), \mathbb{Z}_{13}^2 : (\mathbb{Z}_3 : (\mathbb{Z}_4^2 : \mathbb{Z}_2))$	
	QSRG(169,48,14;18,16,15,14,13,12,10,7)	1	$\mathbb{Z}_{13}^2 : ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)$	
	QSRG(169,48,14;23,17,16,12,11,10)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_4 \times S_3)$	
	QSRG(169,48,16;18,15,12,11,10,6)	1	$\mathbb{Z}_{13}^2 : SL(2,3)$	
QSRG(169,54,16;24,21,18,15,12)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_{66} \times S_3)$		
QSRG(169,56,18;21,16)	1	$\mathbb{Z}_{13}^2 : (\mathbb{Z}_7 : (\mathbb{Z}_8 : \mathbb{Z}_2))$		
171	QSRD(171,5,0,0;1,0)	1	$PSL(2,19)$	
	QSRD(171,10,0,0;2,1,0)	1	$PSL(2,19)$	
	QSRD(171,10,0,0;4,2,1,0)	1	$PSL(2,19)$	
	QSRD(171,15,0,0;5,3,2,1,0)	1	$PSL(2,19)$	
	QSRD(171,15,10,2;3,2,1,0)	2	$PSL(2,19)$	
	QSRD(171,20,10,2;4,3,2,1,0)	2	$PSL(2,19)$	
	QSRD(171,20,0,2;6,4,3,2,1,0)	1	$PSL(2,19)$	
	QSRD(171,25,20,4;7,4,3,2,1)	1	$PSL(2,19)$	
	QSRD(171,30,20,6;12,10,6,5,4,3,2)	1	$PSL(2,19)$	
	QSRD(171,30,20,4;12,10,8,6,5,4,2)	1	$PSL(2,19)$	
	QSRD(171,45,20,12;13,12,11,9)	2	$PSL(2,19)$	
	QSRD(171,50,40,16;16,15,14,12,9)	1	$PSL(2,19)$	
	QSRD(171,50,40,14;20,18,15,13,11,10)	1	$PSL(2,19)$	
	QSRG(171,10,1;1,0)	1	$PSL(2,19) : \mathbb{Z}_2$	
	QSRG(171,10,4;1,0)	1	$PSL(2,19)$	
	QSRG(171,10,2;2,1,0)	1	$PSL(2,19)$	
	QSRG(171,20,1;4,2,0)	1	$PSL(2,19) : \mathbb{Z}_2$	
	QSRG(171,20,3;6,5,3,2,1,0)	1	$PSL(2,19)$	
	QSRG(171,20,4;4,2,1,0)	1	$PSL(2,19) : \mathbb{Z}_2$	
	QSRG(171,20,6;5,2,1,0)	1	$PSL(2,19)$	
	QSRG(171,20,2;4,2,1,0)	2	$PSL(2,19) : \mathbb{Z}_2$	
	QSRG(171,20,4;4,3,2,0)	1	$PSL(2,19) : \mathbb{Z}_2$	
	QSRG(171,20,2;4,3,2,0)	2	$PSL(2,19) : \mathbb{Z}_2, PSL(2,19) : \mathbb{Z}_2$	
	QSRG(171,20,0;4,3,2,0)	1	$PSL(2,19) : \mathbb{Z}_2$	
	QSRG(171,30,1;9,8,7,6,3,2)	1	$PSL(2,19) : \mathbb{Z}_2$	
	QSRG(171,30,5;7,6,5,4,2)	1	$PSL(2,19) : \mathbb{Z}_2$	
	QSRG(171,30,6;8,6,5,4)	1	$PSL(2,19)$	
	QSRG(171,30,4;7,6,4,3,2)	1	$PSL(2,19)$	
	QSRG(171,30,5;7,6,5,4,3,1)	1	$PSL(2,19)$	
	QSRG(171,40,10;12,11,10,8,5)	1	$PSL(2,19) : \mathbb{Z}_2$	
	QSRG(171,40,9;12,10,6,4)	1	$PSL(2,19) : \mathbb{Z}_2$	
	QSRG(171,40,8;13,12,10,7,6)	1	$PSL(2,19) : \mathbb{Z}_2$	
	QSRG(171,40,8;13,12,11,10,8,6,4)	1	$PSL(2,19) : \mathbb{Z}_2$	
	QSRG(171,40,6;16,12,11,10,8,7)	1	$PSL(2,19) : \mathbb{Z}_2$	
	QSRG(171,40,8;12,10,8,4)	1	$PSL(2,19) : \mathbb{Z}_2$	
	QSRG(171,80,37;40,38,32)	1	$PSL(2,19) : \mathbb{Z}_2$	
	173	QSRD(173,43,0,12;13,12,6)	1	$\mathbb{Z}_{173} : \mathbb{Z}_{43}$
	175	QSRG(175,12,5;1,0)	1	$PSU(3,5) : \mathbb{Z}_2$
		QSRG(175,28,3;7,4,3)	1	$PSL(2,49) : \mathbb{Z}_2$
		QSRG(175,42,9;12,7)	1	$PSL(2,49) : \mathbb{Z}_2$
QSRG(175,48,12;16,12)		1	$PSL(2,49) : \mathbb{Z}_2$	
QSRG(175,56,12;26,21,16)		1	$PSL(2,49) : \mathbb{Z}_2$	
QSRG(175,84,41;42,36)		1	$PSL(2,49) : \mathbb{Z}_2$	
QSRG(175,90,49;60,40)	1	$PSU(3,5) : \mathbb{Z}_2$		
179	DRT(179,89,44,45)	1	$\mathbb{Z}_{179} : \mathbb{Z}_{89}$	

Tablica 4.60: Grafovi dobiveni konstrukcijom iz primitivnih permutacijskih grupa stupnja $n \in \{169, \dots, 181\}$

Stupanj	Parametri	# neizom.	Aut(\mathcal{G}) ili Aut(\mathcal{G})
181	QSRD(181,15,0,0;4,3,2,0)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{15}$
	QSRD(181,45,0,12;15,10,8)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{45}$
	QSRG(181,10,0;2,1,0)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{10}$
	QSRG(181,12,2;2,1,0)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{12}$
	QSRG(181,18,2;2,1,0)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{18}$
	QSRG(181,20,6;4,3,2,1,0)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{10}$
	QSRG(181,20,0;4,3,2,0)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{10}$
	QSRG(181,20,0;6,2,1,0)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{10}$
	QSRG(181,20,0;5,4,3,2,0)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{10}$
	QSRG(181,20,0;4,2,1,0)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{20}$
	QSRG(181,24,8;6,4,3,2,1,0)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{12}$
	QSRG(181,24,2;6,5,4,3,2,0)	2	$\mathbb{Z}_{181} : \mathbb{Z}_{12}$
	QSRG(181,24,2;6,4,3,2,1,0)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{12}$
	QSRG(181,30,10;7,6,5,4,2,0)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{10}$
	QSRG(181,30,4;7,6,5,4,2)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{10}$
	QSRG(181,30,0;10,8,7,6,4,3,2)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{10}$
	QSRG(181,30,2;8,6,5,4,3,2)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{10}$
	QSRG(181,30,2;8,7,6,5,4,1)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{10}$
	QSRG(181,30,2;8,7,6,5,4,3,2)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{10}$
	QSRG(181,30,0;13,12,10,6,4,3,1,0)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{10}$
	QSRG(181,30,2;7,6,2)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{30}$
	QSRG(181,36,8;9,8,7,6,4,2)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{12}$
	QSRG(181,36,8;10,9,8,5,4)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{18}$
	QSRG(181,36,2;10,9,8,7,4)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{12}$
	QSRG(181,36,8;10,9,8,6,4)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{18}$
	QSRG(181,36,4;15,12,8,7,6,5,4)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{12}$
	QSRG(181,36,8;10,8,6,3)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{36}$
	QSRG(181,40,12;12,10,9,8,7,6,5)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{10}$
	QSRG(181,48,14;16,15,14,12,11,10,8,7)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{12}$
	QSRG(181,54,14;22,19,16,14,13)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{18}$
	QSRG(181,60,22;20,19,18,16)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{20}$
	QSRG(181,60,20;22,17)	1	$\mathbb{Z}_{181} : \mathbb{Z}_{60}$
	186	QSRG(186,10,4;1,0)	1
QSRG(186,50,5;20,16)		1	744000
QSRG(186,125,84;100,80)		1	744000
190	QSRD(190,9,0,0;3,1,0)	1	$PSL(2, 19)$
	QSRD(190,9,0,0;2,1,0)	1	$PSL(2, 19)$
	QSRD(190,18,9,2;5,4,3,2,1,0)	2	$PSL(2, 19)$
	QSRD(190,18,9,2;3,2,1,0)	4; $PSL(2, 19)$	
	QSRD(190,18,0,4;6,2,1,0)	1	$PSL(2, 19)$
	QSRD(190,18,9,0;4,3,2,1,0)	1	$PSL(2, 19)$
	QSRD(190,36,27,8;9,8,7,6,5,2,0)	1	$PSL(2, 19)$
	QSRD(190,36,18,9;14,10,9,6,5,4,3)	1	$PSL(2, 19)$
	QSRD(190,36,18,7;12,9,8,7,6,5,4)	1	$PSL(2, 19)$
	QSRD(190,45,36,13;15,13,12,11,10,8,7)	1	$PSL(2, 19)$
	QSRD(190,63,36,20;28,24,23,21,20,16)	1	$PSL(2, 19)$
	QSRD(190,63,54,21;27,25,24,20,19,18,17)	2	$PSL(2, 19)$
	QSRG(190,9,2;2,1,0)	2	$PSL(2, 19)$
	QSRG(190,9,0;1,0)	1	$PSL(2, 19) : \mathbb{Z}_2$
	QSRG(190,18,3;4,2,1,0)	1	$PSL(2, 19) : \mathbb{Z}_2$
	QSRG(190,18,0;4,3,2,1,0)	1	$PSL(2, 19) : \mathbb{Z}_2$
	QSRG(190,18,2;6,3,2,1,0)	1	$PSL(2, 19)$
	QSRG(190,18,2;4,2,1,0)	2	$PSL(2, 19) : \mathbb{Z}_2$
	QSRG(190,18,2;4,3,2,1,0)	2	$PSL(2, 19) : \mathbb{Z}_2$
	QSRG(190,18,0;4,2,1,0)	1	$PSL(2, 19) : \mathbb{Z}_2$
	QSRG(190,18,4;4,2,1,0)	1	$PSL(2, 19) : \mathbb{Z}_2$
	QSRG(190,27,8;7,6,3,2,1,0)	1	$PSL(2, 19) : \mathbb{Z}_2$
	QSRG(190,27,4;7,5,4,3,2)	1	$PSL(2, 19) : \mathbb{Z}_2$
	QSRG(190,27,6;6,5,4,3,2,0)	1	$PSL(2, 19)$
	QSRG(190,27,4;6,5,4,3,2,1)	1	$PSL(2, 19)$
	QSRG(190,27,2;10,6,4,3,2)	1	$PSL(2, 19)$
	QSRG(190,36,6;11,8,6,5,4)	1	$PSL(2, 19) : \mathbb{Z}_2$
	QSRG(190,36,7;12,10,6,4)	1	$PSL(2, 19) : \mathbb{Z}_2$
	QSRG(190,36,10;9,8,6,5,4,0)	1	$PSL(2, 19) : \mathbb{Z}_2$
QSRG(190,36,8;10,9,6,4,3)	1	$PSL(2, 19) : \mathbb{Z}_2$	
QSRG(190,36,8;12,8,6,4)	1	$PSL(2, 19) : \mathbb{Z}_2$	
QSRG(190,36,8;12,10,8,6,5,4,3)	1	$PSL(2, 19) : \mathbb{Z}_2$	
QSRG(190,45,12;18,10,8,6)	1	$PSL(2, 19)$	
QSRG(190,72,27;32,28,26,24)	1	$PSL(2, 19) : \mathbb{Z}_2$	
191	QSRD(191,19,0,2;6,4,2,1,0)	1	$\mathbb{Z}_{191} : \mathbb{Z}_{19}$
	QSRG(191,10,0;2,1,0)	1	$\mathbb{Z}_{191} : \mathbb{Z}_{10}$
	QSRG(191,20,0;5,4,3,2,0)	2	$\mathbb{Z}_{191} : \mathbb{Z}_{10}$

Tablica 4.61: Grafovi dobiveni konstrukcijom iz primitivnih permutacijskih grupa stupnja $n \in \{181, \dots, 191\}$

Stupanj	Parametri	# neizom.	Aut(G) ili Aut(G)
191	QSRG(191,20,0;6,2,1,0)	1	$\mathbb{Z}_{191} : \mathbb{Z}_{10}$
	QSRG(191,20,0;6,4,3,2,0)	1	$\mathbb{Z}_{191} : \mathbb{Z}_{10}$
	QSRG(191,20,6;4,2,1,0)	1	$\mathbb{Z}_{191} : \mathbb{Z}_{10}$
	QSRG(191,20,0;6,4,3,2,1,0)	1	$\mathbb{Z}_{191} : \mathbb{Z}_{10}$
	QSRG(191,30,8;6,5,4,2,1)	1	$\mathbb{Z}_{191} : \mathbb{Z}_{10}$
	QSRG(191,30,0;10,9,8,7,6,5,4,2)	1	$\mathbb{Z}_{191} : \mathbb{Z}_{10}$
	QSRG(191,30,2;10,6,5,4,2)	1	$\mathbb{Z}_{191} : \mathbb{Z}_{10}$
	QSRG(191,30,2;11,10,8,6,4,3,2)	1	$\mathbb{Z}_{191} : \mathbb{Z}_{10}$
	QSRG(191,30,0;10,8,7,6,5,4,2)	1	$\mathbb{Z}_{191} : \mathbb{Z}_{10}$
	QSRG(191,30,0;9,8,6,4,3,2)	1	$\mathbb{Z}_{191} : \mathbb{Z}_{10}$
	QSRG(191,30,2;8,7,6,4,2)	1	$\mathbb{Z}_{191} : \mathbb{Z}_{10}$
	QSRG(191,38,12;8,5,4)	1	$\mathbb{Z}_{191} : \mathbb{Z}_{38}$
	DRT(191,95,47,48)	1	$\mathbb{Z}_{191} : \mathbb{Z}_{95}$
193	QSRG(193,12,2;2,1,0)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{12}$
	QSRG(193,16,0;3,2,0)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{16}$
	QSRG(193,24,2;6,5,4,2,1,0)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{12}$
	QSRG(193,24,2;6,4,3,2,0)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{12}$
	QSRG(193,24,8;6,3,2,1,0)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{12}$
	QSRG(193,24,2;6,4,2,1)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{12}$
	QSRG(193,24,2;6,4,3,2)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{24}$
	QSRG(193,32,0;10,9,8,6,4,3)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{16}$
	QSRG(193,32,6;7,6,4,2)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{16}$
	QSRG(193,32,6;10,8,7,5,4,2)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{16}$
	QSRG(193,32,6;8,5,4)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{32}$
	QSRG(193,36,8;10,9,6,5,4,2)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{12}$
	QSRG(193,36,4;10,8,7,6,5,3)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{12}$
	QSRG(193,36,4;14,12,10,7,6,5,4)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{12}$
	QSRG(193,48,8;16,15,14,12,11,10)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{24}$
	QSRG(193,48,8;18,16,14,11,10,9)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{24}$
	QSRG(193,48,14;14,11,8)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{48}$
QSRG(193,64,18;24,21)	1	$\mathbb{Z}_{193} : \mathbb{Z}_{64}$	
197	QSRD(197,49,0,12;16,12,9)	1	$\mathbb{Z}_{197} : \mathbb{Z}_{49}$
	QSRG(197,14,0;2,1,0)	1	$\mathbb{Z}_{197} : \mathbb{Z}_{14}$
	QSRG(197,28,0;8,6,5,4,2,1)	1	$\mathbb{Z}_{197} : \mathbb{Z}_{14}$
	QSRG(197,28,6;6,4,2,1)	1	$\mathbb{Z}_{197} : \mathbb{Z}_{28}$
	QSRG(197,42,8;14,11,10,9,8,7,6,4)	1	$\mathbb{Z}_{197} : \mathbb{Z}_{14}$
199	QSRD(199,11,0,2;3,2,0)	1	$\mathbb{Z}_{199} : \mathbb{Z}_{11}$
	QSRD(199,22,0,4;7,5,4,2,0)	1	$\mathbb{Z}_{199} : \mathbb{Z}_{11}$
	QSRD(199,22,0,2;7,4,3,2,0)	1	$\mathbb{Z}_{199} : \mathbb{Z}_{11}$
	QSRD(199,33,0,6;10,8,7,6,5,4,2)	1	$\mathbb{Z}_{199} : \mathbb{Z}_{11}$
	QSRD(199,33,0,6;11,8,7,6,4,2)	1	$\mathbb{Z}_{199} : \mathbb{Z}_{11}$
	QSRD(199,33,0,6;9,6,4,2)	1	$\mathbb{Z}_{199} : \mathbb{Z}_{33}$
	QSRG(199,18,2;4,3,2,0)	1	$\mathbb{Z}_{199} : \mathbb{Z}_{18}$
	QSRG(199,22,6;5,4,2,0)	1	$\mathbb{Z}_{199} : \mathbb{Z}_{22}$
	QSRG(199,36,8;11,8,6,5,4,2)	1	$\mathbb{Z}_{199} : \mathbb{Z}_{18}$
	QSRG(199,44,12;14,10,9,8,4)	1	$\mathbb{Z}_{199} : \mathbb{Z}_{22}$
	QSRG(199,54,14;18,17,12,11)	1	$\mathbb{Z}_{199} : \mathbb{Z}_{18}$
	QSRG(199,66,20;25,20)	1	$\mathbb{Z}_{199} : \mathbb{Z}_{66}$
DRT(199,99,49,50)	1	$\mathbb{Z}_{199} : \mathbb{Z}_{99}$	

Tablica 4.62: Grafovi dobiveni konstrukcijom iz primitivnih permutacijskih grupa stupnja $n \in \{191, \dots, 200\}$

Iz navedenih rezultata dobivenih konstrukcijom iz teorema 2.3.3 i 2.3.4 iz primitivnih permutacijskih grupa stupnja $n \in \{31, \dots, 200\}$, dobivamo sljedeći teorem.

Teorem 4.2.1. 1. Postoji, do na izomorfizam, 968 kvazi-jako regularnih grafova na koje djeluje primitivna grupa automorfizama stupnja n , $n \in \{31, \dots, 200\}$, od kojih su njih 84 jako regularni grafovi.

2. Postoje, do na izomorfizam, 223 usmjerena kvazi-jako regularna grafa na koje djeluje primitivna grupa automorfizama stupnja n , $n \in \{31, \dots, 200\}$.

Matrice susjedstva konstruiranih (usmjerenih) regularnih grafova na n vrhova iz kataloga primitivnih grupa, $n \in \{31, \dots, 200\}$, dostupne su na:

www.math.uniri.hr/~matea.zubovic/Primitive.zip

5. KONSTRUKCIJA KODOVA

U ovom poglavlju opisat ćemo konstrukciju samoortogonalnih i LCD kodova iz matrica susjedstva usmjerenih jako regularnih grafova. Kako bismo mogli konstruirati kodove iz matrica susjedstva usmjerenih jako regularnih grafova, promatramo skalarne produkte redaka matrice susjedstva, odnosno presječne brojeve skupova izlaznih susjeda usmjerenog grafa. Uzimamo u obzir matrice susjedstva za koje skalarni produkti svaka dva retka matrice daju isti ostatak modulo p .

Za daljnje istraživanje o konstrukciji samoortogonalnih i LCD kodova, čitatelja upućujemo na [15–19, 29, 45, 49, 50, 53, 55].

5.1. KODOVI IZ USMJERENIH JAKO REGULARNIH GRAFOVA SA $\lambda = 0$ I $t = \mu = 1$

A. Duval je 1988. godine u članku [26] opisao i usmjerene jako regularne grafove s $t = \mu = 1$ i $\lambda = 0$. Pri konstrukciji kodova koristimo lemu 1.3.4.

Primijetimo: u konstrukciji iz leme 1.3.4, svaka dva retka matrice susjedstva A su ili identična ili ortogonalna. Stoga će jedini elementi matrice AA^T biti brojevi 0 i k . Za usmjerene jako regularne grafove s $\lambda = 0$ i $t = \mu = 1$ pri konstrukciji kodova, skalarni produkti (0 i k) redaka matrice AA^T daju ostatak 0 pri dijeljenju brojem p , gdje je p prost broj koji dijeli k . Iz navedenog zaključujemo sljedeće.

Teorem 5.1.1. Neka je \mathcal{G} usmjereni jako regularan graf s parametrima $(k(k+1), k, 0, 1, 1)$, $k \in \mathbb{N}$, $k \geq 2$, i neka je A matrica susjedstva tog usmjerenog grafa. Neka su x i y proizvoljni vrhovi usmjerenog grafa \mathcal{G} . Tada za skupove Δ_x i Δ_y izlaznih susjeda vrhova x i y vrijedi $\Delta_x \cap \Delta_y = \emptyset$ ili $\Delta_x = \Delta_y$.

Dokaz. Iz konstrukcije matrice susjedstva A usmjerenog jako regularnog grafa s parametrima $(k(k+1), k, 0, 1, 1)$ u dokazu leme 1.3.4 slijedi da su svaka dva retka matrice A ili identična ili ortogonalna. Skalarni produkt proizvoljna dva retka matrice A jednak je ili 0 ili k , odnosno skupovi izlaznih susjeda proizvoljna dva vrha usmjerenog grafa su ili međusobno disjunktni ili jednaki. ■

Posljedica 5.1.1. Neka je \mathcal{G} usmjereni jako regularan graf s parametrima $(k(k+1), k, 0, 1, 1)$, $k \in \mathbb{N}$, $k \geq 2$, i neka je A matrica susjedstva tog usmjerenog grafa. Tada za elemente matrice $AA^T = [s_{ij}]$ vrijedi:

$$s_{ij} = \begin{cases} k, & i = j \text{ ili } a_{il} = a_{jl}, \forall l \in \{1, \dots, k(k+1)\} \\ 0, & \text{inače,} \end{cases}$$

odnosno:

$$s_{ij} \equiv 0 \pmod{p}, \forall i, j \in \{1, \dots, n\}, p \in \mathbb{P}, p|k.$$

Primjer 5.1.1. Za usmjereni jako regularan graf s parametrima $(6, 2, 0, 1, 1)$ iz primjera 1.3.2, elementi matrice AA^T su brojevi 0 i 2, stoga skalarni produkt svaka dva retka matrice susjedstva A tog usmjerenog grafa daje ostatak 0 pri dijeljenju brojem 2:

$$AA^T = \begin{bmatrix} 2 & 0 & 0 & 2 & 0 & 0 \\ 0 & 2 & 0 & 0 & 2 & 0 \\ 0 & 0 & 2 & 0 & 0 & 2 \\ 2 & 0 & 0 & 2 & 0 & 0 \\ 0 & 2 & 0 & 0 & 2 & 0 \\ 0 & 0 & 2 & 0 & 0 & 2 \end{bmatrix}.$$

Dakle, dva proizvoljna vrha tog usmjerenog grafa imaju ili 0 ili 2 zajednička izlazna susjeda.

5.1.1. Samoortogonalni kodovi

Iz matrice susjedstva usmjerenog jako regularnog grafa s parametrima (n, k, λ, μ, t) , gdje je $\lambda = 0$ i $t = \mu = 1$, možemo konstruirati samoortogonalne kodove na sljedeći način.

Teorem 5.1.2. Neka je \mathcal{G} usmjereni jako regularan graf s parametrima (n, k, λ, μ, t) , gdje je $\lambda = 0$ i $t = \mu = 1$, i neka je A njegova matrica susjedstva.

- (i) Ako je k paran broj, onda je A matrica incidencije samoortogonalnog $1-(v, k, k)$ dizajna \mathcal{D} i A generira binarni samoortogonalan kod.
- (ii) Ako je k neparan broj, tada je A matrica incidencije p -samoortogonalnog dizajna, gdje je $p \in \mathbb{P}$, $p \neq 2$, $p|k$ i A generira samoortogonalan kod nad poljem \mathbb{F}_p .

Dokaz. (i) Pretpostavimo da je k paran broj. Kako je $\lambda = 0$ i $t = \mu = 1$, iz teorema 5.1.1 slijedi da proizvoljna dva vrha usmjerenog jako regularnog grafa imaju k zajedničkih izlaznih susjeda ili nemaju zajedničkih izlaznih susjeda. Iz navedenog i iz činjenice da je k paran broj, za dva različita retka R_i i R_j matrice susjedstva A vrijedi:

$$R_i \cdot R_i \equiv 0 \pmod{2},$$

$$R_i \cdot R_j \equiv 0 \pmod{2},$$

stoga je matrica A ujedno i matrica incidencije samoortogonalnog $1-(v, k, k)$ dizajna. Iz [55] slijedi da matrica A generira binarni samoortogonalan kod.

- (ii) Pretpostavimo da je k neparan broj i p prost broj veći od 2 koji dijeli k . Kako je $\lambda = 0$ i $t = \mu = 1$, za dva različita retka R_i i R_j matrice susjedstva A vrijedi:

$$R_i \cdot R_i \equiv 0 \pmod{p},$$

$$R_i \cdot R_j \equiv 0 \pmod{p},$$

stoga je matrica A ujedno i matrica incidencije p -samoortogonalnog $1-(v, k, k)$ dizajna. Iz [56] slijedi da matrica A generira samoortogonalan kod nad poljem \mathbb{F}_p . ■

Primjenom gornjeg teorema možemo iz usmjerenih jako regularnih grafova konstruirati kodove na sljedeći način.

1. Neka je A matrica susjedstva usmjerenog jako regularnog grafa s parametrima (n, k, λ, μ, t) takvog da je $\lambda = 0$, $t = \mu = 1$ i k je paran, a proizvoljna dva vrha imaju ili 0 ili k zajedničkih izlaznih susjeda. Tada A generira binarni samoortogonalan $[n, k + 1]$ -kod.
2. Neka je A matrica susjedstva usmjerenog jako regularnog grafa s parametrima (n, k, λ, μ, t) takvog da je $\lambda = 0$, $t = \mu = 1$ i k je neparan, a proizvoljna dva vrha imaju ili 0 ili k zajedničkih izlaznih susjeda. Tada A generira p -samoortogonalan $[n, k + 1]_p$ -kod nad poljem \mathbb{F}_p , gdje je $p \in \mathbb{P}$, $p > 2$, $p|k$.

Napomena 5.1.1. Iz teorema 1.3.2 slijedi da je rang matrice susjedstva A usmjerenog jako regularnog grafa s parametrima (n, k, λ, μ, t) , gdje je $t = \mu$, jednak $1 + \frac{k}{\mu - \lambda}$, pa je dimenzija samoortogonalnih kodova iz teorema 5.1.2 jednaka $k + 1$.

U nastavku prilažemo tablice s parametrima dobivenih samoortogonalnih kodova i usmjerenih jako regularnih grafova iz kojih su dobiveni. Tablice konstruiranih kodova poredane su prema dva slučaja, ovisno o parametru k usmjerenog jako regularnog grafa.

Slučaj 1. Samoortogonalni kodovi iz usmjerenih jako regularnih grafova s parnim k i $\lambda = 0$ i $t = \mu = 1$.

Slučaj 2. Samoortogonalni kodovi iz usmjerenih jako regularnih grafova s neparnim k i $\lambda = 0$ i $t = \mu = 1$.

Napomena 5.1.2. Za neke od konstruiranih kodova iz tablica u ovom poglavlju ne navodimo informacije o grupi automorfizama jer ih nismo bili u mogućnosti odrediti.

Napomena 5.1.3. U tablicama koje slijede optimalni kodovi označeni su sa *, skoro optimalni kodovi sa **, najbolji poznati kodovi sa + i ciklički kodovi sa indeksom c .

Parametri digrafa	Parametri koda \mathcal{C}	$\text{Aut}(\mathcal{C})$ ili $ \text{Aut}(\mathcal{C}) $
$(6, 2, 0, 1, 1)$	$[6, 3, 2]**$	$\mathbb{Z}_2 \times S_4$
$(20, 4, 0, 1, 1)$	$[20, 5, 4]$	955514880
$(12, 3, 0, 1, 1)$	$[12, 4, 3]_3$	31104

Tablica 5.1: Netrivijalni u parovima neekvivalentni samoortogonalni kodovi konstruirani primjenom teorema 5.1.2 iz matrica susjedstva usmjerenih jako regularnih grafova sa $\lambda = 0$ i $t = \mu = 1$ (slučaj 1 i slučaj 2)

Teorem 5.1.3. Postoje, do na ekvivalenciju, dva netrivijalna binarna samoortogonalna koda i jedan kod nad poljem \mathbb{F}_3 , konstruirani iz usmjerenih jako regularnih grafova sa $\lambda = 0, t = \mu = 1$, za tranzitivno djelovanje grupe G na skup Ω , $|\Omega| = n, n \in \{1, \dots, 30\}$. Od toga je jedan binarni kod skoro optimalan.

5.1.2. LCD kodovi

Iz matrice susjedstva usmjerenog jako regularnog grafa s parametrima (n, k, λ, μ, t) , gdje je $\lambda = 0$ i $t = \mu = 1$, možemo konstruirati LCD kodove na sljedeći način.

Teorem 5.1.4. Neka je \mathcal{G} usmjereni jako regularan graf s parametrima (n, k, λ, μ, t) , gdje je $\lambda = 0$ i $t = \mu = 1$, i neka je A njegova matrica susjedstva.

- (i) Ako je k paran broj, onda je A matrica incidencije samoortogonalnog $1-(v, k, k)$ dizajna \mathcal{D} i matrice $[A|I_n]$ i $[A, I_n, \mathbb{1}]$ generiraju binarni LCD kod.
- (ii) Ako je k neparan broj, onda je A matrica incidencije p -samoortogonalnog $1-(v, k, k)$ dizajna \mathcal{D} i matrice $[A|I_n]$ i $[A, I_n, \mathbb{1}]$ generiraju LCD kod nad poljem \mathbb{F}_p , gdje je p prost broj veći od 2 koji dijeli k .

Dokaz. (i) Pretpostavimo da je k paran broj. Iz teorema 5.1.1 znamo da za različite retke R_i i R_j matrice A vrijedi:

$$\begin{aligned} R_i \cdot R_i &\equiv 0 \pmod{2}, \\ R_i \cdot R_j &\equiv 0 \pmod{2} \end{aligned}$$

pa je A matrica incidencije samoortogonalnog $1-(v, k, k)$ dizajna. Iz [56] slijedi da matrice $[A|I_n]$ i $[A, I_n, \mathbb{1}]$ generiraju binarni LCD kod.

- (ii) Pretpostavimo da je k neparan broj. Iz [56] slijedi da matrice $[A|I_n]$ i $[A, I_n, \mathbb{1}]$ generiraju LCD kod nad poljem $\mathbb{F}_p, p \in \mathbb{P}, p \neq 2, p|k$.

■

Primjenom gornjeg teorema možemo iz usmjerenih jako regularnih grafova konstruirati kodove na sljedeći način.

1. Neka je A matrica susjedstva usmjerenog jako regularnog grafa s parametrima (n, k, λ, μ, t) takvog da je $\lambda = 0, t = \mu = 1$ i k je paran, a proizvoljna dva vrha imaju ili 0 ili k zajedničkih izlaznih susjeda. Tada matrice $[A|I_n]$ i $[A, I_n, \mathbb{1}]$ generiraju binarni LCD $[2n, n]$ -kod i binarni LCD $[2n + 1, n]$ -kod, respektivno.
2. Neka je A matrica susjedstva usmjerenog jako regularnog grafa s parametrima (n, k, λ, μ, t) takvog da je $\lambda = 0, t = \mu = 1$ i k je neparan, a proizvoljna dva vrha imaju ili 0 ili k zajedničkih izlaznih susjeda. Tada matrice $[A|I_n]$ i $[A, I_n, \mathbb{1}]$ generiraju LCD $[2n, n]_p$ -kod i LCD $[2n + 1, n]_p$ -kod nad poljem \mathbb{F}_p , respektivno, gdje je $p \in \mathbb{P}, p > 2, p|k$.

U nastavku prilažemo tablice s parametrima dobivenih LCD kodova i usmjerenih jako regularnih grafova iz kojih su dobiveni. Tablice konstruiranih kodova poredane su prema dva slučaja, ovisno o parametrima usmjerenih jako regularnih grafova.

Slučaj 1. LCD kodovi iz usmjerenih jako regularnih grafova s parnim k i $\lambda = 0$ i $t = \mu = 1$.

Slučaj 2. LCD kodovi iz usmjerenih jako regularnih grafova s neparnim k i $\lambda = 0$ i $t = \mu = 1$.

Parametri digrafa	Parametri koda \mathcal{C}	Aut(\mathcal{C}) ili Aut(\mathcal{C})
(6, 2, 0, 1, 1)	[12, 6, 2]	$\mathbb{Z}_2^2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)$
(6, 2, 0, 1, 1)	[13, 6, 2]	$\mathbb{Z}_2^2 \times ((\mathbb{Z}_2^4 : \mathbb{Z}_3) : \mathbb{Z}_2)$
(20, 4, 0, 1, 1)	[40, 20, 2]	
(20, 4, 0, 1, 1)	[41, 20, 2]	
(12, 3, 0, 1, 1)	[24, 12, 2] ₃	
(12, 3, 0, 1, 1)	[25, 12, 2] ₃	

Tablica 5.2: Netrivijalni u parovima neekvivalentni LCD kodovi konstruirani primjenom teorema 5.4.2 iz matrica susjedstva usmjerenih jako regularnih grafova sa $\lambda = 0$ i $t = \mu = 1$ (slučaj 1 i slučaj 2)

Teorem 5.1.5. Postoje, do na ekvivalenciju, tri netrivijalna binarna LCD koda i dva netrivijalna LCD koda nad poljem \mathbb{F}_3 , konstruirana iz usmjerenih jako regularnih grafova sa $\lambda = 0, t = \mu = 1$, za tranzitivno djelovanje grupe G na skup Ω , $|\Omega| = n, n \in \{1, \dots, 30\}$.

5.2. KODOVI IZ USMJERENIH JAKO REGULARNIH GRAFOVA SA $t = \mu > 1$

Motivirani prethodnim rezultatima, konstruirali smo kodove iz matrice susjedstva usmjerenih jako regularnih grafova sa parnim parametrom n te sa $t = \mu$, koristeći matricu susjedstva za konstrukciju samoortogonalnih kodova i proširenu matricu susjedstva za konstrukciju LCD kodova.

5.2.1. Samoortogonalni kodovi

Ovisno o parametrima usmjerenih jako regularnih grafova, konstrukciju samoortogonalnih kodova podijelili smo na dva slučaja:

Slučaj 1. Samoortogonalni kodovi iz usmjerenih jako regularnih grafova s parnim k i $\lambda = 0$ i $t = \mu > 1$.

Slučaj 2. Samoortogonalni kodovi iz usmjerenih jako regularnih grafova s parnim k i $\lambda \neq 0$ i $t = \mu > 1$.

U sljedećoj tablici prikazani su parametri samoortogonalnih kodova dobivenih iz matrica susjedstva usmjerenih jako regularnih grafova na n vrhova, $n \leq 30$, s parnim k , $\lambda = 0$ i $t = \mu > 1$.

Parametri digrafa	Parametri koda \mathcal{C}	$\text{Aut}(\mathcal{C})$ ili $ \text{Aut}(\mathcal{C}) $
(12, 4, 0, 2, 2)	[12, 3, 4]	82944
(18, 6, 0, 3, 3)	[18, 3, 6]	2239488000
(24, 6, 0, 2, 2)	[24, 4, 6]	6449725440000
(24, 8, 0, 4, 4)	[24, 3, 8]	393289924608000
(30, 10, 0, 5, 5)	[30, 3, 10]	286708355039232000000

Tablica 5.3: Netrivijalni binarni u parovima neekvivalentni samoortogonalni kodovi konstruirani iz matrica susjedstva usmjerenih jako regularnih grafova sa $\lambda = 0$ i $t = \mu$ (slučaj 1)

U sljedećoj tablici prikazani parametri samoortogonalnih kodova dobivenih iz matrica susjedstva nekih usmjerenih jako regularnih grafova s parnim k , $\lambda \neq 0$ i $t = \mu > 1$.

Parametri digrafa	Parametri koda \mathcal{C}	$\text{Aut}(\mathcal{C})$ ili $ \text{Aut}(\mathcal{C}) $
(8, 4, 1, 3, 3)	[8, 3, 4]*	$((\mathbb{Z}_2^4 : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$
(10, 4, 1, 2, 2)	[10, 4, 4]*	$\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : S_5)$
(12, 6, 2, 4, 4)	[12, 3, 6]*	$((\mathbb{Z}_2^2 \times (\mathbb{Z}_2^4 : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_3 : \mathbb{Z}_2$
(12, 6, 2, 4, 4)	[12, 4, 4]	$(((((\mathbb{Z}_2^3 \times D_4) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2$
(14, 6, 2, 3, 3)	[14, 7, 4]*	56448
(14, 6, 2, 3, 3)	[14, 7, 2]	645120
(16, 8, 2, 6, 6)	[16, 3, 8]*	7962624
(16, 8, 3, 5, 5)	[16, 5, 8]*	322560
(16, 8, 3, 5, 5)	[16, 5, 4]	98304
(18, 8, 3, 4, 4)	[18, 8, 4]	82944, 185794560
(18, 12, 7, 10, 10)	[18, 4, 8]*	$\mathbb{Z}_2 \times (((\mathbb{Z}_2^2 \times ((\mathbb{Z}_2^6 : \mathbb{Z}_3) : \mathbb{Z}_2)) : \mathbb{Z}_3) : \mathbb{Z}_2) : \mathbb{Z}_2$
(20, 8, 2, 4, 4)	[20, 4, 8]	955514880, 122880
(20, 10, 4, 6, 6)	[20, 6, 4]	3932160
(20, 10, 4, 6, 6)	[20, 6, 6]	122880
(20, 10, 4, 6, 6)	[20, 6, 8]*	$\mathbb{Z}_2^5 : S_6$
(20, 12, 6, 9, 9)	[20, 5, 8]**	737280
(21, 12, 6, 8, 8)	[21, 3, 12]*	47029248
(21, 12, 6, 8, 8)	[21, 6, 8]*	$PSL(3, 2) : \mathbb{Z}_2$
(22, 10, 4, 5, 5)	[22, 11, 6]**	887040
(22, 10, 4, 5, 5)	[22, 11, 2]	81749606400
(26, 12, 5, 6, 6)	[26, 12, 8]*	$PSL(3, 3) : \mathbb{Z}_2$
(26, 12, 5, 6, 6)	[26, 12, 4]	51011754393600
(28, 12, 4, 6, 6)	[28, 4, 12]	770527199232
(28, 12, 4, 6, 6)	[28, 7, 8]	924844032
(28, 12, 4, 6, 6)	[28, 7, 4]	23115815976960
(28, 12, 4, 6, 6)	[28, 7, 12]*	$\mathbb{Z}_2^6 : PSL(3, 2)$
(28, 14, 6, 8, 8)	[28, 8, 8]	7225344
(28, 14, 6, 8, 8)	[28, 8, 6]	924844032
(28, 14, 6, 8, 8)	[28, 8, 4]	10569646080

Tablica 5.4: Netrivijalni binarni u parovima neekvivalentni samoortogonalni kodovi konstruirani iz matrica susjedstva usmjerenih jako regularnih grafova sa $\lambda \neq 0$ i $t = \mu > 1$ (slučaj 2)

5.2.2. LCD kodovi

Ovisno o parametrima usmjerenih jako regularnih grafova, konstrukciju samoortogonalnih kodova podijelili smo na dva slučaja:

Slučaj 1. LCD kodovi iz usmjerenih jako regularnih grafova s parnim k i $\lambda = 0$ i $t = \mu > 1$.

Slučaj 2. LCD kodovi iz usmjerenih jako regularnih grafova s parnim k i $\lambda \neq 0$ i $t = \mu > 1$.

U sljedećoj tablici prikazani parametri LCD kodova dobivenih iz matrica susjedstva usmjerenih jako regularnih grafova na n vrhova, $n \leq 30$, s parnim k , $\lambda = 0$ i $t = \mu > 1$. Dobivene kodove navodimo bez njihovih grupa automorfizama.

Parametri digrafa	Parametri koda \mathcal{C}	Parametri digrafa	Parametri koda \mathcal{C}
(12, 4, 0, 2, 2)	[24, 12, 2]	(24, 6, 0, 2, 2)	[49, 24, 2]
(12, 4, 0, 2, 2)	[25, 12, 2]	(24, 8, 0, 4, 4)	[48, 24, 2]
(18, 6, 0, 3, 3)	[36, 18, 2]	(24, 8, 0, 4, 4)	[49, 24, 2]
(18, 6, 0, 3, 3)	[37, 18, 2]	(30, 10, 0, 5, 5)	[60, 30, 2]
(24, 6, 0, 2, 2)	[48, 24, 2]	(30, 10, 0, 5, 5)	[61, 30, 2]

Tablica 5.5: Netrivijalni binarni u parovima neekvivalentni LCD kodovi konstruirani iz matrica susjedstva usmjerenih jako regularnih grafova $\lambda = 0$ i $t = \mu > 1$ (slučaj 1)

U sljedećoj tablici prikazani parametri LCD kodova dobivenih iz matrica susjedstva nekih usmjerenih jako regularnih grafova s parnim k , $\lambda \neq 0$ i $t = \mu > 1$.

Parametri digrafa	Parametri koda \mathcal{C}	Aut(\mathcal{C}) ili Aut(\mathcal{C})
(8, 4, 1, 3, 3)	[16, 8, 2]	$((\mathbb{Z}_2^2 \times ((\mathbb{Z}_2 \times ((\mathbb{Z}_4 \times \mathbb{Z}_2) : \mathbb{Z}_2)) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$
(8, 4, 1, 3, 3)	[17, 8, 2]	$(((((\mathbb{Z}_8 \times \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2) : \mathbb{Z}_2$
(10, 4, 1, 2, 2)	[20, 10, 2]	$\mathbb{Z}_2^2 \times ((\mathbb{Z}_2^8 : \mathbb{Z}_5) : \mathbb{Z}_2)$
(10, 4, 1, 2, 2)	[20, 10, 2]	$\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : S_5)$
(10, 4, 1, 2, 2)	[21, 10, 2]	$\mathbb{Z}_2^2 \times ((\mathbb{Z}_2^8 : \mathbb{Z}_5) : \mathbb{Z}_2)$
(10, 4, 1, 2, 2)	[21, 10, 2]	$\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : S_5)$
(10, 4, 1, 2, 2)	[20, 10, 3]	$\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : S_5)$
(10, 4, 1, 2, 2)	[21, 10, 4]	$\mathbb{Z}_2 \times (\mathbb{Z}_2^4 : S_5)$
(12, 6, 2, 4, 4)	[24, 12, 2]	$((\mathbb{Z}_2 \times ((\mathbb{Z}_2^2 \times (\mathbb{Z}_2^8 : \mathbb{Z}_3)) : \mathbb{Z}_2)) : \mathbb{Z}_2) : \mathbb{Z}_2$
(12, 6, 2, 4, 4)	[25, 12, 2]	49152

Tablica 5.6: Netrivijalni binarni u parovima neekvivalentni LCD kodovi konstruirani iz matrica susjedstva usmjerenih jako regularnih grafova sa $\lambda \neq 0$ i $t = \mu > 1$ (slučaj 2)

Primijetimo da su u svim tablicama u ovom poglavlju uzeti usmjereni jako regularni grafovi s parnim brojem vrhova.

Zaključit ćemo ovo poglavlje sljedećom hipotezom.

Hipoteza 1. Iz matrica susjedstva usmjerenih jako regularnih grafova s parametrima (n, k, λ, μ, t) , gdje su n i k parni brojevi, $\lambda \neq 0$ i $t = \mu > 1$, mogu se konstruirati binarni samoortogonalan $[n, 1 + \frac{k}{\mu - \lambda}]$ -kod, binarni LCD $[2n, n]$ -kod i binarni LCD $[2n + 1, n]$ -kod, na način opisan u ovom radu.

5.3. KODOVI IZ DVOSTRUKO REGULARNIH TURNIRA I NORMALNO REGULARNIH DIGRAFOVA

U ovom poglavlju opisujemo konstrukciju samoortogonalnih i LCD kodova iz matrica susjedstva dvostruko regularnih turnira i normalno regularnih digrafova. Za konstrukcije samoortogonalnih kodova iz dvostruko regularnih turnira čitatelja upućujemo na [18].

5.3.1. Kodovi iz dvostruko regularnih turnira

Za matricu susjedstva dvostruko regularnog turnira vrijedi:

$$AA^T = kI + (k - 1 - \lambda')A + (k - \mu')(J - I - A).$$

Dakle, skalarni produkti redaka matrice susjedstva, odnosno skalarni produkti skupova izlaznih susjeda tog usmjerenog grafa su brojevi k , $k - 1 - \lambda'$ i $k - \mu'$. Stoga pri konstrukciji kodova uzimamo dvostruko regularne turnire za koje ti brojevi daju isti ostatak pri dijeljenju brojem p , gdje je p prost broj.

Neka je \mathcal{G} dvostruko regularan turnir s parametrima (n, k, λ', μ') takav da je $k \equiv a \pmod{p}$ i $k - 1 - \lambda', k - \mu' \equiv d \pmod{p}$, i neka je A njegova matrica susjedstva. Tada je A matrica incidencije slabo p -samoortogonalnog dizajna iz koje se mogu konstruirati samoortogonalni i LCD kodovi metodama opisanim u [56].

U tablicama 5.7 i 5.8 prikazani su samoortogonalni i LCD kodovi dobiveni iz matrica susjedstva dvostruko regularnih turnira konstruiranih metodom iz teorema 2.3.3 i 2.3.4, iz tranzitivnih permutacijskih grupa stupnja n , $n \in \{7, 11, 19, 23, 27\}$. Navedeni kodovi konstruirani su slijedeći metode iz [56].

Parametri digrafa	Parametri koda \mathcal{C}	$\text{Aut}(\mathcal{C})$ ili $ \text{Aut}(\mathcal{C}) $
$(7, 3, 1, 2)$	$[8, 4, 4]^*$	$\mathbb{Z}_2^3 : \text{PSL}(3, 2)$
$(11, 5, 2, 3)$	$[12, 6, 2]_3^*$	
$(19, 9, 4, 5)$	$[38, 19, 8]^{**}$	$\mathbb{Z}_{19} : \mathbb{Z}_{18}$
$(23, 11, 5, 6)$	$[24, 12, 8]^*+$	244823040
$(27, 13, 6, 7)$	$[54, 27, 10]$	$((\mathbb{Z}_3 \times \mathbb{Z}_3 \times \mathbb{Z}_3) : C13) : \mathbb{Z}_3) : \mathbb{Z}_2$

Tablica 5.7: Samoortogonalni kodovi konstruirani iz matrica susjedstva dvostruko regularnih turnira na n vrhova, $n \leq 30$

Parametri digrafa	Parametri koda \mathcal{C}	$\text{Aut}(\mathcal{C})$ ili $ \text{Aut}(\mathcal{C}) $
(7, 3, 1, 2)	$[15, 8, 4]**$	$PSL(3, 2)$
(11, 5, 2, 3)	$[22, 11, 6]_3$	
(19, 9, 4, 5)	$[19, 19, 1]_c***+$	
(23, 11, 5, 6)	$[47, 23, 8]$	
(27, 13, 6, 7)	$[27, 27, 1]_c**+$	

Tablica 5.8: LCD kodovi konstruirani iz matrica susjedstva dvostruko regularnih turnira na n vrhova, $n \leq 30$

5.3.2. Kodovi iz normalno regularnih usmjerenih grafova

Iako metodom opisanom u teoremu 2.3.3, odnosno teoremu 2.3.4 konstrukcijom nismo dobili normalno regularne usmjerene grafove, njihova matrica susjedstva ima lijepa svojstva za konstrukciju kodova.

Za matricu susjedstva normalno regularnog usmjerenog grafa vrijedi:

$$AA^T = kI + \lambda''(A + A^T) + \mu''(J - I - A - A^T).$$

Dakle, skalarni produkti redaka matrice susjedstva, odnosno presječni brojevi skupova izlaznih susjeda tog usmjerenog grafa su upravo parametri k , λ'' i μ'' . Stoga pri konstrukciji kodova uzimamo normalno regularne usmjerene grafove za koje navedeni parametri daju isti ostatak pri dijeljenju brojem p , gdje je p prost broj.

Neka je \mathcal{G} normalno regularan usmjereni graf s parametrima (n, k, λ'', μ'') takav da je $k \equiv a \pmod{p}$ i $\lambda'', \mu'' \equiv d \pmod{p}$ i neka je A njegova matrica susjedstva. Tada je A matrica incidencije slabo p -samoortogonalnog dizajna iz koje se mogu konstruirati samoortogonalni i LCD kodovi metodama opisanim u [56].

Za primjer uzimamo Cayleyev graf $\text{Cay}(\mathbb{Z}_{19}, \{1, 4, 6, 7, 9, 11\})$. Navedeni graf je normalno regularan usmjereni graf s parametrima $(19, 6, 1, 3)$ ([39]). Elementi matrice AA^T su brojevi $k = 6$, $\lambda'' = 1$ i $\mu'' = 3$ i svi daju ostatak 1 pri dijeljenju brojem $p = 2$.

Matrica susjedstva normalno regularnog usmjerenog grafa s parametrima $(19, 6, 1, 3)$ je

$$A = \begin{bmatrix} 0 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 1 \\ 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 \\ 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 \\ 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}.$$

Iz matrice susjedstva A usmjerenog grafa $\text{NRD}(19, 6, 1, 3)$ metodama opisanim u [56] konstruirali smo sljedeće kodove.

	Parametri koda \mathcal{C}	$\text{Aut}(\mathcal{C})$ ili $ \text{Aut}(\mathcal{C}) $
Samoortogonalan kod	$[39, 19, 8]$	$\mathbb{Z}_{19} : \mathbb{Z}_3$
LCD kodovi	$[19, 18, 2]^*+$	121645100408832000
	$[20, 19, 1]**$	121645100408832000

Tablica 5.9: Netrivijalni binarni u parovima neekvivalentni samoortogonalni i LCD kodovi konstruirani iz matrice susjedstva normalno regularnog usmjerenog grafa s parametrima $(19, 6, 1, 3)$

5.4. KODOVI IZ KRONECKEROVA PRODUKTA

Kodove možemo konstruirati i iz Kroneckerova produkta matrice susjedstva A usmjerenog jako regularnog grafa s parametrima (n, k, λ, μ, t) , gdje je $t = \mu$, i matrice J_m , $m \in \mathbb{N}$, $m \geq 2$. Uzmemo li paran broj m , skalarni produkti dva proizvoljna retka matrice $A \otimes J_m$ ($J_m \otimes A$) bit će parni brojevi, stoga vrijede sljedeći teoremi.

Teorem 5.4.1. Neka je A matrica susjedstva usmjerenog jako regularnog grafa s parametrima (n, k, λ, μ, t) , gdje je $t = \mu$, i neka je J_m , $m \in \mathbb{N}$, matrica reda m sa svim jedinicama. Ako je m paran broj, onda matrice $A \otimes J_m$ i $J_m \otimes A$ generiraju binarni samoortogonalni $[mn, 1 + \frac{k}{d}]$ -kod.

Dokaz. Za paran broj m , matrica $A \otimes J_m$ ($J_m \otimes A$) je matrica susjedstva usmjerenog jako regularnog grafa s parametrima $(nm, km, \lambda m, \mu m, tm)$ za koju su skalarni produkti proizvoljna dva retka svi kongruentni modulo 2, pa slijedi da navedena matrica generira binarni samoortogonalni kod s parametrima $[mn, 1 + \frac{k}{d}]$, gdje je d pozitivan cijeli broj opisan u teoremu 1.3.2. ■

Kodovi konstruirani na opisani način dani su u tablici 5.11.

Teorem 5.4.2. Neka je A matrica susjedstva usmjerenog jako regularnog grafa s parametrima (n, k, λ, μ, t) , gdje je $t = \mu$, i neka je J_m , $m \in \mathbb{N}$, matrica reda m sa svim jedinicama. Ako je m paran broj, onda matrice $[A \otimes J_m | I_{mn}]$ ($[J_m \otimes A | I_{mn}]$) i $[A \otimes J_m, I_{mn}, \mathbb{1}]$ ($[J_m \otimes A, I_{mn}, \mathbb{1}]$) generiraju binarni LCD $[2mn, mn]$ -kod i binarni LCD $[2mn + 1, mn]$ -kod, respektivno.

Dokaz. Za paran broj m , matrica $A \otimes J_m$ ($J_m \otimes A$) je matrica susjedstva usmjerenog jako regularnog grafa s parametrima $(nm, km, \lambda m, \mu m, tm)$ za koju su skalarni produkti proizvoljna dva retka svi kongruentni modulo 2, pa iz teorema i slijedi da matrice $[A \otimes J_m | I_{mn}]$ i $[A \otimes J_m, I_{mn}, \mathbb{1}]$ generiraju binarne LCD kodove. ■

Kodovi konstruirani na opisani način dani su u tablici 5.13.

5.4.1. Samoortogonalni kodovi konstruirani iz Kroneckerova produkta

Neka je \mathcal{G} usmjereni jako regularan graf s parametrima (n, k, λ, μ, t) , gdje je $t = \mu$, i matricom susjedstva A . Za usmjereni jako regularan graf s matricom susjedstva $A \otimes J_m$ i parametrima $(nm, km, \lambda m, \mu m, tm)$ konstruiramo samoortogonalne kodove. Za primjer uzimamo usmjereni jako regularan graf s parametrima $(8, 4, 1, 3, 3)$. Iz matrice susjedstva tog usmjerenog grafa konstruirali smo samoortogonalan binarni kod s parametrima $[8, 3, 4]$. Navedeni kod je optimalan. Za paran broj $m \in \mathbb{N}$, $m \geq 2$ konstruirali smo kodove iz matrica $A \otimes J_m$. Konstruirani kodovi navedeni su u sljedećoj tablici. Grupe automorfizama nismo navodili jer ih za duljinu koda ≥ 64 nismo uspjeli odrediti.

Parametri digrafa	Parametri koda \mathcal{C}	Parametri koda \mathcal{C}
(8,4,1,3,3)	[16, 3, 8]*	[224,3,112]
	[32,3,16]	[240,3,120]
	[48,3,24]	[256,3,128]
	[64,3,32]	[272,3,136]
	[80,3,40]	[288,3,144]
	[96,3,48]	[304,3,152]
	[112,3,56]	[320,3,160]
	[128,3,64]	[336,3,168]
	[144,3,72]	[352,3,176]
	[160,3,80]	[368,3,184]
	[176,3,88]	[384,3,192]
	[192,3,96]	[400,3,200]
[208,3,104]	[416,3,208]	

Tablica 5.10: Netrivijalni binarni u parovima neekvivalentni samoortogonalni kodovi konstruirani iz matrica susjedstva $A \otimes J_m$ usmjerenih jako regularnih grafova s parametrima $(8m, 4m, m, 3m, 3m)$, za m paran prirodan broj, $m \leq 52$

Komplement usmjerenog jako regularnog grafa s parametrima $(8, 4, 1, 3, 3)$ je usmjereni jako regularan graf s parametrima $(8, 3, 1, 1, 2)$. Iz matrice susjedstva komplementa konstruirali smo samoortogonalan binarni kod s parametrima $[8, 3, 4]$. Navedeni kod je optimalan i najbolji poznati kod s tim parametrima. Za paran broj $m \in \mathbb{N}$, $m \geq 2$ konstruirali smo kodove iz matrica $A \otimes J_m$. Konstruirani kodovi navedeni su u sljedećoj tablici.

Parametri digrafa	Parametri koda \mathcal{C}	Parametri koda \mathcal{C}
(8,3,1,1,2)	[16, 8, 2]	[176,8,22]
	[32,8,4]	[192,8,24]
	[48,8,6]	[208,8,26]
	[64,8,8]	[224,8,20]
	[80,8,10]	[240,8,30]
	[96,8,12]	[256,8,32]
	[112,8,14]	[272,8,34]
	[128,8,16]	[288,8,36]
	[144,8,18]	[304,8,38]
	[160,8,20]	[320,8,40]

Tablica 5.11: Netrivijalni binarni u parovima neekvivalentni samoortogonalni kodovi konstruirani iz matrica $A \otimes J_m$, gdje je A matrica susjedstva usmjerenog jako regularnog grafa s parametrima $(8, 3, 1, 1, 2)$, m paran prirodan broj, $m \leq 40$

5.4.2. LCD kodovi konstruirani iz Kroneckerova produkta

Neka je \mathcal{G} usmjereni jako regularan graf s parametrima (n, k, λ, μ, t) , gdje je $t = \mu$, i matricom susjedstva A . Za usmjereni jako regularan graf s matricom susjedstva $A \otimes J_m$ i parametrima $(nm, km, \lambda m, \mu m, tm)$ konstruiramo LCD kodove. Za primjer uzimamo usmjereni jako regularan graf s parametrima $(8, 4, 1, 3, 3)$. Za paran broj $m \in \mathbb{N}$, $m \geq 2$ konstruirali smo kodove iz matrica $[A \otimes J_m | I_{mn}]$ i $[A \otimes J_m, I_{mn}, \mathbb{1}]$. Konstruirani kodovi navedeni su u sljedećoj tablici. Grupe automorfizama nismo navodili jer ih za duljinu koda ≥ 64 nismo uspjeli odrediti.

Parametri digrafa	Parametri koda \mathcal{C}	Parametri koda \mathcal{C}
(8,4,1,3,3)	[32,16,2]	[96,48,2]
	[33,16,2]	[97,48,2]
	[64,32,2]	[128,64,2]
	[65,32,2]	[129,64,2]

Tablica 5.12: Netrivijalni binarni u parovima neekvivalentni LCD kodovi konstruirani iz matrica susjedstva $A \otimes J_m$ usmjerenih jako regularnih grafova s parametrima $(8m, 4m, m, 3m, 3m)$, za m paran prirodan broj, $m \leq 8$

Konstruiramo i kodove iz matrica $[A \otimes J_m | I_{mn}]$ i $[A \otimes J_m, I_{mn}, \mathbb{1}]$, za paran broj $m \in \mathbb{N}$, $m \geq 2$, gdje je A matrica susjedstva usmjerenog regularnog grafa s parametrima $(8, 3, 1, 1, 2)$, koji je komplement usmjerenog jako regularnog grafa s parametrima $(8, 4, 1, 3, 3)$. Konstruirani kodovi navedeni su u sljedećoj tablici.

Parametri digrafa	Parametri koda \mathcal{C}	Parametri koda \mathcal{C}
(8,4,1,3,3)	[32,16,2]	[96,48,2]
	[33,16,2]	[97,48,2]
	[64,32,2]	[128,64,2]
	[65,32,2]	[129,64,2]

Tablica 5.13: Netrivijalni binarni u parovima neekvivalentni LCD kodovi konstruirani iz matrica $A \otimes J_m$, gdje je A matrica susjedstva usmjerenog jako regularnog grafa s parametrima $(8, 3, 1, 1, 2)$, m paran prirodan broj, $m \leq 8$

ZAKLJUČAK

Konstrukcija usmjerenih regularnih grafova je tema koju proučava mnoštvo matematičara. U drugom poglavlju disertacije prikazane su konstrukcije usmjerenih kvazi-jako regularnih grafova iz matrica susjedstva. Koristeći do sad poznata svojstva usmjerenih kvazi-jako regularnih grafova, opisani su parametri komplementa usmjerenog kvazi-jako regularnog grafa. Također, opisana je i dokazana konstrukcija familija usmjerenih kvazi-jako regularnih grafova, čime je proširena konstrukcija istih iz leksikografskog produkta usmjerenih grafova, opisana u [26] i [33]. Također, pokazano je i da je transponirana matrica matrice susjedstva također matrica susjedstva usmjerenog kvazi-jako regularnog grafa.

U drugom poglavlju disertacije, nastavno na konstrukciju 1-dizajna iz [20], razvijena je i metoda konstrukcije usmjerenih regularnih grafova koristeći tranzitivne permutacijske grupe, te opisana metoda konstrukcije usmjerenih regularnih grafova za netranzitivno djelovanje konačne grupe.

U trećem poglavlju opisan je i algoritam konstrukcije usmjerenih regularnih grafova koristeći orbite stabilizatora tranzitivne permutacijske grupe. Razvijene metode potkrijepljene su djelomičnim i/ili potpunim klasifikacijama i konkretnim primjerima. U tablicama su dani parametri dobivenih grafova, do na izomorfizam, kao i informacija o njihovoj grupi automorfizama.

U radu [33] konstruirani su usmjereni kvazi-jako regularni grafovi razreda dva na najviše sedam vrhova, te usmjereni kvazi-jako regularni grafovi razreda $p > 1$ na najviše osam vrhova. Primjenom metode za konstrukciju tranzitivnih usmjerenih grafova, u radu je konstruiran veliki broj novih usmjerenih kvazi-jako regularnih grafova i pokazano je da ne postoji usmjereni jako regularan graf na 22 vrha koji je 9-regularan (12-regularan) i takav da grupa G djeluje tranzitivno na skup točaka tog usmjerenog grafa.

U posljednjem poglavlju, primjenjujući svojstva usmjerenih grafova promatranih u ovom radu, te analizirajući metode konstrukcije korištene u radu, opisane su i primijenjene metode konstrukcije samoortogonalnih i LCD kodova iz matrica susjedstva usmjerenih regularnih grafova. Parametri dobivenih kodova i informacije o njihovoj grupi automorfizama prikazane su u tablicama, u kojima je navedeno i iz kojeg su usmjerenog grafa konstruirani te primjenom koje metode.

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ŽIVOTOPIS

Matea Zubović rođena je 12.12.1993. godine u Rijeci gdje je završila osnovnu školu i klasičnu gimnaziju. Završila je preddiplomski studij matematike 2015. godine na Odjelu za matematiku Sveučilišta u Rijeci. Iste godine upisala je diplomski studij Diskretna matematika i primjene i završila ga 2017. godine. Nakon završetka studija upisala je zajednički sveučilišni doktorski studij matematike sveučilišta u Osijeku, Rijeci, Splitu i Zagrebu. Od listopada 2017. godine radi kao asistent na Fakultetu za matematiku Sveučilišta u Rijeci, gdje je članica Zavoda za diskretnu matematiku.

Znanstveno se usavršavala sudjelujući na međunarodnim ljetnim školama matematike "9th PhD Summer School in Discrete Mathematics" (lipanj 2019., Rogla, Slovenija), "Graphs and Groups, Geometries and Graphs" (lipanj 2021., Rogla, Slovenija), "10th PhD Summer School in Discrete Mathematics" (lipanj 2022., Rogla, Slovenija) i "11th PhD Summer School in Discrete Mathematics" (lipanj 2023., Koper, Slovenija). Sudjelovala je i na znanstvenim skupovima "8th European Congress of Mathematics" (lipanj 2021., Portorž, Slovenija), "Combinatorial Designs and Codes" (srpanj 2021., Rijeka), "Simpozij studenata doktorskih studija PMF-a" (travanj 2022., Zagreb) i "Rijeka Conference on Combinatorial Objects and Their Applications" (srpanj 2023., Rijeka).

Članica je Društva matematičara i fizičara, Alumni kluba Fakulteta za matematiku i Seminara za konačnu matematiku, u sklopu kojeg je održala niz seminara.