

Fuzzy Tri-Magic Labeling Of Non-Isomorphic Trees Of Diameter 5 – Paper 2

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Abstract:

Background: Let G be a finite, simple, undirected, and non-trivial graph. A fuzzy graph is said to admit tri-magic labeling if the number of magic membership values K_i 's, $1 \leq i \leq 3$ differ by at most 1 and $|K_i - K_j| \leq \frac{2}{10^r}$ for $1 \leq i, j \leq 3, r \geq 2$.

Methods: The fuzzy graph which admits a tri-magic labeling is called a fuzzy tri-magic labeling graph. The fuzzy tri-magic labeling graphs are denoted by $\tilde{T}m_0G$. A connected graph without any cycle is called a tree.

Results: It is established that non-isomorphic trees of diameter 5 admit Fuzzy tri-magic labeling.

Conclusion: In this paper it is proved that non-isomorphic trees of diameter 5 are Fuzzy tri-magic.

Key Words: Fuzzy Tri-Magic Labeling; Diameter of a graph; Tree.

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I. Introduction

The graphs considered here are finite, simple, undirected, and non-trivial.¹ Graph theory has a good development in the graph labeling and has a broad range of applications.² Fuzzy is a newly emerging mathematical framework to exhibit the phenomenon of uncertainty in real life tribulations. A fuzzy set is defined mathematically by assigning a value to each possible individual in the universe of discourse, representing its grade or membership which corresponds to the degree to which that individual is similar or compatible with the concept represented the fuzzy set. In this paper it is proved that non-isomorphic trees of diameter 5 are Fuzzy tri-magic.

II. Definitions And Notations

In this section, we define the terms and notations essential for the formulation of our results.

Definition 1 Fuzzy graph

A fuzzy graph $G: (\sigma, \mu)$ is a pair of functions $\sigma: V \rightarrow [0, 1]$ and $\mu: V \times V \rightarrow [0, 1]$, where for all $u, v \in V$, we have $\mu(u, v) \leq \sigma(u) \wedge \sigma(v)$.

Definition 2 Fuzzy Labeling

Let $G = (V, E)$ be a graph, the fuzzy graph $G: (\sigma, \mu)$ is said to have a fuzzy labeling, if $\sigma: V \rightarrow [0, 1]$ and $\mu: V \times V \rightarrow [0, 1]$ is bijective such that the membership value of edges and vertices is distinct and $\mu(uv) \leq \sigma(u) \wedge \sigma(v)$ for all $u, v \in V$.

Definition 3 Magic membership value (MMV)³

Let $G: (\sigma, \mu)$ be a fuzzy graph; the induced map $g: E(G) \rightarrow [0, 1]$ defined by $g(uv) = \sigma(u) + \mu(uv) + \sigma(v)$ is said to be a magic membership value. It is denoted by MMV.

Definition 4 Fuzzy tri-magic labeling

A fuzzy graph is said to admit tri-magic labeling if the magic membership values K_i 's, $1 \leq i \leq 3$ are constants where number of K_i 's and K_j 's differ by at most 1 and $|K_i - K_j| \leq \frac{2}{10^r}$ for $1 \leq i, j \leq 3, r \geq 2$.

Definition 5 Fuzzy tri-magic labeling graph

A fuzzy labeling graph which admits a tri-magic labeling is called a fuzzy tri-magic labeling graph. The fuzzy tri-magic labeling graphs are denoted by $\tilde{T}m_0G$.

Definition 6 Diameter of a graph

The maximum distance between two vertices of a tree is called the diameter of a graph.

Definition 7 Tree

A connected graph without any cycle is called a tree.⁵

Notation 1^{6,7}

Let $T_{t_1, t_2, t_3, t_4}^{s_1}$ is a tree obtained by attaching m pendant edges, n pendant edges, a pendant edges and b pendant edges to the path P_s at the vertices v_{t_1+1} , v_{t_2+1} , v_{t_3+1} and v_{t_4+1} respectively.

III. Main Result

Theorem 1: The tree $T_{2,3,4,5}^6$ of diameter 5 admits fuzzy tri-magic labeling (for $m \equiv 0(mod 3)$).

Proof:

Let G be a tree $T_{2,3,4,5}^6$ of diameter 5. $|V(G)| = m + n + a + b + 6$ and $|E(G)| = m + n + a + b + 5$.

Let the vertex set and edge set of $T_{2,3,4,5}^6$ be

$$V(G) = \{v_j: 1 \leq j \leq 6\} \cup \{w_j: 1 \leq j \leq m\} \cup \{x_j: 1 \leq j \leq n\} \cup \{y_j: 1 \leq j \leq a\} \\ \cup \{z_j: 1 \leq j \leq b\} \text{ and} \\ E(G) = \{v_j v_{j+1}: 1 \leq j \leq 5\} \cup \{v_2 w_j: 1 \leq j \leq m\} \cup \{v_3 x_j: 1 \leq j \leq n\} \cup \{v_4 y_j: 1 \leq j \leq a\} \\ \cup \{v_5 z_j: 1 \leq j \leq b\}$$

Let $r \geq 2$ be any positive integer.

Case (i) If $m \equiv 0(mod 3)$

Define $\sigma: V \rightarrow [0, 1]$ such that

$$\sigma(v_j) = (2m + 2n + 2a + 2b + 32 - j) \frac{1}{10^r} \quad 1 \leq j \leq 6 \\ \sigma(w_j) = (2m + 2n + 2a + 2b + 25 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{m}{3} \\ \sigma(w_j) = (2m + 2n + 2a + 2b + 24 - j) \frac{1}{10^r} \quad \text{for } \frac{m}{3} + 1 \leq j \leq \frac{2m}{3} \\ \sigma(w_j) = (2m + 2n + 2a + 2b + 23 - j) \frac{1}{10^r} \quad \text{for } \frac{2m}{3} + 1 \leq j \leq m$$

Define $\mu: V \times V \rightarrow [0, 1]$ by

$$\mu(v_2 w_j) = (7 + j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq m \\ \mu(v_3 x_j) = (m + 10 + j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq n \\ \mu(v_4 y_j) = (m + n + 13 + j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq a \\ \mu(v_5 z_j) = (m + n + a + 16 + j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq b$$

$$\mu(v_1 v_2) = \frac{1}{10^r} \\ \mu(v_2 v_3) = \frac{3}{10^r} \\ \mu(v_3 v_4) = \frac{4}{10^r} \\ \mu(v_4 v_5) = \frac{6}{10^r} \\ \mu(v_5 v_6) = \frac{7}{10^r}$$

Subcase (i) If $n \equiv 0(mod 3)$, $a \equiv 0(mod 3)$

$$\sigma(x_j) = (m + 2n + 2a + 2b + 23 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{n}{3} \\ \sigma(x_j) = (m + 2n + 2a + 2b + 22 - j) \frac{1}{10^r} \quad \text{for } \frac{n}{3} + 1 \leq j \leq \frac{2n}{3} \\ \sigma(x_j) = (m + 2n + 2a + 2b + 21 - j) \frac{1}{10^r} \quad \text{for } \frac{2n}{3} + 1 \leq j \leq n \\ \sigma(y_j) = (m + n + 2a + 2b + 21 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{a}{3} \\ \sigma(y_j) = (m + n + 2a + 2b + 20 - j) \frac{1}{10^r} \quad \text{for } \frac{a}{3} + 1 \leq j \leq \frac{2a}{3}$$

$$\sigma(y_j) = (m + n + 2a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } \frac{2a}{3} + 1 \leq j \leq a$$

Subcase (i)a If $b \equiv 0(\text{mod } 3)$

$$\sigma(z_j) = (m + n + a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{b}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 18 - j) \frac{1}{10^r} \quad \text{for } \frac{b}{3} + 1 \leq j \leq \frac{2b}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 17 - j) \frac{1}{10^r} \quad \text{for } \frac{2b}{3} + 1 \leq j \leq b$$

Subcase (i)b If $b \equiv 1(\text{mod } 3)$

$$\sigma(z_j) = (m + n + a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{b-1}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 18 - j) \frac{1}{10^r} \quad \text{for } \frac{b-1}{3} + 1 \leq j \leq \frac{2(b-1)}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 17 - j) \frac{1}{10^r} \quad \text{for } \frac{2(b-1)}{3} + 1 \leq j \leq b$$

Subcase (i)c If $b \equiv 2(\text{mod } 3)$

$$\sigma(z_j) = (m + n + a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{b+1}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 18 - j) \frac{1}{10^r} \quad \text{for } \left(\frac{b+1}{3}\right) + 1 \leq j \leq \frac{2b-1}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 17 - j) \frac{1}{10^r} \quad \text{for } \left(\frac{2b-1}{3}\right) + 1 \leq j \leq b$$

The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$ are tabulated in Table no 1.

Table no 1: The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$.

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
$m \equiv 0(\text{mod } 3), n \equiv 0(\text{mod } 3), a \equiv 0(\text{mod } 3)$	$b \equiv 0(\text{mod } 3)$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+6}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n}{3} + 1 \leq j \leq \frac{2n}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a}{3} + 1 \leq j \leq \frac{2a}{3}$ $g(v_5z_j)$ if $\frac{b}{3} + 1 \leq j \leq \frac{2b}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+6}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+3}{3}$ for $i = 3$

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
	$b \equiv 1 \pmod{3}$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_i)$ if $1 \leq j \leq \frac{a}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b-1}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+5}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n}{3} + 1 \leq j \leq \frac{2n}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a}{3} + 1 \leq j \leq \frac{2a}{3}$ $g(v_5z_j)$ if $\frac{b-1}{3} + 1 \leq j \leq \frac{2(b-1)}{3}$ $g(v_4z_i)$ if $\frac{l}{3} + 1 \leq i \leq \frac{2l}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+5}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2(b-1)}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $\frac{2l}{3} + 1 \leq i \leq l$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+5}{3}$ for $i = 3$
	$b \equiv 2 \pmod{3}$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_i)$ if $1 \leq j \leq \frac{a}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b+1}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+7}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n}{3} + 1 \leq j \leq \frac{2n}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a}{3} + 1 \leq j \leq \frac{2a}{3}$ $g(v_5z_j)$ if $\frac{b+1}{3} + 1 \leq j \leq \frac{2b-1}{3}$ $g(v_4z_i)$ if $\frac{l}{3} + 1 \leq i \leq \frac{2l}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+4}{3}$ for $i = 2$

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b-1}{3} + 1 \leq i \leq b$ $g(v_4z_i)$ if $\frac{2l}{3} + 1 \leq i \leq l$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+4}{3}$ for $i = 3$

Subcase (ii) If $n \equiv 0(mod\ 3)$, $a \equiv 1(mod\ 3)$

$$\begin{aligned} \sigma(x_j) &= (m + 2n + 2a + 2b + 23 - j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{n}{3} \\ \sigma(x_j) &= (m + 2n + 2a + 2b + 22 - j) \frac{1}{10^r} & \text{for } \frac{n}{3} + 1 \leq j \leq \frac{2n}{3} \\ \sigma(x_j) &= (m + 2n + 2a + 2b + 21 - j) \frac{1}{10^r} & \text{for } \frac{2n}{3} + 1 \leq j \leq n \\ \sigma(y_j) &= (m + n + 2a + 2b + 21 - j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{a-1}{3} \\ \sigma(y_j) &= (m + n + 2a + 2b + 20 - j) \frac{1}{10^r} & \text{for } \frac{a-1}{3} + 1 \leq j \leq \frac{2(a-1)}{3} \\ \sigma(y_j) &= (m + n + 2a + 2b + 19 - j) \frac{1}{10^r} & \text{for } \frac{2(a-1)}{3} + 1 \leq j \leq a \end{aligned}$$

Subcase (ii)a If $b \equiv 0(mod\ 3)$

$$\begin{aligned} \sigma(z_j) &= (m + n + a + 2b + 19 - j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{b}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 18 - j) \frac{1}{10^r} & \text{for } \frac{b}{3} + 1 \leq j \leq \frac{2b}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 17 - j) \frac{1}{10^r} & \text{for } \frac{2b}{3} + 1 \leq j \leq b \end{aligned}$$

Subcase (ii)b If $b \equiv 1(mod\ 3)$

$$\begin{aligned} \sigma(z_j) &= (m + n + a + 2b + 19 - j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{b+2}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 18 - j) \frac{1}{10^r} & \text{for } (\frac{b+2}{3}) + 1 \leq j \leq \frac{2b+1}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 17 - j) \frac{1}{10^r} & \text{for } (\frac{2b+1}{3}) + 1 \leq j \leq b \end{aligned}$$

Subcase (ii)c If $b \equiv 2(mod\ 3)$

$$\begin{aligned} \sigma(z_j) &= (m + n + a + 2b + 19 - j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{b+1}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 18 - j) \frac{1}{10^r} & \text{for } (\frac{b+1}{3}) + 1 \leq j \leq \frac{2(b+1)}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 17 - j) \frac{1}{10^r} & \text{for } \frac{2(b+1)}{3} + 1 \leq j \leq b \end{aligned}$$

The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$ are tabulated in Table no 2.

Table no 2: The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$.

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$

Nature of m, n, a	Nature of b	Edges	MMV K'_i 's, $1 \leq i \leq 3$	Number of K'_i 's, $1 \leq i \leq 3$
$m \equiv 0(mod 3), n \equiv 0(mod 3), a \equiv 1(mod 3)$	$b \equiv 0(mod 3)$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a-1}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+5}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n}{3} + 1 \leq j \leq \frac{2n}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a-1}{3} + 1 \leq j \leq \frac{2(a-1)}{3}$ $g(v_5z_j)$ if $\frac{b}{3} + 1 \leq j \leq \frac{2b}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+5}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2(a-1)}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+5}{3}$ for $i = 3$
	$b \equiv 1(mod 3)$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a-1}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b+2}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+7}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n}{3} + 1 \leq j \leq \frac{2n}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a-1}{3} + 1 \leq j \leq \frac{2(a-1)}{3}$ $g(v_5z_j)$ if $\frac{b+2}{3} + 1 \leq j \leq \frac{2b+1}{3}$ $g(v_4z_i)$ if $\frac{l}{3} + 1 \leq i \leq \frac{2l}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+4}{3}$ for $i = 2$

Nature of m, n, a	Nature of b	Edges	MMV $K_i's$, $1 \leq i \leq 3$	Number of $K_i's$, $1 \leq i \leq 3$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2(a-1)}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2(b+1)}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $\frac{2l}{3} + 1 \leq i \leq l$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+4}{3}$ for $i = 3$
	$b \equiv 2(mod 3)$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a-1}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b+1}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+6}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n}{3} + 1 \leq j \leq \frac{2n}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a-1}{3} + 1 \leq j \leq \frac{2(a-1)}{3}$ $g(v_5z_j)$ if $\frac{b+1}{3} + 1 \leq j \leq \frac{2(b+1)}{3}$ $g(v_4z_i)$ if $\frac{l}{3} + 1 \leq i \leq \frac{2l}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+6}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2(a-1)}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2(b+1)}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $\frac{2l}{3} + 1 \leq i \leq l$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+3}{3}$ for $i = 3$

Subcase (iii) If $n \equiv 0(mod 3)$, $a \equiv 2(mod 3)$

$$\sigma(x_j) = (2m + 2n + 2a + 20 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{m}{3}$$

$$\sigma(x_j) = (2m + 2n + 2a + 19 - j) \frac{1}{10^r} \quad \text{for } \frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$$

$$\sigma(x_j) = (2m + 2n + 2a + 18 - j) \frac{1}{10^r} \quad \text{for } \frac{2m}{3} + 1 \leq j \leq m$$

$$\sigma(y_j) = (m + n + 2a + 2b + 21 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{a+1}{3}$$

$$\sigma(y_j) = (m + n + 2a + 2b + 20 - j) \frac{1}{10^r} \quad \text{for } \left(\frac{a+1}{3}\right) + 1 \leq j \leq \frac{2a-1}{3}$$

$$\sigma(y_j) = (m + n + 2a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } \left(\frac{2a-1}{3}\right) + 1 \leq j \leq a$$

Subcase (iii)a If $b \equiv 0(\text{mod } 3)$

$$\sigma(z_j) = (m + n + a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{b}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 18 - j) \frac{1}{10^r} \quad \text{for } \frac{b}{3} + 1 \leq j \leq \frac{2b}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 17 - j) \frac{1}{10^r} \quad \text{for } \frac{2b}{3} + 1 \leq j \leq b$$

Subcase (iii)b If $b \equiv 1(\text{mod } 3)$

$$\sigma(z_j) = (m + n + a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{b-1}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 18 - j) \frac{1}{10^r} \quad \text{for } \left(\frac{b-1}{3}\right) + 1 \leq j \leq \frac{2b+1}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 17 - j) \frac{1}{10^r} \quad \text{for } \left(\frac{2b+1}{3}\right) + 1 \leq j \leq b$$

Subcase (iii)c If $b \equiv 2(\text{mod } 3)$

$$\sigma(z_j) = (m + n + a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{b-1}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 18 - j) \frac{1}{10^r} \quad \text{for } \left(\frac{b-1}{3}\right) + 1 \leq j \leq \frac{2b-1}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 17 - j) \frac{1}{10^r} \quad \text{for } \left(\frac{2b-1}{3}\right) + 1 \leq j \leq b$$

The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$ are tabulated in Table no 3.

Table no 3: The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$.

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
$m \equiv 0(\text{mod } 3), n \equiv 0(\text{mod } 3), a \equiv 2(\text{mod } 3)$	$b \equiv 0(\text{mod } 3)$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a+1}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+7}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n}{3} + 1 \leq j \leq \frac{2n}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a+1}{3} + 1 \leq j \leq \frac{2a-1}{3}$ $g(v_5z_j)$ if $\frac{b}{3} + 1 \leq j \leq \frac{2b}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+4}{3}$ for $i = 2$

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a-1}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+4}{3}$ for $i = 3$
	$b \equiv 1 \pmod{3}$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a+1}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b-1}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+6}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n}{3} + 1 \leq j \leq \frac{2n}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a+1}{3} + 1 \leq j \leq \frac{2a-1}{3}$ $g(v_5z_j)$ if $\frac{b-1}{3} + 1 \leq j \leq \frac{2b+1}{3}$ $g(v_4z_i)$ if $\frac{l}{3} + 1 \leq i \leq \frac{2l}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+6}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a-1}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b+1}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $\frac{2l}{3} + 1 \leq i \leq l$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+3}{3}$ for $i = 3$
	$b \equiv 2 \pmod{3}$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a+1}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b-1}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+5}{3}$ for $i = 1$

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n}{3} + 1 \leq j \leq \frac{2n}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a+1}{3} + 1 \leq j \leq \frac{2a-1}{3}$ $g(v_5z_j)$ if $\frac{b-1}{3} + 1 \leq j \leq \frac{2b-1}{3}$ $g(v_4z_i)$ if $\frac{l}{3} + 1 \leq i \leq \frac{2l}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+5}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a-1}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b-1}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $\frac{2l}{3} + 1 \leq i \leq l$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+5}{3}$ for $i = 3$

Subcase (iv) If $n \equiv 1(mod 3)$, $a \equiv 0(mod 3)$

$$\begin{aligned} \sigma(x_j) &= (m + 2n + 2a + 2b + 23 - j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{n-1}{3} \\ \sigma(x_j) &= (m + 2n + 2a + 2b + 22 - j) \frac{1}{10^r} & \text{for } \frac{n-1}{3} + 1 \leq j \leq \frac{2(n-1)}{3} \\ \sigma(x_j) &= (m + 2n + 2a + 2b + 21 - j) \frac{1}{10^r} & \text{for } \frac{2(n-1)}{3} + 1 \leq j \leq n \\ \sigma(y_j) &= (m + n + 2a + 2b + 21 - j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{a}{3} \\ \sigma(y_j) &= (m + n + 2a + 2b + 20 - j) \frac{1}{10^r} & \text{for } \frac{a}{3} + 1 \leq j \leq \frac{2a}{3} \\ \sigma(y_j) &= (m + n + 2a + 2b + 19 - j) \frac{1}{10^r} & \text{for } \frac{2a}{3} + 1 \leq j \leq a \end{aligned}$$

Subcase (iv)a If $b \equiv 0(mod 3)$

$$\begin{aligned} \sigma(z_j) &= (m + n + a + 2b + 19 - j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{b}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 18 - j) \frac{1}{10^r} & \text{for } \frac{b}{3} + 1 \leq j \leq \frac{2b}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 17 - j) \frac{1}{10^r} & \text{for } \frac{2b}{3} + 1 \leq j \leq b \end{aligned}$$

Subcase (iv)b If $b \equiv 1(mod 3)$

$$\begin{aligned} \sigma(z_j) &= (m + n + a + 2b + 19 - j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{b+2}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 18 - j) \frac{1}{10^r} & \text{for } (\frac{b+2}{3}) + 1 \leq j \leq \frac{2b+1}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 17 - j) \frac{1}{10^r} & \text{for } (\frac{2b+1}{3}) + 1 \leq j \leq b \end{aligned}$$

Subcase (iv)c If $b \equiv 2(mod 3)$

$$\begin{aligned} \sigma(z_j) &= (m + n + a + 2b + 19 - j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{b+1}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 18 - j) \frac{1}{10^r} & \text{for } (\frac{b+1}{3}) + 1 \leq j \leq \frac{2(b+1)}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 17 - j) \frac{1}{10^r} & \text{for } \frac{2(b+1)}{3} + 1 \leq j \leq b \end{aligned}$$

The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$ are tabulated below in Table no 4.

Table no 4: The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$.

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
$m \equiv 0 \pmod{3}, n \equiv 1 \pmod{3}, a \equiv 0 \pmod{3}$	$b \equiv 0 \pmod{3}$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n-1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+5}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n-1}{3} + 1 \leq j \leq \frac{2(n-1)}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a}{3} + 1 \leq j \leq \frac{2a}{3}$ $g(v_5z_j)$ if $\frac{b}{3} + 1 \leq j \leq \frac{2b}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+5}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2(n-1)}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+5}{3}$ for $i = 3$
	$b \equiv 1 \pmod{3}$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n-1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b+2}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+7}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n-1}{3} + 1 \leq j \leq \frac{2(n-1)}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a}{3} + 1 \leq j \leq \frac{2a}{3}$ $g(v_5z_j)$ if $\frac{b+2}{3} + 1 \leq j \leq \frac{2b+1}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+4}{3}$ for $i = 2$

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2(n-1)}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b+1}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+4}{3}$ for $i = 3$
	$b \equiv 2(mod 3)$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n-1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b+1}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+6}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n-1}{3} + 1 \leq j \leq \frac{2(n-1)}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a}{3} + 1 \leq j \leq \frac{2a}{3}$ $g(v_5z_j)$ if $\frac{b+1}{3} + 1 \leq j \leq \frac{2(b+1)}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+6}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2(n-1)}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2(b+1)}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+3}{3}$ for $i = 3$

Subcase (v) If $n \equiv 1(mod 3)$, $a \equiv 1(mod 3)$

$$\sigma(x_j) = (m + 2n + 2a + 2b + 23 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{n-1}{3}$$

$$\sigma(x_j) = (m + 2n + 2a + 2b + 22 - j) \frac{1}{10^r} \quad \text{for } \frac{n-1}{3} + 1 \leq j \leq \frac{2(n-1)}{3}$$

$$\sigma(x_j) = (m + 2n + 2a + 2b + 21 - j) \frac{1}{10^r} \quad \text{for } \frac{2(n-1)}{3} + 1 \leq j \leq n$$

$$\sigma(y_j) = (m + n + 2a + 2b + 21 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{a+2}{3}$$

$$\sigma(y_j) = (m + n + 2a + 2b + 20 - j) \frac{1}{10^r} \quad \text{for } (\frac{a+2}{3}) + 1 \leq j \leq \frac{2a+1}{3}$$

$$\sigma(y_j) = (m + n + 2a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } (\frac{2a+1}{3}) + 1 \leq j \leq a$$

Subcase (v)a If $b \equiv 0(mod 3)$

$$\begin{aligned}\sigma(z_j) &= (m+n+a+2b+19-j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{b}{3} \\ \sigma(z_j) &= (m+n+a+2b+18-j) \frac{1}{10^r} & \text{for } \frac{b}{3} + 1 \leq j \leq \frac{2b}{3} \\ \sigma(z_j) &= (m+n+a+2b+17-j) \frac{1}{10^r} & \text{for } \frac{2b}{3} + 1 \leq j \leq b\end{aligned}$$

Subcase (v)b If $b \equiv 1(mod 3)$

$$\begin{aligned}\sigma(z_j) &= (m+n+a+2b+19-j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{b-1}{3} \\ \sigma(z_j) &= (m+n+a+2b+18-j) \frac{1}{10^r} & \text{for } (\frac{b-1}{3}) + 1 \leq j \leq \frac{2b+1}{3} \\ \sigma(z_j) &= (m+n+a+2b+17-j) \frac{1}{10^r} & \text{for } (\frac{2b+1}{3}) + 1 \leq j \leq b\end{aligned}$$

Subcase (v)c If $b \equiv 2(mod 3)$

$$\begin{aligned}\sigma(z_j) &= (m+n+a+2b+19-j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{b-1}{3} \\ \sigma(z_j) &= (m+n+a+2b+18-j) \frac{1}{10^r} & \text{for } (\frac{b-1}{3}) + 1 \leq j \leq \frac{2b-1}{3} \\ \sigma(z_j) &= (m+n+a+2b+17-j) \frac{1}{10^r} & \text{for } (\frac{2b-1}{3}) + 1 \leq j \leq b\end{aligned}$$

The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$ are tabulated in Table no 5.

Table no 5: The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$.

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
$m \equiv 0(mod 3), n \equiv 1(mod 3), a \equiv 1(mod 3)$	$b \equiv 0(mod 3)$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n-1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a+2}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b}{3}$	$(4m+4n+4a+4b+62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+7}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n-1}{3} + 1 \leq j \leq \frac{2(n-1)}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a+2}{3} + 1 \leq j \leq \frac{2a+1}{3}$ $g(v_5z_j)$ if $\frac{b}{3} + 1 \leq j \leq \frac{2b}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m+4n+4a+4b+61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+4}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2(n-1)}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a+1}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m+4n+4a+4b+60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+4}{3}$ for $i = 3$

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
	$b \equiv 1(mod\ 3)$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n-1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a+2}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b-1}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+6}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n-1}{3} + 1 \leq j \leq \frac{2(n-1)}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a+2}{3} + 1 \leq j \leq \frac{2a+1}{3}$ $g(v_5z_j)$ if $\frac{b-1}{3} + 1 \leq j \leq \frac{2b+1}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+6}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2(n-1)}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a+1}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b+1}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+3}{3}$ for $i = 3$
	$b \equiv 2(mod\ 3)$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n-1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a+2}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b-1}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+5}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n-1}{3} + 1 \leq j \leq \frac{2(n-1)}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a+2}{3} + 1 \leq j \leq \frac{2a+1}{3}$ $g(v_5z_j)$ if $\frac{b-1}{3} + 1 \leq j \leq \frac{2b-1}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+5}{3}$ for $i = 2$

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2(n-1)}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a+1}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b-1}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+5}{3}$ for $i = 3$

Subcase (vi) If $n \equiv 1(mod\ 3)$, $a \equiv 2(mod\ 3)$

$$\begin{aligned} \sigma(x_j) &= (m + 2n + 2a + 2b + 23 - j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{n-1}{3} \\ \sigma(x_j) &= (m + 2n + 2a + 2b + 22 - j) \frac{1}{10^r} & \text{for } \frac{n-1}{3} + 1 \leq j \leq \frac{2(n-1)}{3} \\ \sigma(x_j) &= (m + 2n + 2a + 2b + 21 - j) \frac{1}{10^r} & \text{for } \frac{2(n-1)}{3} + 1 \leq j \leq n \\ \sigma(y_j) &= (m + n + 2a + 2b + 21 - j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{a+1}{3} \\ \sigma(y_j) &= (m + n + 2a + 2b + 20 - j) \frac{1}{10^r} & \text{for } (\frac{a+1}{3}) + 1 \leq j \leq \frac{2(a+1)}{3} \\ \sigma(y_j) &= (m + n + 2a + 2b + 19 - j) \frac{1}{10^r} & \text{for } \frac{2(a+1)}{3} + 1 \leq j \leq a \end{aligned}$$

Subcase (vi)a If $b \equiv 0(mod\ 3)$

$$\begin{aligned} \sigma(z_j) &= (m + n + a + 2b + 19 - j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{b}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 18 - j) \frac{1}{10^r} & \text{for } \frac{b}{3} + 1 \leq j \leq \frac{2b}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 17 - j) \frac{1}{10^r} & \text{for } \frac{2b}{3} + 1 \leq j \leq b \end{aligned}$$

Subcase (vi)b If $b \equiv 1(mod\ 3)$

$$\begin{aligned} \sigma(z_j) &= (m + n + a + 2b + 19 - j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{b-1}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 18 - j) \frac{1}{10^r} & \text{for } \frac{b-1}{3} + 1 \leq j \leq \frac{2(b-1)}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 17 - j) \frac{1}{10^r} & \text{for } \frac{2(b-1)}{3} + 1 \leq j \leq b \end{aligned}$$

Subcase (vi)c If $b \equiv 2(mod\ 3)$

$$\begin{aligned} \sigma(z_j) &= (m + n + a + 2b + 19 - j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{b+1}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 18 - j) \frac{1}{10^r} & \text{for } (\frac{b+1}{3}) + 1 \leq j \leq \frac{2b-1}{3} \\ \sigma(z_j) &= (m + n + a + 2b + 17 - j) \frac{1}{10^r} & \text{for } (\frac{2b-1}{3}) + 1 \leq j \leq b \end{aligned}$$

The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$ are tabulated in Table no 6.

Table no 6: The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$.

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
$m \equiv 0 \pmod{3}, n \equiv 1 \pmod{3}, a \equiv 2 \pmod{3}$	$b \equiv 0 \pmod{3}$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n-1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a+1}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+6}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n-1}{3} + 1 \leq j \leq \frac{2(n-1)}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a+1}{3} + 1 \leq j \leq \frac{2(a+1)}{3}$ $g(v_5z_j)$ if $\frac{b}{3} + 1 \leq j \leq \frac{2b}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+6}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2(n-1)}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2(a+1)}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+3}{3}$ for $i = 3$
	$b \equiv 1 \pmod{3}$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n-1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a+1}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b-1}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+5}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n-1}{3} + 1 \leq j \leq \frac{2(n-1)}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a+1}{3} + 1 \leq j \leq \frac{2(a+1)}{3}$ $g(v_5z_j)$ if $\frac{b-1}{3} + 1 \leq j \leq \frac{2(b-1)}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+5}{3}$ for $i = 2$

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2(n-1)}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2(a+1)}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2(b-1)}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+5}{3}$ for $i = 3$
	$b \equiv 2(mod 3)$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n-1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a+1}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b+1}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+7}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n-1}{3} + 1 \leq j \leq \frac{2(n-1)}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a+1}{3} + 1 \leq j \leq \frac{2(a+1)}{3}$ $g(v_5z_j)$ if $\frac{b+1}{3} + 1 \leq j \leq \frac{2b-1}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+4}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2(n-1)}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2(a+1)}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b-1}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+4}{3}$ for $i = 3$

Subcase (vii) If $n \equiv 2(mod 3)$, $a \equiv 0(mod 3)$

$$\sigma(x_j) = (m + 2n + 2a + 2b + 23 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{n+1}{3}$$

$$\sigma(x_j) = (m + 2n + 2a + 2b + 22 - j) \frac{1}{10^r} \quad \text{for } (\frac{n+1}{3}) + 1 \leq j \leq \frac{2n-1}{3}$$

$$\sigma(x_j) = (m + 2n + 2a + 2b + 21 - j) \frac{1}{10^r} \quad \text{for } (\frac{2n-1}{3}) + 1 \leq j \leq n$$

$$\sigma(y_j) = (m + n + 2a + 2b + 21 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{a}{3}$$

$$\sigma(y_j) = (m + n + 2a + 2b + 20 - j) \frac{1}{10^r} \quad \text{for } \frac{a}{3} + 1 \leq j \leq \frac{2a}{3}$$

$$\sigma(y_j) = (m + n + 2a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } \frac{2a}{3} + 1 \leq j \leq a$$

Subcase (vii)a If $b \equiv 0 \pmod{3}$

$$\begin{aligned}\sigma(z_j) &= (m+n+a+2b+19-j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{b}{3} \\ \sigma(z_j) &= (m+n+a+2b+18-j) \frac{1}{10^r} & \text{for } \frac{b}{3}+1 \leq j \leq \frac{2b}{3} \\ \sigma(z_j) &= (m+n+a+2b+17-j) \frac{1}{10^r} & \text{for } \frac{2b}{3}+1 \leq j \leq b\end{aligned}$$

Subcase (vii)b If $b \equiv 1 \pmod{3}$

$$\begin{aligned}(z_j) &= (m+n+a+2b+19-j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{b-1}{3} \\ \sigma(z_j) &= (m+n+a+2b+18-j) \frac{1}{10^r} & \text{for } (\frac{b-1}{3})+1 \leq j \leq \frac{2b+1}{3} \\ \sigma(z_j) &= (m+n+a+2b+17-j) \frac{1}{10^r} & \text{for } (\frac{2b+1}{3})+1 \leq j \leq b\end{aligned}$$

Subcase (vii)c If $b \equiv 2 \pmod{3}$

$$\begin{aligned}\sigma(z_j) &= (m+n+a+2b+19-j) \frac{1}{10^r} & \text{for } 1 \leq j \leq \frac{b-1}{3} \\ \sigma(z_j) &= (m+n+a+2b+18-j) \frac{1}{10^r} & \text{for } (\frac{b-1}{3})+1 \leq j \leq \frac{2b-1}{3} \\ \sigma(z_j) &= (m+n+a+2b+17-j) \frac{1}{10^r} & \text{for } (\frac{2b-1}{3})+1 \leq j \leq b\end{aligned}$$

The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$ are tabulated in Table no 7.

Table no 7: The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$.

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
$m \equiv 0 \pmod{3}, n \equiv 2 \pmod{3}, a \equiv 0 \pmod{3}$	$b \equiv 0 \pmod{3}$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n+1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b}{3}$	$(4m+4n+4a+4b+62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+7}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3}+1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n+1}{3}+1 \leq j \leq \frac{2n-1}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a}{3}+1 \leq j \leq \frac{2a}{3}$ $g(v_5z_j)$ if $\frac{b}{3}+1 \leq j \leq \frac{2b}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m+4n+4a+4b+61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+4}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3}+1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n-1}{3}+1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a}{3}+1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b}{3}+1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m+4n+4a+4b+60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+4}{3}$ for $i = 3$

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
	$b \equiv 1 \pmod{3}$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n+1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b-1}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+6}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n+1}{3} + 1 \leq j \leq \frac{2n-1}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a}{3} + 1 \leq j \leq \frac{2a}{3}$ $g(v_5z_j)$ if $\frac{b-1}{3} + 1 \leq j \leq \frac{2b+1}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+6}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n-1}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b+1}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+3}{3}$ for $i = 3$
	$b \equiv 2 \pmod{3}$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n+1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b-1}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+5}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n+1}{3} + 1 \leq j \leq \frac{2n-1}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a}{3} + 1 \leq j \leq \frac{2a}{3}$ $g(v_5z_j)$ if $\frac{b-1}{3} + 1 \leq j \leq \frac{2b-1}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+5}{3}$ for $i = 2$

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n-1}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b-1}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+5}{3}$ for $i = 3$

Subcase (viii) If $n \equiv 2(mod\ 3)$, $a \equiv 1(mod\ 3)$

$$\sigma(x_j) = (m + 2n + 2a + 2b + 23 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{n+1}{3}$$

$$\sigma(x_j) = (m + 2n + 2a + 2b + 22 - j) \frac{1}{10^r} \quad \text{for } (\frac{n+1}{3}) + 1 \leq j \leq \frac{2n-1}{3}$$

$$\sigma(x_j) = (m + 2n + 2a + 2b + 21 - j) \frac{1}{10^r} \quad \text{for } (\frac{2n-1}{3}) + 1 \leq j \leq n$$

$$\sigma(y_j) = (m + n + 2a + 2b + 21 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{a-1}{3}$$

$$\sigma(y_j) = (m + n + 2a + 2b + 20 - j) \frac{1}{10^r} \quad \text{for } (\frac{a-1}{3}) + 1 \leq j \leq \frac{2a+1}{3}$$

$$\sigma(y_j) = (m + n + 2a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } (\frac{2a+1}{3}) + 1 \leq j \leq a$$

Subcase (viii)a If $b \equiv 0(mod\ 3)$

$$\sigma(z_j) = (m + n + a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{b}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 18 - j) \frac{1}{10^r} \quad \text{for } \frac{b}{3} + 1 \leq j \leq \frac{2b}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 17 - j) \frac{1}{10^r} \quad \text{for } \frac{2b}{3} + 1 \leq j \leq b$$

Subcase (viii)b If $b \equiv 1(mod\ 3)$

$$\sigma(z_j) = (m + n + a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{b-1}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 18 - j) \frac{1}{10^r} \quad \text{for } \frac{b-1}{3} + 1 \leq j \leq \frac{2(b-1)}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 17 - j) \frac{1}{10^r} \quad \text{for } \frac{2(b-1)}{3} + 1 \leq j \leq b$$

Subcase (viii)c If $b \equiv 2(mod\ 3)$

$$\sigma(z_j) = (m + n + a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{b+1}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 18 - j) \frac{1}{10^r} \quad \text{for } (\frac{b+1}{3}) + 1 \leq j \leq \frac{2b-1}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 17 - j) \frac{1}{10^r} \quad \text{for } (\frac{2b-1}{3}) + 1 \leq j \leq b$$

The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$ are tabulated in Table no 8.

Table no 8: The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$.

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
$m \equiv 0(mod 3), n \equiv 2(mod 3), a \equiv 1(mod 3)$	$b \equiv 0(mod 3)$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n+1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a-1}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+6}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n+1}{3} + 1 \leq j \leq \frac{2n-1}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a-1}{3} + 1 \leq j \leq \frac{2a+1}{3}$ $g(v_5z_j)$ if $\frac{b}{3} + 1 \leq j \leq \frac{2b}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+6}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n-1}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a+1}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+3}{3}$ for $i = 3$
	$b \equiv 1(mod 3)$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n+1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a-1}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b-1}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+5}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n+1}{3} + 1 \leq j \leq \frac{2n-1}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a-1}{3} + 1 \leq j \leq \frac{2a+1}{3}$ $g(v_5z_j)$ if $\frac{b-1}{3} + 1 \leq j \leq \frac{2(b-1)}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+5}{3}$ for $i = 2$

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n-1}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a+1}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2(b-1)}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+5}{3}$ for $i = 3$
	$b \equiv 2(mod 3)$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n+1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a-1}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b+1}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+7}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n+1}{3} + 1 \leq j \leq \frac{2n-1}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a-1}{3} + 1 \leq j \leq \frac{2a+1}{3}$ $g(v_5z_j)$ if $\frac{b+1}{3} + 1 \leq j \leq \frac{2b-1}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+4}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n-1}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a+1}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b-1}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+4}{3}$ for $i = 3$

Subcase (ix) If $n \equiv 2(mod 3), a \equiv 2(mod 3)$

$$\sigma(x_j) = (m + 2n + 2a + 2b + 23 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{n+1}{3}$$

$$\sigma(x_j) = (m + 2n + 2a + 2b + 22 - j) \frac{1}{10^r} \quad \text{for } (\frac{n+1}{3}) + 1 \leq j \leq \frac{2n-1}{3}$$

$$\sigma(x_j) = (m + 2n + 2a + 2b + 21 - j) \frac{1}{10^r} \quad \text{for } (\frac{2n-1}{3}) + 1 \leq j \leq n$$

$$\sigma(y_j) = (m + n + 2a + 2b + 21 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{a-1}{3}$$

$$\sigma(y_j) = (m + n + 2a + 2b + 20 - j) \frac{1}{10^r} \quad \text{for } (\frac{a-1}{3}) + 1 \leq j \leq \frac{2a-1}{3}$$

$$\sigma(y_j) = (m + n + 2a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } (\frac{2a-1}{3}) + 1 \leq j \leq a$$

Subcase (ix)a If $b \equiv 0(mod 3)$

$$\sigma(z_j) = (m + n + a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{b}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 18 - j) \frac{1}{10^r} \quad \text{for } \frac{b}{3} + 1 \leq j \leq \frac{2b}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 17 - j) \frac{1}{10^r} \quad \text{for } \frac{2b}{3} + 1 \leq j \leq b$$

Subcase (ix)b If $b \equiv 1(\text{mod } 3)$

$$\sigma(z_j) = (m + n + a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{b+2}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 18 - j) \frac{1}{10^r} \quad \text{for } \left(\frac{b+2}{3}\right) + 1 \leq j \leq \frac{2b+1}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 17 - j) \frac{1}{10^r} \quad \text{for } \left(\frac{2b+1}{3}\right) + 1 \leq j \leq b$$

Subcase (ix)c If $b \equiv 2(\text{mod } 3)$

$$\sigma(z_j) = (m + n + a + 2b + 19 - j) \frac{1}{10^r} \quad \text{for } 1 \leq j \leq \frac{b+1}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 18 - j) \frac{1}{10^r} \quad \text{for } \left(\frac{b+1}{3}\right) + 1 \leq j \leq \frac{2(b+1)}{3}$$

$$\sigma(z_j) = (m + n + a + 2b + 17 - j) \frac{1}{10^r} \quad \text{for } \frac{2(b+1)}{3} + 1 \leq j \leq b$$

The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$ are tabulated in Table no 9.

Table no 9: The magic membership values of K_i 's, $1 \leq i \leq 3$ and number of K_i 's, $1 \leq i \leq 3$.

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
$m \equiv 0(\text{mod } 3), n \equiv 2(\text{mod } 3), a \equiv 2(\text{mod } 3)$	$b \equiv 0(\text{mod } 3)$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n+1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a-1}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+5}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n+1}{3} + 1 \leq j \leq \frac{2n-1}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a-1}{3} + 1 \leq j \leq \frac{2a-1}{3}$ $g(v_5z_j)$ if $\frac{b}{3} + 1 \leq j \leq \frac{2b}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+5}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n-1}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a-1}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+5}{3}$ for $i = 3$

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
	$b \equiv 1 \pmod{3}$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n+1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a-1}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b+2}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+7}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n+1}{3} + 1 \leq j \leq \frac{2n-1}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a-1}{3} + 1 \leq j \leq \frac{2a-1}{3}$ $g(v_5z_j)$ if $\frac{b+2}{3} + 1 \leq j \leq \frac{2b+1}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+4}{3}$ for $i = 2$
		$g(v_2w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3x_j)$ if $\frac{2n-1}{3} + 1 \leq j \leq n$ $g(v_5v_6)$ $g(v_4y_j)$ if $\frac{2a-1}{3} + 1 \leq j \leq a$ $g(v_5z_j)$ if $\frac{2b+1}{3} + 1 \leq j \leq b$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10^r}$ for $i = 3$	$\frac{m+n+a+b+4}{3}$ for $i = 3$
	$b \equiv 2 \pmod{3}$	$g(v_2w_j)$ if $1 \leq j \leq \frac{m}{3}$ $g(v_3x_j)$ if $1 \leq j \leq \frac{n+1}{3}$ $g(v_1v_2), g(v_2v_3)$ $g(v_4y_j)$ if $1 \leq j \leq \frac{a-1}{3}$ $g(v_5z_j)$ if $1 \leq j \leq \frac{b+1}{3}$	$(4m + 4n + 4a + 4b + 62) \frac{1}{10^r}$ for $i = 1$	$\frac{m+n+a+b+6}{3}$ for $i = 1$
		$g(v_2w_j)$ if $\frac{m}{3} + 1 \leq j \leq \frac{2m}{3}$ $g(v_3x_j)$ if $\frac{n+1}{3} + 1 \leq j \leq \frac{2n-1}{3}$ $g(v_3v_4), g(v_4v_5)$ $g(v_4y_j)$ if $\frac{a-1}{3} + 1 \leq j \leq \frac{2a-1}{3}$ $g(v_5z_j)$ if $\frac{b+1}{3} + 1 \leq j \leq \frac{2(b+1)}{3}$ $g(v_4z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 61) \frac{1}{10^r}$ for $i = 2$	$\frac{m+n+a+b+6}{3}$ for $i = 2$

Nature of m, n, a	Nature of b	Edges	MMV K_i 's, $1 \leq i \leq 3$	Number of K_i 's, $1 \leq i \leq 3$
		$g(v_2 w_j)$ if $\frac{2m}{3} + 1 \leq j \leq m$ $g(v_3 x_j)$ if $\frac{2n-1}{3} + 1 \leq j \leq n$ $g(v_5 v_6)$ $g(v_4 y_j)$ if $\frac{2a-1}{3} + 1 \leq j \leq a$ $g(v_5 z_j)$ if $\frac{2(b+1)}{3} + 1 \leq j \leq b$ $g(v_4 z_i)$ if $1 \leq i \leq \frac{l}{3}$	$(4m + 4n + 4a + 4b + 60) \frac{1}{10r}$ for $i = 3$	$\frac{m+n+a+b+3}{3}$ for $i = 3$

IV. Conclusion

In this paper, we have shown that the non-isomorphic trees of diameter 5 are fuzzy tri-magic. In this paper, we have given only for $m \equiv 0(mod 3)$. All the remaining cases of trees of diameter 5 are also done by us.

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