Fuzzy Tri-Magic Labeling of Generalized Jahangir Graph

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Abstract: 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 and K_j's $(1 \leq i \leq 3)$ differs by atmost 1 and $|K_i - K_j| \leq \frac{2}{10^r}$ for 1≤ i, j ≤ 3, r ≥ 2. 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 $\tilde{T}m_0G$. In this paper it isproved that the generalized Jahangir graph $JG_{n,m}$is Fuzzy tri-magic $n \geq 2$ and $m \geq 3$.
Keywords: Membership values, Fuzzy Tri-Magic Labeling,Jahangir graph

1. Introduction

The graphs considered here are finite, simple, undirected and non trivial(Gallian J. A.,2017). Graph theory has a good development in the graph labeling and has a broad range of applications (Harary F, 2013). 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. The generalized Jahangir graph $JG_{n,m}$for $n \geq 2$ and $m \geq 3$is a graph on $nm + 1$vertices, consisting of a cycle $C_{nm}$with one additional vertex that is adjacent to m vertices of C_{nm} at distance n to each other on C_{nm}. In this paper it is proved that the generalized Jahangir graph $JG_{n,m}$is Fuzzy tri-magicfor$n \geq 2$ and $m \geq 3$.

2. Definitions

Definition 2.1 Fuzzy graph

A fuzzy graph $G: (\sigma, \mu)$ is a non-empty set V together with a pair of functions $\sigma : V \to [0, 1]$ and $\mu : V \times V \to [0, 1]$, such that for all $u, v \in V$, $\mu(u, v) \leq \sigma(u) \wedge \sigma(v)$, where σ is the fuzzy vertex set of G and μ is the fuzzy edge set of G, respectively.

Definition 2.2 Fuzzy Labeling

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

Definition 2.3 Magic membership value

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

Definition 2.4 Fuzzy tri-magic labeling

A fuzzy graph is said to admit tri-magic labeling if the MMVs K_i's $(1 \leq i \leq 3)$ are constants where the number of K_i's and K_j's differs by at most 1 and $|K_i - K_j| \leq \frac{2}{10^r}$ for 1≤ i, j ≤ 3, r ≥ 2 (Sumathi P&Monigeetha C, 2019).

Definition 2.5 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 2.6Jahangir graph

The Generalized Jahangir graph $JG_{n,m}$for $n \geq 2, m \geq 3$ is a graph on $nm + 1$ vertices, consisting of a cycle C_{nm} with one additional vertex that is adjacent to m vertices of C_{nm} at distance n to each other on C_{nm}(Anantha Lakshmi R et al., 2018&Celin Mary V et al., 2014).

3. Main Result

Theorem 3.1: The Generalized Jahangir graph $JG_{n,m}$for $n \geq 2, m \geq 3$admits fuzzy edge tri-magic labeling.

Proof:

Let G be aGeneralized Jahangir graph$JG_{n,m}$

$|V(G)| = nm + 1$ and $|E(G)| = m(n + 1)$.

Let the vertex set and edge set of G be$V(G) = \{ v, v_1, v_2, v_3, \dots, v_{nm}\}$and

$E(G) = \{v_j v_{j+1}: 1 \leq j \leq nm - 1\} \cup \{v_1 v_{nm}\} \cup \{v_{1+n(j-1)}: 1 \leq j \leq m\}$.

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

We define $\sigma : V \to [0,1]$ and $\mu : V \times V \to [0,1]$ such that

Case (i) If n is even

Subcase (i) If $m(n + 1) = 3S,\ S \geq 1$

$\mu(v\, v_{1+n(j-1)}) = \frac{(j-1)2n+1}{10^r}for1 \leq j \leq m$

$\mu(v_j v_{j+1}) = \frac{3+(j-1)4}{10^r}for1 \leq j \leq \frac{m(n+1)}{3}$

Subcase (i)a If $n = 2$

$\mu(v_j v_{j+1}) = \frac{4+(j-1)4}{10^r}$for $\frac{m(n+1)}{3} + 1 \leq j \leq nm - 1$

$\mu(v_1 v_{nm}) = \frac{2nm}{10^r}$

$\sigma(v_j) = \frac{6nm-2-2j}{10^r}$ if $1 \leq j \leq nm$

$\sigma(v) = \frac{6nm - 2}{10^r}$

By the definition of MMV:

$K_1 = \frac{12nm-5}{10^r}$, $K_2 = \frac{12nm-6}{10^r}$ and $K_3 = \frac{12nm-7}{10^r}$

$|K_1| = |K_2| = |K_3| = \frac{m(n+1)}{3}$

Subcase (i)b If $n > 2$

$\mu(v_j v_{j+1}) = \frac{4+(j-1)4}{10^r}for\frac{m(n+1)}{3} + 1 \leq j \leq \frac{2}{3}\,(m(n + 1))$

$\mu(v_j v_{j+1}) = \frac{5+(j-1)4}{10^r}for\frac{2}{3}(m(n + 1)) + 1 \leq j \leq nm - 1$

$\mu(v_1 v_{nm}) = \frac{2nm + 1}{10^r}$

$\sigma(v_j) = \frac{6nm-1-2j}{10^r}for1 \leq j \leq nm$

$\sigma(v) = \frac{6nm - 1}{10^r}$

By the definition of MMV:

$K_1 = \frac{12nm-3}{10^r}$, $K_2 = \frac{12nm-4}{10^r}$ and $K_3 = \frac{12nm-5}{10^r}$

$|K_1| = |K_2| = |K_3| = \frac{m(n+1)}{3}$

Subcase (ii) If$m(n + 1) = 3S + 1,\ S \geq 1$

$\mu(v\, v_{1+n(j-1)}) = \frac{(j-1)2n+1}{10^r}for1 \leq j \leq m$

$\mu(v_j v_{j+1}) = \frac{3+(j-1)4}{10^r}$for $1 \leq j \leq \frac{m(n+1)-1}{3}$

$\mu(v_j v_{j+1}) = \frac{4+(j-1)4}{10^r}$ for $\frac{m(n+1)-1}{3} + 1 \leq j \leq \frac{2}{3}(m(n+1)-1)$
$\mu(v_j v_{j+1}) = \frac{5+(j-1)4}{10^r}$ for $\frac{2}{3}(m(n+1)-1)+1 \leq j \leq nm-1$
$\mu(v_1 v_{nm}) = \frac{2nm+1}{10^r}$
$\sigma(v_j) = \frac{6nm-1-2j}{10^r}$ for $1 \leq j \leq nm$
$\sigma(v) = \frac{6nm-1}{10^r}$

By the definition of MMV:
$K_1 = \frac{12nm-3}{10^r}$, $K_2 = \frac{12nm-4}{10^r}$ and $K_3 = \frac{12nm-5}{10^r}$
$|K_1| = \frac{m(n+1)+2}{3}$ and $|K_2| = |K_3| = \frac{m(n+1)-1}{3}$

Subcase (iii) If $m(n+1) = 3S+2,\ S \geq 1$
$\mu(v\, v_{1+n(j-1)}) = \frac{(j-1)2n+1}{10^r}$ for $1 \leq j \leq m$
$\mu(v_j v_{j+1}) = \frac{3+(j-1)4}{10^r}$ for $1 \leq j \leq \frac{m(n+1)+1}{3}$
$\mu(v_j v_{j+1}) = \frac{4+(j-1)4}{10^r}$ for $\frac{m(n+1)+1}{3} + 1 \leq j \leq \frac{2}{3}(m(n+1)+1)$
$\mu(v_j v_{j+1}) = \frac{5+(j-1)4}{10^r}$ for $\frac{2}{3}(m(n+1)+1)+1 \leq j \leq nm-1$
$\mu(v_1 v_{nm}) = \frac{2nm+1}{10^r}$
$\sigma(v_j) = \frac{6nm-1-2j}{10^r}$ for $1 \leq j \leq nm$
$\sigma(v) = \frac{6nm-1}{10^r}$
By the definition of MMV:
$K_1 = \frac{12nm-3}{10^r}$, $K_2 = \frac{12nm-4}{10^r}$ and $K_3 = \frac{12nm-5}{10^r}$
$|K_1| = \frac{m(n+1)-2}{3}$ and $|K_2| = |K_3| = \frac{m(n+1)+1}{3}$

MMVs K_i's, their corresponding edges and number of K_i's ($1 \leq i \leq 3$) are given in Table 1.

Table.1. MMVs K_i's, their corresponding edges and the number of K_i's ($1 \leq i \leq 3$).

Nature of $m(n+1)$	**Edges**	**MMV $K_i's$, 1≤ i ≤ 3**	**Number of $K_i's$, 1≤ i ≤3**
$m(n+1) = 3S$, $S \geq 1$ and for n= 2	$g(v\, v_{1+n(j-1)})$ for $1 \leq j \leq m$	$(12nm-5)\frac{1}{10^r}$ for i= 1	$\frac{m(n+1)}{3}$ for i= 1
	$g(v_j v_{j+1})$ for $1 \leq j \leq \frac{m(n+1)}{3}$	$(12nm-7)\frac{1}{10^r}$ for i= 3	$\frac{m(n+1)}{3}$ for i = 3
	$g(v_j v_{j+1})$ for $\frac{m(n+1)}{3} + 1 \leq j \leq nm-1$ $g(v_1 v_{nm})$	$(12nm-6)\frac{1}{10^r}$ for i= 2	$\frac{m(n+1)}{3}$ for i = 2

$m(n+1)=3S$, $S\geq 1$ and for n>2	$g(v\,v_{1+n(j-1)})$for$1\leq j\leq m$ $g(v_jv_{j+1})$ for$\frac{2}{3}(m(n+1))+1\leq j\leq nm-1$ $g(v_1v_{nm})$	$(12\text{nm}-3)\frac{1}{10^r}$ for i = 1	$\frac{m(n+1)}{3}$ for i = 1
	$g(v_jv_{j+1})$ for$1\leq j\leq \frac{m(n+1)}{3}$	$(12\text{nm}-5)\frac{1}{10^r}$ for i = 3	$\frac{m(n+1)}{3}$ for i = 3
	$g(v_jv_{j+1})$ for$\frac{m(n+1)}{3}+1\leq j\leq \frac{2}{3}(m(n+1))$	$(12\text{nm}-4)\frac{1}{10^r}$ for i = 2	$\frac{m(n+1)}{3}$ for i= 2
$m(n+1)=3S+1$, $S\geq 1$	$g(v\,v_{1+n(j-1)})$for$1\leq j\leq m$ $g(v_jv_{j+1})$ for$\frac{2}{3}(m(n+1)-1)+1\leq j\leq nm-1$ $g(v_1v_{nm})$	$(12\text{nm}-3)\frac{1}{10^r}$ for i = 1	$\frac{m(n+1)+2}{3}$ for i = 1
	$g(v_jv_{j+1})$for$1\leq j\leq \frac{m(n+1)-1}{3}$	$(12\text{nm}-5)\frac{1}{10^r}$ for i = 3	$\frac{m(n+1)-1}{3}$ for i = 3
	$g(v_jv_{j+1})$ for$\frac{m(n+1)-1}{3}+1\leq j\leq \frac{2}{3}(m(n+1)-1)$	$(12\text{nm}-4)\frac{1}{10^r}$ for i = 2	$\frac{m(n+1)-1}{3}$ for i = 2
$m(n+1)=3S+2$, $S\geq 1$	$g(v\,v_{1+n(j-1)})$for$1\leq j\leq m$ $g(v_jv_{j+1})$ for$\frac{2}{3}(m(n+1)+1)+1\leq j\leq nm-1$ $g(v_1v_{nm})$	$(12\text{nm}-3)\frac{1}{10^r}$ for i = 1	$\frac{m(n+1)-2}{3}$ for i = 1
	$g(v_jv_{j+1})$for$1\leq j\leq \frac{m(n+1)+1}{3}$	$(12\text{nm}-5)\frac{1}{10^r}$ for i = 3	$\frac{m(n+1)+1}{3}$ for i = 3
	$g(v_jv_{j+1})$ for$\frac{m(n+1)+1}{3}+1\leq j\leq \frac{2}{3}(m(n+1)+1)$	$(12\text{nm}-4)\frac{1}{10^r}$ for i = 2	$\frac{m(n+1)+1}{3}$ for i = 2

Case (ii) If n is odd

Subcase (i) If $m(n+1)=3S,\ S\geq 1$

$\mu(v\,v_{1+n(j-1)})=\frac{(j-1)2n+2}{10^r}$for $1\leq j\leq m$

$\mu(v_jv_{j+1})=\frac{3+(j-1)4}{10^r}$for $1\leq j\leq \frac{m(n+1)}{3}$

Subcase (i)a If $n=3$

$\mu(v_jv_{j+1})=\frac{4+(j-1)4}{10^r}for\frac{m(n+1)}{3}+1\leq j\leq nm-1$

$\mu(v_1v_{nm})\ =\frac{2nm+1}{10^r}$

$\sigma(v_j) = \frac{6nm-2-2j}{10^r}$for $1 \leq j \leq nm$

$\sigma(v) = \frac{6nm-3}{10^r}$

By the definition of MMV:

$K_1 = \frac{12nm-5}{10^r}$, $K_2 = \frac{12nm-6}{10^r}$ and $K_3 = \frac{12nm-7}{10^r}$

$|K_1| = |K_2| = |K_3| = \frac{m(n+1)}{3}$

Subcase (i)b If $n > 3$

$\mu(v_j v_{j+1}) = \frac{4+(j-1)4}{10^r}$for $\frac{m(n+1)}{3} + 1 \leq j \leq \frac{2}{3}\ (m(n+1))$

$\mu(v_j v_{j+1}) = \frac{5+(j-1)4}{10^r}$for $\frac{2}{3}(m(n+1)) + 1 \leq j \leq nm - 1$

$\mu(v_1 v_{nm}) = \frac{2nm+1}{10^r}$

$\sigma(v_j) = \frac{6nm-1-2j}{10^r}$for $1 \leq j \leq nm$

$\sigma(v) = \frac{6nm-2}{10^r}$

By the definition of MMV:

$K_1 = \frac{12nm-3}{10^r}$, $K_2 = \frac{12nm-4}{10^r}$ and $K_3 = \frac{12nm-5}{10^r}$

$|K_1| = |K_2| = |K_3| = \frac{m(n+1)}{3}$

Subcase (i)c If$m = 4,\ n = 5 + 6j,\ j > 1$.

$\mu(v\ v_{1+n(j-1)}) = \frac{(j-1)2n+2}{10^r}$for $1 \leq j \leq m - 1$

$\mu(v\ v_{1+n(m-1)}) = \frac{(m-1)2n+3}{10^r}$

$\mu(v_j v_{j+1}) = \frac{3+(j-1)4}{10^r}$for $1 \leq j \leq \frac{m(n+1)}{3}$

$\mu(v_j v_{j+1}) = \frac{4+(j-1)4}{10^r}$for $\frac{m(n+1)}{3} + 1 \leq j \leq \frac{2}{3}\ (m(n+1))$

$\mu(v_j v_{j+1}) = \frac{5+(j-1)4}{10^r}$for $\frac{2}{3}(m(n+1)) + 1 \leq j \leq \frac{2}{3}(m(n+1)) + 2$

$\mu(v_{n(m-1)} v_{1+n(m-1)}) = \frac{4n(m-1)+2}{10^r}$

$\mu(v_{1+n(m-1)} v_{2+n(m-1)}) = \frac{4n(m-1)+6}{10^r}$

$\mu(v_j v_{j+1}) = \frac{5+(j-1)4}{10^r}$for $2 + n(m-1) \leq j \leq nm - 1$

$\mu(v_1 v_{nm}) = \frac{2nm+1}{10^r}$

$\sigma(v_j) = \frac{6nm-1-2j}{10^r}$for $1 \leq j \leq n(m-1)$

$\sigma(v_{1+n(m-1)}) = \frac{2n(2m+1)-4}{10^r}$

$\sigma(v_j) = \frac{6nm-1-2j}{10^r}$for $2 + n(m-1) \leq j \leq nm$

$\sigma(v) = \frac{6nm-2}{10^r}$

By the definition of MMV:

$K_1 = \frac{12nm-3}{10^r}$, $K_2 = \frac{12nm-4}{10^r}$ and $K_3 = \frac{12nm-5}{10^r}$

$|K_1| = |K_2| = |K_3| = \frac{m(n+1)}{3}$

Subcase (ii) If $m(n+1) = 3S+1,\ S \geq 1$

$\mu(v\, v_{1+n(j-1)}) = \frac{(j-1)2n+2}{10^r}$ for $1 \leq j \leq m$

$\mu(v_j v_{j+1}) = \frac{3+(j-1)4}{10^r}$ for $1 \leq j \leq \frac{m(n+1)-1}{3}$

$\mu(v_j v_{j+1}) = \frac{4+(j-1)4}{10^r}$ for $\frac{m(n+1)-1}{3} + 1 \leq j \leq \frac{2}{3}\ (m(n+1)-1)$

$\mu(v_j v_{j+1}) = \frac{5+(j-1)4}{10^r}$ for $\frac{2}{3}(m(n+1)-1) + 1 \leq j \leq nm-1$

$\mu(v_1 v_{nm}) = \frac{2nm+1}{10^r}$

$\sigma(v_j) = \frac{6nm-1-2j}{10^r}$ for $1 \leq j \leq nm$

$\sigma(v) = \frac{6nm-2}{10^r}$

By the definition of MMV:

$K_1 = \frac{12nm-3}{10^r}$, $K_2 = \frac{12nm-4}{10^r}$ and $K_3 = \frac{12nm-5}{10^r}$

$|K_1| = \frac{m(n+1)+2}{3}$ and $|K_2| = |K_3| = \frac{m(n+1)-1}{3}$

Subcase (iii) If $m(n+1) = 3S+2,\ S \geq 1$

$\mu(v\, v_{1+n(j-1)}) = \frac{(j-1)2n+2}{10^r}$ for $1 \leq j \leq m$

$\mu(v_j v_{j+1}) = \frac{3+(j-1)4}{10^r}$ for $1 \leq j \leq \frac{m(n+1)+1}{3}$

$\mu(v_j v_{j+1}) = \frac{4+(j-1)4}{10^r}$ for $\frac{m(n+1)+1}{3} + 1 \leq j \leq \frac{2}{3}\ (m(n+1)+1)$

$\mu(v_j v_{j+1}) = \frac{5+(j-1)4}{10^r}$ for $\frac{2}{3}(m(n+1)+1) + 1 \leq j \leq nm-1$

$\mu(v_1 v_{nm}) = \frac{2nm+1}{10^r}$

$\sigma(v_j) = \frac{6nm-1-2j}{10^r}$ for $1 \leq j \leq nm$

$\sigma(v) = \frac{6nm-2}{10^r}$

By the definition of MMV:

$K_1 = \frac{12nm-3}{10^r}$, $K_2 = \frac{12nm-4}{10^r}$ and $K_3 = \frac{12nm-5}{10^r}$

$|K_1| = \frac{m(n+1)-2}{3}$ and $|K_2| = |K_3| = \frac{m(n+1)+1}{3}$

MMVs K_i's, their corresponding edges and number of K_i's ($1 \leq i \leq 3$) are given in Table 2.

Table 2. MMVs K_i's, their corresponding edges and the number of K_i's ($1 \leq i \leq 3$).

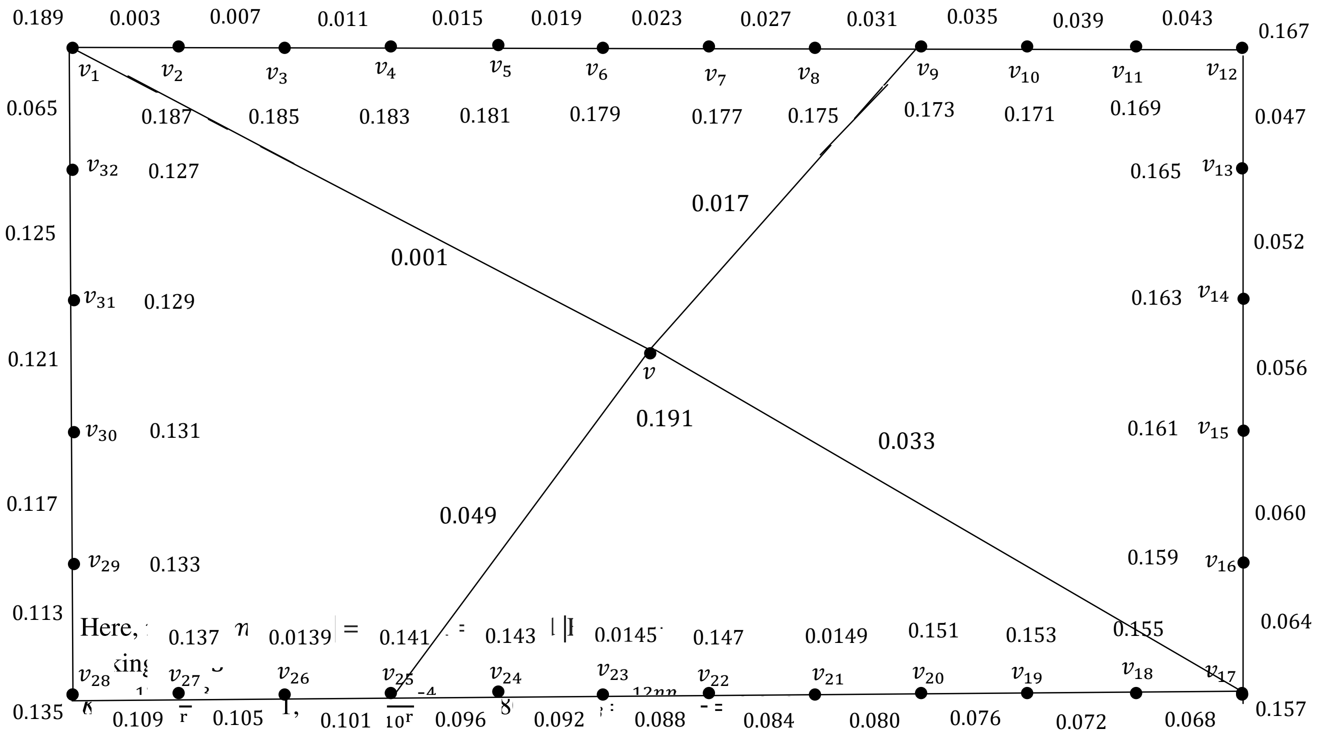
Nature of $m(n+1)$	Edges	MMV $K_i's$, 1≤ i ≤ 3	Number of $K_i's$, 1≤ i ≤3
$m(n+1) = 3S$, $S \geq 1$ and for n= 3	$g(v\, v_{1+n(j-1)})$ for $1 \leq j \leq m$ $g(v_1 v_{nm})$	$(12\text{nm}-5)\frac{1}{10^r}$ for i = 1	$\frac{m(n+1)}{3}$ for i = 1
	$g(v_j v_{j+1})$ for $1 \leq j \leq \frac{m(n+1)}{3}$	$(12\text{nm}-7)\frac{1}{10^r}$ for i = 3	$\frac{m(n+1)}{3}$ for i = 3

	$g(v_jv_{j+1})$ for $\frac{m(n+1)}{3}+1 \le j \le nm-1$	$(12\text{nm}-6)\frac{1}{10^r}$ for i = 2	$\frac{m(n+1)}{3}$ for i = 2
$\boldsymbol{m(n+1)=3S}$, $\boldsymbol{S \ge 1}$ **and for n> 3**	$g(v\,v_{1+n(j-1)})$for$1 \le j \le m$ $g(v_jv_{j+1})$ for$\frac{2}{3}(m(n+1))+1 \le j \le nm-1$	$(12\text{nm}-3)\frac{1}{10^r}$ for i = 1	$\frac{m(n+1)}{3}$ for i = 1
	$g(v_1v_{nm})$ $g(v_jv_{j+1})$for$1 \le j \le \frac{m(n+1)}{3}$	$(12\text{nm}-5)\frac{1}{10^r}$ for i = 3	$\frac{m(n+1)}{3}$ for i = 3
	$g(v_jv_{j+1})$ for$\frac{m(n+1)}{3}+1 \le j \le \frac{2}{3}\,(m(n+1))$	$(12\text{nm}-4)\frac{1}{10^r}$ for i = 2	$\frac{m(n+1)}{3}$ for i = 2
$\boldsymbol{m(n+1)=3S}$, $\boldsymbol{S \ge 1}$ **and for m = 4,** **n = 5+6j, j > 1**	$g(v\,v_{1+n(j-1)})$ for $1 \le j \le m-1$ $g(v\,v_{1+n(m-1)})$ $g(v_jv_{j+1})$ for $\frac{2}{3}(m(n+1))+1 \le j \le \frac{2}{3}(m(n+1))+2$ $g(v_1v_{nm})$ $g(v_{n(m-1)}v_{1+n(m-1)})$ $g(v_{1+n(m-1)}v_{2+n(m-1)})$ $g(v_jv_{j+1})$ for $2+n(m-1) \le j \le nm-1$	$(12\text{nm}-3)\frac{1}{10^r}$ for i = 1	$\frac{m(n+1)}{3}$ for i = 1
	$g(v_jv_{j+1})$ for $1 \le j \le \frac{m(n+1)}{3}$	$(12\text{nm}-5)\frac{1}{10^r}$ for i = 3	$\frac{m(n+1)}{3}$ for i = 3
	$g(v_jv_{j+1})$ for $\frac{m(n+1)}{3}+1 \le j \le \frac{2}{3}\,(m(n+1))$	$(12\text{nm}-4)\frac{1}{10^r}$ for i = 2	$\frac{m(n+1)}{3}$ for i = 2
$\boldsymbol{m(n+1)=3S+1}$, $\boldsymbol{S \ge 1}$	$g(v\,v_{1+n(j-1)})$for$1 \le j \le m$ $g(v_jv_{j+1})$ for$\frac{2}{3}(m(n+1)-1)+1 \le j \le nm-1$ $g(v_1v_{nm})$	$(12\text{nm}-3)\frac{1}{10^r}$ for i = 1	$\frac{m(n+1)+2}{3}$ for i = 1
	$g(v_jv_{j+1})$for$1 \le j \le \frac{m(n+1)-1}{3}$	$(12\text{nm}-5)\frac{1}{10^r}$ for i = 3	$\frac{m(n+1)-1}{3}$ for i = 3
	$g(v_jv_{j+1})$ for$\frac{m(n+1)-1}{3}+1 \le j \le \frac{2}{3}\,(m(n+1)-1)$	$(12\text{nm}-4)\frac{1}{10^r}$ for i = 2	$\frac{m(n+1)-1}{3}$ for i = 2

$\boldsymbol{m(n+1) = 3S+2,}$ $\boldsymbol{S \geq 1}$	$g(v\, v_{1+n(j-1)})$ for $1 \leq j \leq m$ $g(v_j v_{j+1})$ for $\frac{2}{3}(m(n+1)+1)+1 \leq j \leq nm-1$ $g(v_1 v_{nm})$	$(12\text{nm}-3)\frac{1}{10^r}$ for i = 1	$\frac{m(n+1)-2}{3}$ for i = 1
	$g(v_j v_{j+1})$ for $1 \leq j \leq \frac{m(n+1)+1}{3}$	$(12\text{nm}-5)\frac{1}{10^r}$ for i = 3	$\frac{m(n+1)+1}{3}$ for i = 3
	$g(v_j v_{j+1})$ for $\frac{m(n+1)+1}{3}+1 \leq j \leq \frac{2}{3}(m(n+1)+1)$	$(12\text{nm}-4)\frac{1}{10^r}$ for i = 2	$\frac{m(n+1)+1}{3}$ for i = 2

Hence the maximum difference between the number of K_i's and K_j's is 1 and $|K_i - K_j| \leq \frac{2}{10^r}$ for 1 ≤ i, j ≤ 3. Hence theGeneralized Jahangir graph $\boldsymbol{JG_{n,m}}$ admits fuzzy tri-magic labeling for $n \geq 2, m \geq 3$.

Example 2.1.1: The Generalized Jahangir graph $JG_{8,4}$admits fuzzy edge tri-magic labeling.



$|K_1| = |K_2| = |K_3| = \frac{[illegible]}{3} = 12$

4. Conclusion

In this paper, we have shown that the Generalized Jahangir graph $JG_{n,m}$for $n \geq 2, m \geq 3$admits fuzzy edge tri-magic labeling. We are working in fuzzy tri-magic labeling of some other graphs.

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