Research Article

Intuitionistic Fuzzy Ideals of MΓgroups in Near Rings as Maximal Product of Graphs

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Abstract: This paper explains about the degree of the vertices in the Maximal product of graphs which represents the IF Ideals of MΓgroup**s** in Near rings. It also describes various theorems about the characteristics of the vertices in calculating the degrees with an example

Keywords: IF Ideals of MΓgroup**s** in Near rings, Maximal product of graphs, Degrees of vertices in Maximal product of graphs

1. Introduction

In 1983. G. Pilz [11] introduced and explained the concept of Near rings. After the introduction of Fuzzy set by Zadeh L.A[15], many extended the algebraic concept of Near rings to Fuzzy Near rings. In 1996, S. D. KIM &H. S. KIM [4] extended Fuzzy Ideals of Near rings and also explained their various characteristics by theorems.K. T. Atanassov [1], in 1986 extended Fuzzy sets to IF sets by introducing IF sets .Later A.Jianming et al[2] discussed about IF ideals in near rings in 2005,M.G.Karunambigai et al[6] in 2012, explained various properties of IF graphs with its properties.S.K.Mala et al [7]described IF ideals of MΓgroups in Near rings in 2018 and later represented them as graph byS.K.Mala et al[8] by explaining its properties in 2019.In 2019, M. Sitara et al [10] introduced Fuzzy graph structures with applications in detail .The maximal product of graphs of IF Ideals of MΓgroups in Near rings has been discussed by S.K.Mala et al[9] in 2020 .

2. Preliminaries

Definition: 2.1

Near ring is a non-empty set with two binary operation satisfying

i. Group with respective to first operation
ii. Semi group with respect to second operation
iii. Second operation is distributive over the first operation.

Definition: 2.2

Fuzzy set is a crisp set with its elements having membership function. If they have non-membership value along with it satisfying the condition that their sum lies between 0 and 1,is called as anIntuitionistic Fuzzy set.

Definition: 2.3

A Fuzzy set in a near-ring R is called a fuzzy ideal of R if it satisfies:

(i) $\mu(x - y) \geq \min\{\mu(x), \mu(y)\}$
(ii) $\mu(y + x - y) \geq \mu(x)$
iii) $\mu(xy) \geq \mu(y)$
iv. $\mu((x + z)y - xy) \geq \mu(z)$ for all x, y, z ∈ R.

Definition: 2.4

An IF set *A* of a Near ringis said to beIntuitionistic fuzzy ringif it obeys

(i) $\mu_A(x - y) > \text{Min}\{\mu_A(x), \mu_A(y)\}$
(ii) $\mu_A(xy) > \text{Min}\{\mu_A(x), \mu_A(y)\}$
(iii) $\gamma_A(x - y) < \text{Max}\{\gamma_A(x), \gamma_A(y)\}$
(iv) $\gamma_A(xy) < \text{Max}\{\gamma_A(x), \gamma_A(y)\}$, for all *x*, *y in near ring.*

Definition: 2.5

Let $GI_1(V_{I1}, E_{I1}, \mu_{I1}, \gamma_{I1})$ and $GI_2(V_{I2}, E_{I2}, \mu_{I2}, \gamma_{I2})$ be 2 graphs of intuitionistic fuzzy ideals of MΓgroup in near rings (IFIMΓGNR) I_1 and I_2 then $GI_1 * GI_2 = (V_I, E_I, \mu_I, \gamma_I)$ is called maximal product graph of intuitionistic fuzzy ideal of MΓgroup in near rings with structure vertices –

$V_I = V_{I1} * V_{I2}$ and, edges -$E_I = \{((u_1,v_1)(u_2,v_2)) / u_1=u_2$ and $v_1,v_2 \in$ EI2 (or) $v_1=v_2$ and $u_1, u_2 \in E_{I1}\}$

Here $\mu_I(u,v) = \mu_{I1}(u) \vee \mu_{I2}(v)$ for all $(u,v) \in V_I$
and $\gamma_I(u,v) = \gamma_{I1}(u) \wedge \gamma_{I2}(v)$ for all $(u,v) \in V_I$.
Also, $\mu_I((u_1,v_1)(u_2,v_2)) = \{\mu_{I1}(u_1) \vee \mu_{I2}(v_1 v_2)$ where $u_1 = u_2$ & $v_1 v_2 \in E_{I2}$
$\mu_{I2}(v_2) \vee \mu_{I1}(u_1 u_2)$ where $v_1=v_2$ & $u_1 u_2 \in E_{I1}$
and $\gamma_I((u_1,v_1)(u_2,v_2)) = \{\gamma_{I1}(u_1) \wedge \gamma_{I2}(v_1 v_2)$ where $u_1 = u_2$ & $v_1 v_2 \in E_{I2}$
$\gamma_{I2}(v_2) \wedge \gamma_{I1}(u_1 u_2)$ where $v_1=v_2$ & $u_1 u_2 \in E_{I1}$.

Here E_I(edges set) has edges only if either the first coordinates are same, or the second coordinates are same with an edge existing already in GI_1 or GI_2.

3. Intuitionistic Fuzzy Ideals of MΓgroups in Near Rings as Maximal Products of Graph

Let $GI_1(V_{I_1},E_{I_1},\mu_{I_1},\gamma_{I_1})$ and $GI_2(V_{I_2}, E_{I_2}, \mu_{I_2}, \gamma_{I_2})$ be two graphs of IFIMΓGNR I_1 and I_2 in near ring N*then, $GI_1*GI_2 = (V_I, E_I, \mu_I, \gamma_I)$ is called maximal product structure of IFIMΓGNR.

The following theorems explains the degree and total degree of vertices V_I of $GI_1 * GI_2$.

Theorem: 3.1

If $GI_1(V_{I_1},E_{I_1},\mu_{I_1},\gamma_{I_1})$ and $GI_2(V_{I_2}, E_{I_2}, \mu_{I_2}, \gamma_{I_2})$ are the graphs of IFIMΓGNR such that $\mu_{I_1}(u_i) \leq \mu_{I_2}(u_iv_j)$ $\gamma_{I_1}(u_i) \geq \gamma_{I_2}(v_iv_j)$ therefore, the vertex degree of maximal product

$GI_1* GI_2(V_I, E_I, \mu_I, \gamma_I)$ is given by

$D_{GI_1*GI_2}\mu_I(u_i, v_j) = D_{GI_1}*\mu_{I_1}(u_i)\, \mu_{I_2}(v_j) + D_{GI_2}\, \mu_{I_2}(v_j)$

$D_{GI_1*GI_2}\gamma_I(u_i, v_j) = D_{GI_1}*\gamma_{I_1}(u_i)\, \gamma_{I_2}(v_j) + D_{GI_2}\gamma_{I_2}(v_j)$

Proof

Let $G_1(V_{I_1},E_{I_1},\mu_{I_1},\gamma_{I_1})$ and $G_2(V_{I_2}, E_{I_2}, \mu_{I_2}, \gamma_{I_2})$ are the graphs of IFIMΓGNR such that

$\mu_{I_1}(u_i) \leq \mu_{I_2}(v_iv_j)$ then $\mu_{I_1}(u_iv_j) \leq \mu_{I_2}(v_j)$ and $\gamma_{I_1}(u_i) \geq \gamma_{I_2}(v_iv_j)$ then $\gamma_{I_1}(u_iu_j) \geq \gamma_{I_2}(v_j)$ for $u_i \in V_{I_1}$, $u_iu_j \in E_{I_1}$, $v_i \in V_{I_2}$, $v_iv_j \in E_{I_2}$.

Therefore, the vertex degree of GI_1*GI_2 maximal product are:

$D_{GI_1*GI_2}\mu_I(u_i, v_j) = \sum \mu_{I_1}(u_iu_j) \vee \mu_{I_2}(v_j) + \sum \mu_{I_2}(v_iv_j) \vee \mu_{I_1}(u_i)$ and

$D_{GI_1*GI_2}\gamma_I(u_i, v_j) = \sum \gamma_{I_1}(u_iu_j) \wedge \gamma_{I_2}(v_j) + \sum \gamma_{I_2}(v_iv_j) \wedge \gamma_{I_1}(u_i)$

$\Rightarrow D_{GI_1*GI_2}\mu_I(u_i, v_j) = \sum \mu_{I_2}(v_j) + \sum \mu_{I_2}(v_iv_j)$ and

$D_{GI_1*GI_2}\gamma_I(u_i, v_j) = \sum \gamma_{I_2}(v_j) + \sum \gamma_{I_2}(v_iv_j)$

$\Rightarrow D_{GI_1*GI_2}\mu_I(u_i, v_j) = D_{GI_1}*\mu_{I_1}(u_i)\mu_{I_2}(v_j) + D_{GI_2}\mu_{I_2}(v_j)$ and

$D_{GI_1*GI_2}\gamma_I(u_i, v_j) = D_{GI_1}*\gamma_{I_1}(u_i)\gamma_{I_2}(v_j) + D_{GI_2}\gamma_{I_2}(v_j)$

Example: 3.2

Consider $GI_1(V_{I_1},E_{I_1},\mu_{I_1},\gamma_{I_1})$ for $I_1 = \{0\}$ of Z_3 and $GI_2(V_{I_2}, E_{I_2}, \mu_{I_2}, \gamma_{I_2})$ for $I_2 = \{0\}$ of Z_4 therefore, $GI = GI_1 * GI_2$ is a maximal product of GI_1 and GI_2. This is explained in the following example.

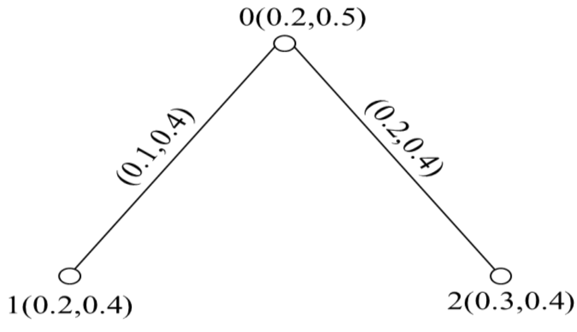

Figure 1: Graph GI1

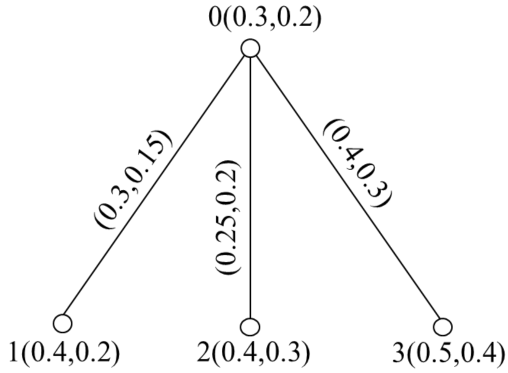

Figure 2: Graph GI2

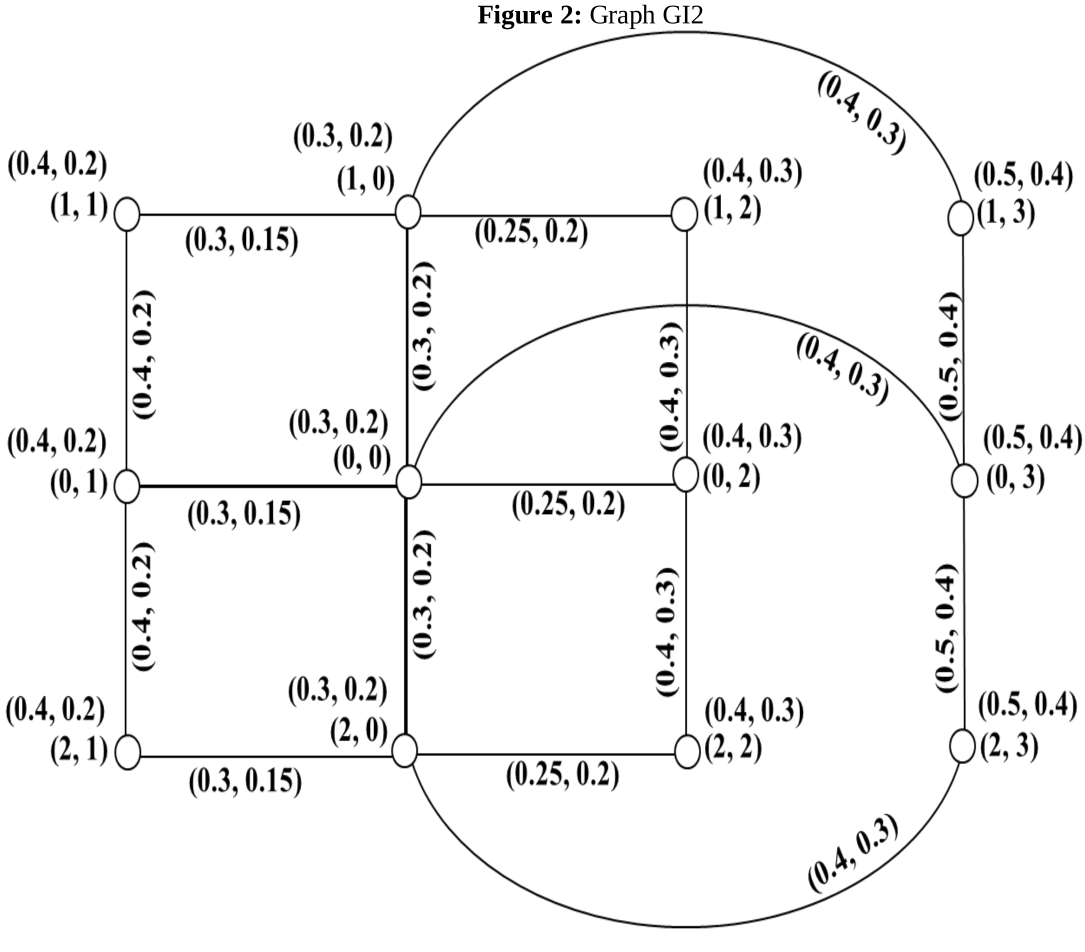

Figure 3: Graph GI1 * GI2

The μ_I value for $GI_1 * GI_2$ both by theorem and direct calculation are obtained as follows.

By theorem,

$D_{GI_1 * GI_2}\mu_I(0, 0) = D_{GI_1} * (0)\mu_{I_2}(0) + D_{GI_2}\mu_{I_2}(0)$

$= 2(0.3) + (0.3 + 0.25 + 0.4) = 1.55$

$D_{GI_1 * GI_2}\mu_I(0, 1) = D_{GI_1} * (0)\mu_{I_2}(1) + D_{GI_2}\mu_{I_2}(1)$

$= 2(0.4) + (0.3) = 1.1$

$D_{GI_1 * GI_2}\mu_I(0, 2) = D_{GI_1} * (0)\mu_{I_2}(2) + D_{GI_2}\mu_{I_2}(2)$

$= 2(0.4) + (0.25) = 1.05$

$D_{GI_1 * GI_2}\mu_I(0, 3) = D_{GI_1} * (0)\mu_{I_2}(3) + D_{GI_2}\mu_{I_2}(3)$

$= 2(0.5) + (0.4) = 1.4$

$D_{GI_1 * GI_2}\mu_I(1, 0) = D_{GI_1}*(1)\mu_{I_2}(0) + D_{GI_2}\mu_{I_2}(0)$
$= 1(0.3) + (0.3 + 0.25 + 0.4) = 1.25$
$D_{GI_1 * GI_2}\mu_I(1, 1) = D_{GI_1}*(1)\mu_{I_2}(1) + D_{GI_2}\mu_{I_2}(1)$
$= 1(0.4) + (0.3) = 0.7$
$D_{GI_1 * GI_2}\mu_I(1, 2) = D_{GI_1}*(1)\mu_{I_2}(2) + D_{GI_2}\mu_{I_2}(2)$
$= 1(0.4) + (0.25) = 1.65$
$D_{GI_1 * GI_2}\mu_I(1, 3) = D_{GI_1}*(1)\mu_{I_2}(3) + D_{GI_2}\mu_{I_2}(3)$
$= 1(0.5) + (0.4) = 0.9$
$D_{GI_1 * GI_2}\mu_I(2, 0) = D_{GI_1}*(2)\mu_{I_2}(0) + D_{GI_2}\mu_{I_2}(0)$
$= 1(0.3) + (0.3 + 0.25 + 0.4) = 1.25$
$D_{GI_1 * GI_2}\mu_I(2, 1) = D_{GI_1}*(2)\mu_{I_2}(1) + D_{GI_2}\mu_{I_2}(1)$
$= 1(0.4) + (0.3) = 0.7$
$D_{GI_1 * GI_2}\mu_I(2, 2) = D_{GI_1}*(2)\mu_{I_2}(2) + D_{GI_2}\mu_{I_2}(2)$
$= 1(0.4) + (0.25) = 1.65$
$D_{GI_1 * GI_2}\mu_I(2, 3) = D_{GI_1}*(2)\mu_{I_2}(3) + D_{GI_2}\mu_{I_2}(3)$
$= 1(0.5) + (0.4) = 0.9$
By direct calculation,
$D_{GI_1 * GI_2}\mu_I(0, 0) = 0.25 + 0.3 + 0.4 + 0.3 + 0.3 = 1.55$
$D_{GI_1 * GI_2}\mu_I(0, 1) = 0.3 + 0.4 + 0.4 = 0.1$
$D_{GI_1 * GI_2}\mu_I(0, 2) = 0.4 + 0.25 + 0.4 = 1.05$
$D_{GI_1 * GI_2}\mu_I(0, 3) = 0.5 + 0.5 + 0.4 = 1.4$
$D_{GI_1 * GI_2}\mu_I(1, 0) = 0.25 + 0.4 + 0.3 + 0.3 = 1.25$
$D_{GI_1 * GI_2}\mu_I(1, 1) = 0.3 + 0.4 = 0.7$
$D_{GI_1 * GI_2}\mu_I(1, 2) = 0.25 + 0.4 = 0.65$
$D_{GI_1 * GI_2}\mu_I(1, 3) = 0.4 + 0.5 = 0.9$
$D_{GI_1 * GI_2}\mu_I(2, 0) = 0.4 + 0.25 + 0.3 + 0.3 = 1.25$
$D_{GI_1 * GI_2}\mu_I(2, 1) = 0.4 + 0.3 = 0.7$
$D_{GI_1 * GI_2}\mu_I(2, 2) = 0.4 + 0.25 = 0.65$
$D_{GI_1 * GI_2}\mu_I(2, 3) = 0.5 + 0.4 = 0.9$
Similarly, the γ_I value for $GI_1 * GI_2$ both by theorem and direct calculation are obtained as follows:
By theorem,
$D_{GI_1 * GI_2}\gamma_I(0, 0) = D_{GI_1}*(0)\gamma_{I_2}(0) + D_{GI_2}\gamma_{I_2}(0)$
$= 2(0.2) + (0.15 + 0.2 + 0.3) = 1.05$
$D_{GI_1 * GI_2}\gamma_I(0, 1) = D_{GI_1}*(0)\gamma_{I_2}(1) + D_{GI_2}\gamma_{I_2}(1)$
$= 2(0.2) + (0.15) = 0.55$
$D_{GI_1 * GI_2}\gamma_I(0, 2) = D_{GI_1}*(0)\gamma_{I_2}(2) + D_{GI_2}\gamma_{I_2}(2)$
$= 2(0.3) + (0.2)$
$= 0.8$
$D_{GI_1 * GI_2}\gamma_I(0, 3) = D_{GI_1}*(0)\gamma_{I_2}(3) + D_{GI_2}\gamma_{I_2}(3)$
$= 2(0.4) + (0.3) = 1.1$
$D_{GI_1 * GI_2}\gamma_I(1, 0) = D_{GI_1}*(1)\gamma_{I_2}(0) + D_{GI_2}\gamma_{I_2}(0)$
$= 1(0.2) + (0.15 + 0.2 + 0.3) = 0.85$
$D_{GI_1 * GI_2}\gamma_I(1, 1) = D_{GI_1}*(1)\gamma_{I_2}(1) + D_{GI_2}\gamma_{I_2}(1)$
$= 1(0.2) + (0.15) = 0.35$
$D_{GI_1 * GI_2}\gamma_I(1, 2) = D_{GI_1}*(1)\gamma_{I_2}(2) + D_{GI_2}\gamma_{I_2}(2)$
$= 1(0.3) + (0.2) = 1.5$
$D_{GI_1 * GI_2}\gamma_I(1, 3) = D_{GI_1}*(1)\gamma_{I_2}(3) + D_{GI_2}\gamma_{I_2}(3)$
$= 1(0.4) + (0.3) = 0.7$
$D_{GI_1 * GI_2}\gamma_I(2, 0) = D_{GI_1}*(2)\gamma_{I_2}(0) + D_{GI_2}\gamma_{I_2}(0)$
$= 1(0.2) + (0.15 + 0.2 + 0.3) = 0.85$
$D_{GI_1 * GI_2}\gamma_I(2, 1) = d_{GI_1}*(2)\gamma_{I_2}(1) + d_{GI_2}\gamma_{I_2}(1)$
$= 1(0.2) + (0.15) = 0.35$
$D_{GI_1 * GI_2}\gamma_I(2, 2) = d_{GI_1}*(2)\gamma_{I_2}(2) + d_{GI_2}\gamma_{I_2}(2)$

= 1(0.3) + (0.2) = 0.5

$D_{GI_1 * GI_2}\gamma_I(2, 3) = d_{GI_1}*(2)\gamma_{I_2}(3) + d_{GI_2}\gamma_{I_2}(3)$

= 1(0.4) + (0.3) = 0.7

By direct calculation,

$D_{GI_1 * GI_2}\gamma_I(0, 0) = 0.2 + 0.3 + 0.2 + 0.2 + 0.15 = 1.05$

$D_{GI_1 * GI_2}\gamma_I(0, 1) = 0.2 + 0.2 + 0.15 = 0.55$

$D_{GI_1 * GI_2}\gamma_I(0, 2) = 0.3 + 0.3 + 0.2 = 0.8$

$D_{GI_1 * GI_2}\gamma_I(0, 3) = 0.3 + 0.4 + 0.4 = 1.1$

$D_{GI_1 * GI_2}\gamma_I(1, 0) = 0.2 + 0.2 + 0.3 + 0.15 = 1.85$

$D_{GI_1 * GI_2}\gamma_I(1, 1) = 0.15 + 0.2 = 0.35$

$D_{GI_1 * GI_2}\gamma_I(1, 2) = 0.2 + 0.3 = 0.5$

$D_{GI_1 * GI_2}\gamma_I(1, 3) = 0.4 + 0.3 = 0.7$

$D_{GI_1 * GI_2}\gamma_I(2, 0) = 0.15 + 0.2 + 0.2 + 0.3 = 0.85$

$D_{GI_1 * GI_2}\gamma_I(2, 1) = 0.2 + 0.15 = 0.35$

$D_{GI_1 * GI_2}\gamma_I(2, 2) = 0.3 + 0.2 = 0.5$

$D_{GI_1 * GI_2}\gamma_I(2, 3) = 0.3 + 0.4 = 0.7$

Theorem:3.3

If GI_1 $(V_{I_1}, E_{I_1}, \mu_{I_1}, \gamma_{I_1})$ and GI_2 $(V_{I_2}, E_{I_2}, \mu_{I_2}, \gamma_{I_2})$ are the graphs of IFIMΓGNR such that $\mu_{I_1}(u_i) \leq \mu_{I_2}(v_iv_j)$ $\gamma_{I_1}(u_i) \geq \gamma_{I_2}(v_iv_j)$ and function $\mu_{I_2}(v_j)$ is a constant "C_1" and function γ_{I_2} is a constant "C_2". Therefore, the vertex degree in $GI_1 * GI_2$ maximal product graph of IFIMΓGNR is given by $D_{GI_1 * GI_2}\mu_I(u_i, v_j) = D^*_{GI_1}\mu_{I_1}(u_i) . C_1 + D_{GI_2}\mu_{I_2}(v_j)$ and $D_{GI_1 * GI_2}\gamma_I(u_i, v_j) = D^*_{GI_1}\gamma_{I_1}(u_i). C_2 + D_{GI_2}\gamma_{I_2}(v_j)$

Proof

If GI_1 $(V_{I_1}, E_{I_1}, \mu_{I_1}, \gamma_{I_1})$ and GI_2 $(V_{I_2}, E_{I_2}, \mu_{I_2}, \gamma_{I_2})$ are the graphs of IFIMΓGNR in such a way that $\mu_{I_1}(u_i) \leq \mu_{I_2}(v_iv_j)$ and $\gamma_{I_1}(u_i) \geq \gamma_{I_2}(v_iv_j)$ for i, j =1 to n. Here $\mu_{I_2}(vj) = C_1$ and $\gamma_{I_2}(v_j) = C_2$. Also, $\mu_{I_1}(u_i) \leq \mu_{I_2}(v_iv_j) \Longrightarrow \mu_{I_1}(u_iu_j) \leq \mu_{I_2}(v_j)$ and $\gamma_{I_1}(u_i) \geq \gamma_{I_2}(v_iv_j) \Longrightarrow \gamma_{I_1}(u_iu_j) \geq \gamma_{I_2}(v_j)$ for i, j =1 to n.

Therefore, the vertex degree in $GI_1 * GI_2$ maximal product is

$$D_{GI_1 * GI_2}\mu_I(u_i, v_j) = \sum \mu_{I_1}(u_iu_j) \vee \mu_{I_2}(v_j) + \sum \mu_{I_2}(v_i, v_j) \vee \mu_{I_1}(u_i)$$
$$= \sum \mu_{I_2}(v_j) + \sum \mu_{I_2}(v_iv_j)$$
$$= D^*_{GI_1}\mu_{I_2}(u_i).C_1 + D_{GI_2}\mu_{I_2}(v_j)$$

Also, $D_{GI_1 * GI_2}\gamma_I(u_i, u_j) = \sum \gamma_{I_1}(u_iu_j) \wedge \gamma_{I_2}(v_j) + \sum \gamma_{I_2}(v_i, v_j) \wedge \gamma_{I_1}(u_i)$

$$= \sum \gamma_{I_2}(v_j) + \sum \gamma_{I_2}(v_iv_j) = D^*_{GI_1}\gamma_{I_2}(u_i).C_2 + D_{GI_2}\gamma_{I_2}(v_j)$$

Theorem :3.4

If GI_1 $(V_{I_1}, EI_1, \mu_{I_1}, \gamma_{I_1})$ and GI_2 $(V_{I_2}, E_{I_2}, \mu_{I_2}, \gamma_{I_2})$ are the graphs of IFIMΓGNR, I_1 and I_2 such that $\mu_{I_2}(v_j) \leq \mu_{I_1}(u_iv_j)$ and $\gamma_{I_2}(v_j) \geq \gamma_{I_1}(v_iv_j)$ Therefore, the vertex degree in $GI_1 * GI_2$ maximal product graph is given by

$$D_{GI_1 * GI_2}\mu(u_i, v_j) = D^*_{GI_2}\mu_{I_2}(v_j)\ \mu_{I_1}(u_i) + D_{GI_1}\mu_{I_1}(u_i)$$
$$D_{GI_1 * GI_2}\gamma(u_i, v_j) = D^*_{GI_2}\gamma_{I_2}(v_j)\ \gamma_{I_1}(u_i) + D_{GI_1}\gamma_{I_1}(u_i)$$

Proof

If GI_1 $(V_{I_1}, E_{I_1}, \mu_{I_1}, \gamma_{I_1})$ and GI_2 $(V_{I_2}, E_{I_2}, \mu_{I_2}, \gamma_{I_2})$ are the graphs of IFIMΓGNR, I_1 and I_2 so that $\mu_{I_2}(u_j) \leq \mu_{I_1}(u_iu_k) \Longrightarrow \mu_{I_2}(v_iv_j) \leq \mu_{I_1}(u_i)$ for i, j =1 to n and

$\gamma_{I_2}(u_j) \geq \gamma_{I_1}(u_iu_k) \Longrightarrow \gamma_{I_2}(v_iv_j) \geq \gamma_{I_1}(u_i)$.

Therefore, the vertex degree of maximal product $GI_1 * GI_2$ is

$$D_{GI_1 * GI_2}\mu_I(u_iv_j) = \sum \mu_{I_1}(u_iu_k) \vee \mu_{I_2}(v_j) + \sum \mu_{I_2}(v_iv_j) \vee \mu_{I_1}(u_i)$$
$$\Longrightarrow D_{GI_1 * GI_2}\mu_I(u_i, v_j) = \sum \mu_{I_1}(u_iu_k) + \sum \mu_{I_1}(u_i)$$
$$= D_{GI_1}\mu_{I_1}(u_i) + D^*_{GI_2}\mu_{I_2}(v_j)\ \mu_{I_1}(u_i)$$

Similarly, $D_{GI_1 * GI_2}\gamma_I(u_iv_j) = \sum \gamma_{I_1}(u_iu_k) \wedge \gamma_{I_2}(v_j) + \sum \gamma_{I_2}(v_iv_j) \wedge \gamma_{I_1}(u_i)$

$$\Longrightarrow D_{GI_1 * GI_2}\gamma_I(u_i, v_j) = \sum \gamma_{I_1}(u_iu_k) + \sum \gamma_{I_1}(u_i)$$
$$= D_{GI_1}\gamma_{I_1}(u_i) + D^*_{GI_2}\gamma_{I_2}(v_j)\ \gamma_{I_1}(u_i)$$

4. Conclusion

The degree of maximal product of two graphs of IF Ideals of MΓgroups in Near rings are explained by theorems and verified through an example .This can be further extended in Intuitionistic fuzzy graph which has wider applications in the modern scientific world.

5. References

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