MANIPAL UNIVERSITY
JAIPUR
(University under Section 2(f) of the UGC Act)

FIRST STATE PRIVATE UNIVERSITY IN RAJASTHAN
A+ NAAC
3.28 SCORE

B.TECH SECOND YEAR

ACADEMIC YEAR: 2022-2023

COURSE NAME: ENGINEERING MATHEMATICS-III

COURSE CODE : MA 2101

LECTURE SERIES NO :

CREDITS : 3

MODE OF DELIVERY : ONLINE (POWER POINT PRESENTATION)

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PROPOSED DATE OF DELIVERY:

MANIPAL UNIVERSITY
JAIPUR

VISION
Global Leadership in Higher Education and Human Development

MISSION
- Be the most preferred University for innovative and interdisciplinary learning
- Foster academic, research and professional excellence in all domains
- Transform young minds into competent professionals with good human values

VALUES
Integrity, Transparency, Quality,
Team Work, Execution with Passion, Humane Touch

SESSION OUTCOME

"EQUIVALENCE OF TWO GRAPHS "

ASSESSMENT CRITERIA'S

ASSIGNMENT

QUIZ

MID TERM EXAMINATION –I & II

END TERM EXAMINATION

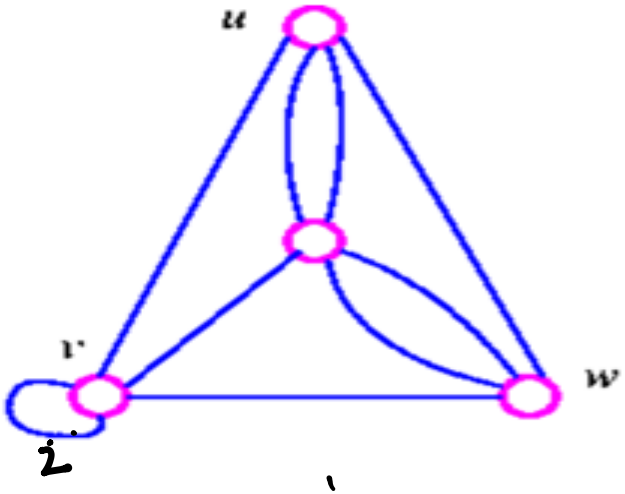
PROGRAM OUTCOMES MAPPING WITH CO2

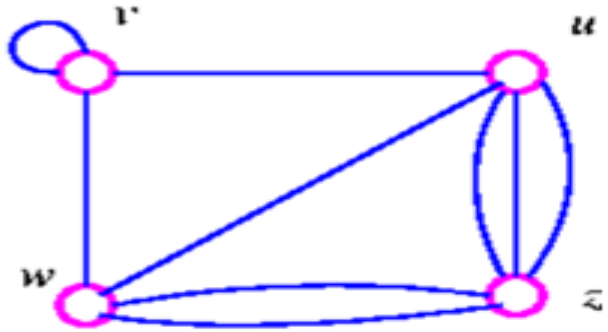
PO 1

ENGINEERING KNOWLEDGE: APPLY THE KNOWLEDGE OF MATHEMATICS, SCIENCE, ENGINEERING FUNDAMENTALS, AND AN ENGINEERING SPECIALIZATION TO THE SOLUTION OF COMPLEX ENGINEERING PROBLEMS.

Isomorphic Graphs

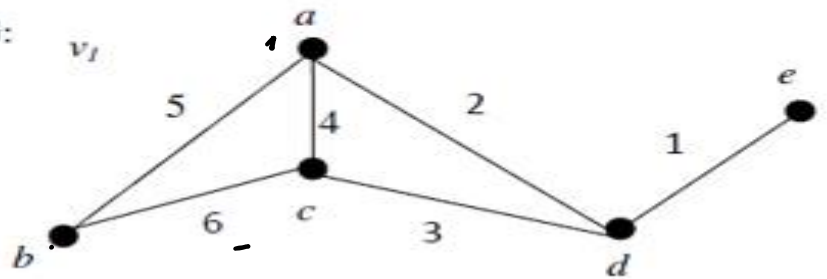
- Two graph G and H are isomorphic if H can be obtained from G by relabeling the vertices - that is, if there is a one-to-one correspondence between the vertices of G and those of H, such that the number of edges joining any pair of vertices in G is equal to the number of edges joining the corresponding pair of vertices in H. For example, two labeled graphs, such as



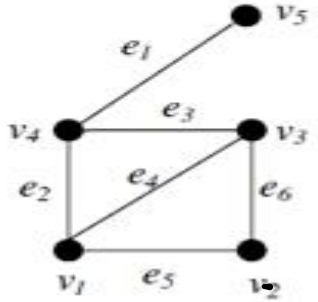


Example:

Graph G:



Graph G':



Correspondence of vertices

$f(a) = v_1$

$f(b) = v_2$

$f(c) = v_3$

$f(d) = v_4$

$f(e) = v_5$

Correspondence of edges

$f(1) = e_1$

$f(2) = e_2$

$f(3) = e_3$

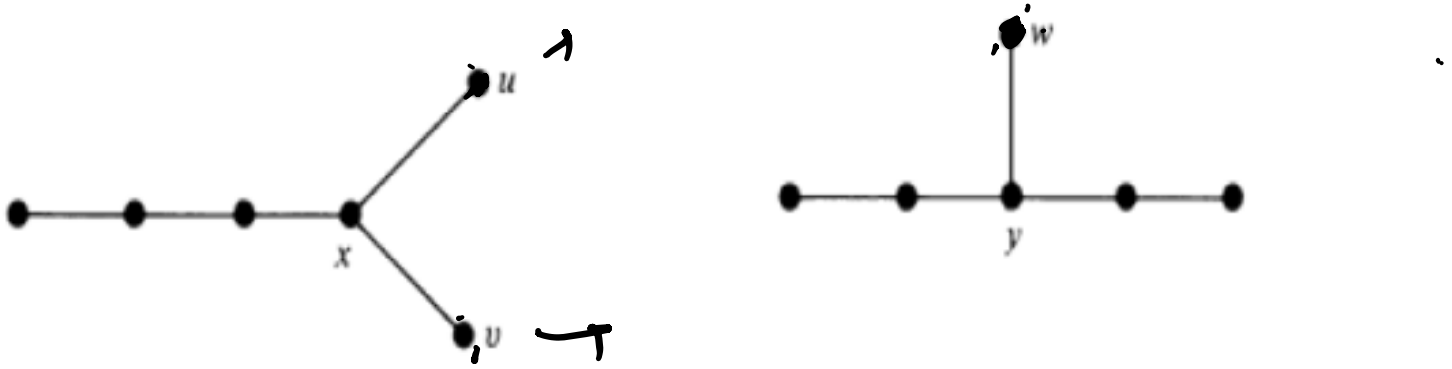
$f(4) = e_4$

$f(5) = e_5$

Adjacency also preserved. Therefore G and G' are said to be isomorphic.

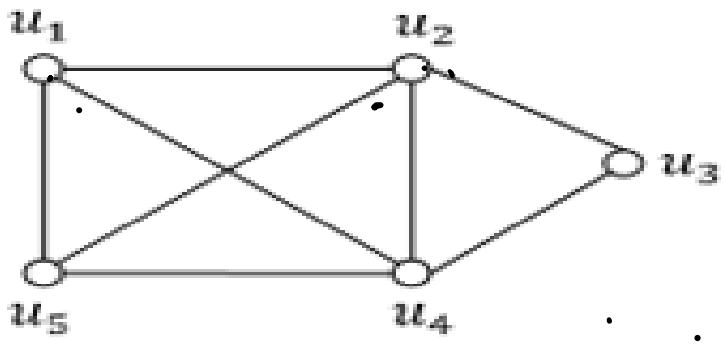
Example:

The following two graphs are not isomorphic, because x is adjacent to two pendent vertex is not preserved.

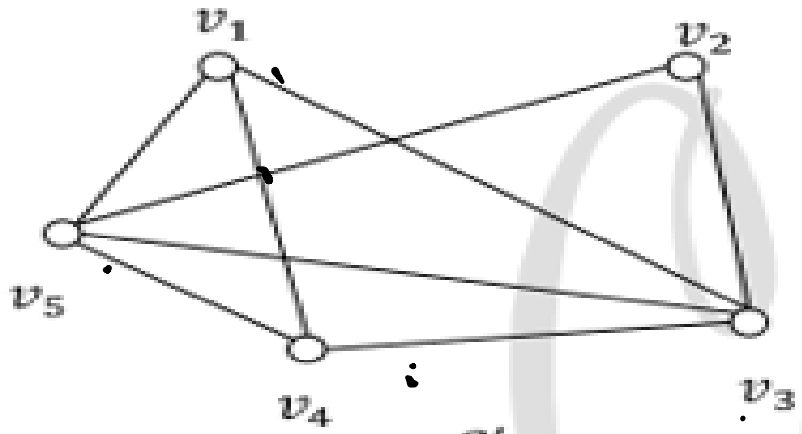


Example:

Examine whether the following pair of graphs are isomorphic. If not isomorphic, give the reasons.



G



G'

Solution:

In G, the number of vertices is 5, the number of edges is 8.

$$\deg(u_1) = 3\,, \deg(u_2) = 4\,, \deg(u_3) = 2\,, \deg(u_4) = 4\,, \deg(u_5) = 3$$

In G', the number of vertices is 5, the number of edges is 8.

$$\deg(v_1) = 3\,, \deg(v_2) = 2\,, \deg(v_3) = 4\,, \deg(v_4) = 3\,, \deg(v_5) = 4$$

There are same number of vertices and edges in both the graph G and G'.

Here in both graphs G and G', two vertices are of degree 3, two vertices are of degree 4, and one vertex is of degree 2.

$$u_1 \to v_1, u_2 \to v_5, u_3 \to v_2, u_4 \to v_3, u_5 \to v_4$$

There is one to one correspondences between the graphs G and G'.

$\therefore$ The graphs $G$and G' are isomorphic.