Final term Paper

Discrete maths

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Q1

Ans= BioPartite Graphs=

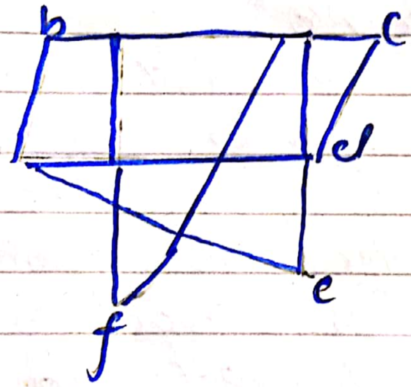
Sometimes a graph has the Property that its vertex set can be divided into two disjoint Subsets Such that each edge Connects a vertex in one of these Subsets to a vertex in the other Subset For example,
Consider the graph representing marriages between men and women in a village, where each person is represented by a vertex and a marriges is represented by an edge.
In this graph, each edge Connects a vertex in the Subset of vertices representing males and a vertex in the Subset of vertices represting females. This leads us to

A Simple graph G is Called bipartite if its vertex Set V can be partitioned into two disjoint Sets V1 and V2 Such that every edge in the graph Connects a vertex in V1 and a vertex in V2.
So that no edge Connects a vertex in the Subset vertices in V1 or two vertices in V2) when this Condition holds, we Call the pair (V1, V2) bipartition..

Graphs BiPartite:

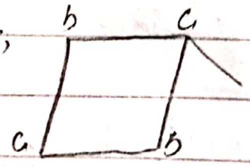
Part a,

i, graph is not a bipartite graph because its vertex set cannot be partitioned into two mutually disjoint non empty subsets A and B such that the vertices in A may be connected to vertices in B, but no vertices in A are connected to vertices in A and no vertices in B are connected to vertices in B.



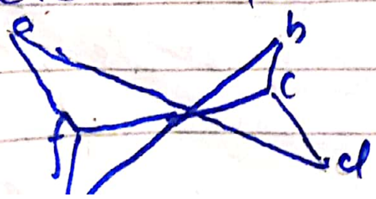
The graph is not bipartite.

iii,



ii. Part b;

graph is not a bipartite graph because it vertex set cannot be partitioned into two mutually disjoint non empty subsets A and B such that the vertices in A may be connected to vertices in A and no vertices in B are connected to vertices



Question: 2

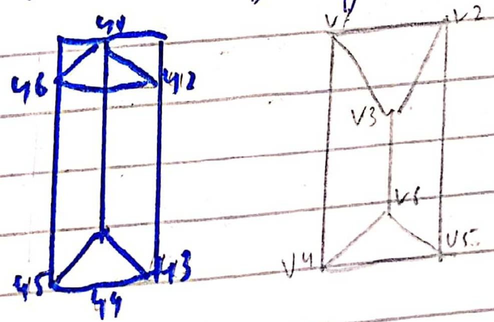
Determine whether the given Pair of graph is to isomorphic.

Ans

let G be a directed graph with ordered vertices V1 --- vn The according adjency matrix of G is the nxn matrix A= over the set of nonneget integer such that aij - the ~~nth~~ number of arrows from to v3 for all i, j = 1, 2

Note that nonzero entries along the main diagonal of an adjency matrix indicate the presence of loops, and entires larger then 1 corresponding to parallel edges moreover if the vertices of a directed graph are reordered then the entrices is the rows and colums of the corresponding adjencey metrix are moved around

Example - The two directed graphs show below differ only in the ordering of their adjency metrix.

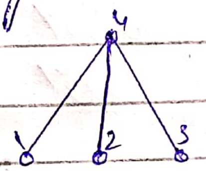


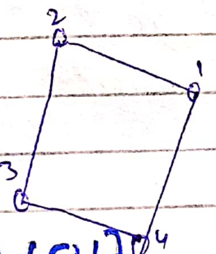
Question 3

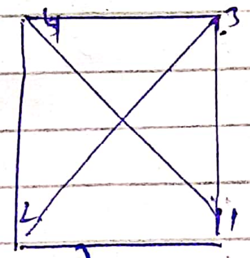
Ans=

adjacency matrices to isomorphic

The adjacency matrices, sometimes also called the connection matrix of a simple labeled graph is a matrix with rows and colums labeled by graph vertices, with a 1 or 0 in position according to whether and are adjecency or not. For a simple graph with no self-loops, the adjacency matrix must have 0s on the diagonal. For an undirected graph, the adjcency matrix is symmetic.

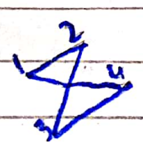


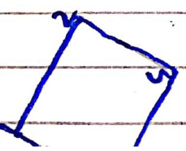


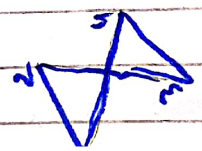


$$\begin{bmatrix} 0&0&0&1 \\ 0&0&0&1 \\ 0&0&0&1 \\ 1&1&1&0 \end{bmatrix} \quad \begin{bmatrix} 0&1&0&1 \\ 1&0&1&0 \\ 0&1&0&1 \\ 1&0&1&0 \end{bmatrix} \quad \begin{bmatrix} 0&1&1&1 \\ 1&0&1&1 \\ 1&1&0&1 \\ 1&1&1&0 \end{bmatrix}$$

The illustration above shows adjacency matrices for particular labelings of the claw graph, cycle graph, and complete graph.



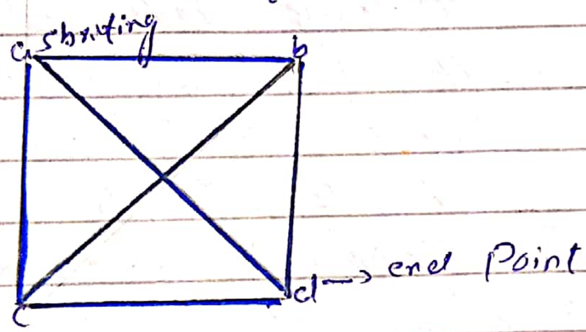




Question=4

Ans:-

Determine whether the given has an Euler Circuit. Constant Such a Circuit when one exists. determine whether the graph has an Euler Path and construct Such a Path if one exists



Euler Path a, b, c, c. b. d. c.a.e.d
this not Euler Path Circuit because Starting point and ending point is not once.

Q5

Ra → b Blue
→ d Blue
e Blue

B — a Red
C Red
f Red

b → a Red
→ f Red
C Red

C → d Red
e Red
f Red

d → a Red
C Red

d — C Red
a Red

e — a Red
C Red

e → C Red
a Red

f — b Bl
C Red

f → b Red
C Red

a → C Red
f Red

b — f Red
C Red

C — d Red
e Red

e — f
C