

7. A vertex v is said to be cut-vertex of a graph G if
- the graph G is connected.
 - the graph $G - v$ is connected.
 - the graph G is disconnected.
 - the graph $G - v$ is disconnected.
8. A complete graph K_n is a regular graph of degree
- n
 - $n - 1$
 - $n - 2$
 - $n - 3$
9. A map is a ...
- connected planar graph containing no bridges.
 - connected planar graph containing one bridges.
 - connected planar graph containing two bridges.
 - connected planar graph containing three bridges.
10. Every planar graph G has
- $\chi(G) \leq 2$
 - $\chi(G) \leq 3$
 - $\chi(G) \leq 4$
 - $\chi(G) \geq 4$

Mid-West University
Examinations Management Office
 Surkhet, Nepal

End Semester Examination-2080

Level: B.Ed. / III Semester

Time: 3.00 hrs.

FM: 60

PM: 30

Sub: Graph Theory (MATH 435/336)

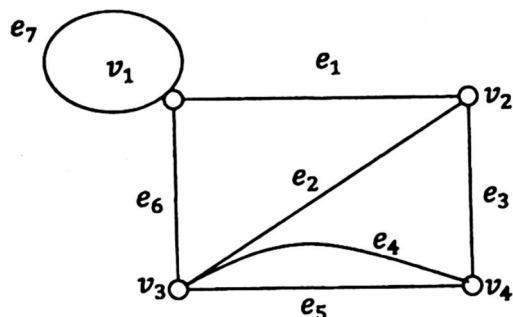
Candidates are required to give their answers in their own words as far as practicable.

Attempt All the Questions:

Group "B"

6×5 = 30

1. Define degree or valency of a vertex v in G . Consider the multigraph $G(V, E)$ in the graph below. Find the degree and parity (even or odd) of each vertex of G .



2. Prove that the number of odd vertices in a graph is always even.
3. Find the incidence matrix and adjacency matrix of the following

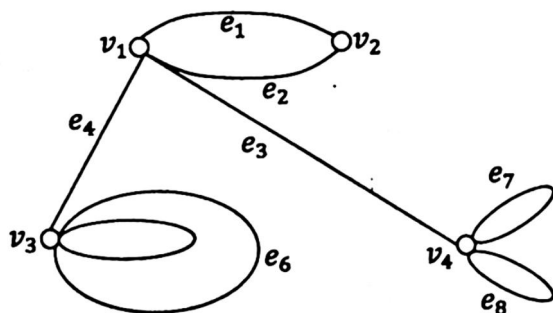
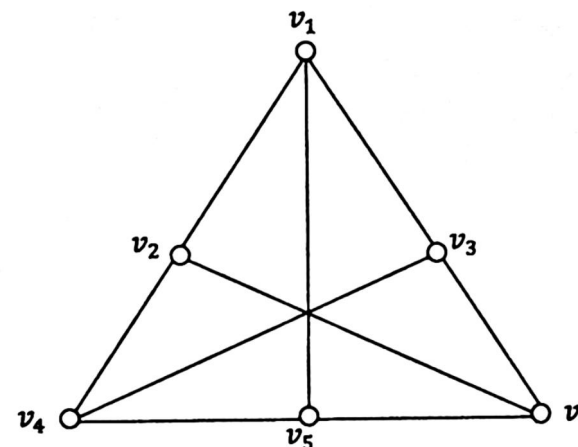


figure:

Or

Define chromatic number. Find the chromatic number of G in the figure below:



4. Prove that a connected graph (multigraph) G is eulerian if and only if each vertex has even degree.
5. Prove that every tournament T has a directed Hamiltonian path.
6. Define a weakly and strongly connected digraph. Prove that a digraph D is strongly connected if and only if it has a closed directed spanning path.

Or

Define out-degree and in-degree of vertex. Find the in-degree and the out-degree of each vertex v_i in the digraph D given below:

