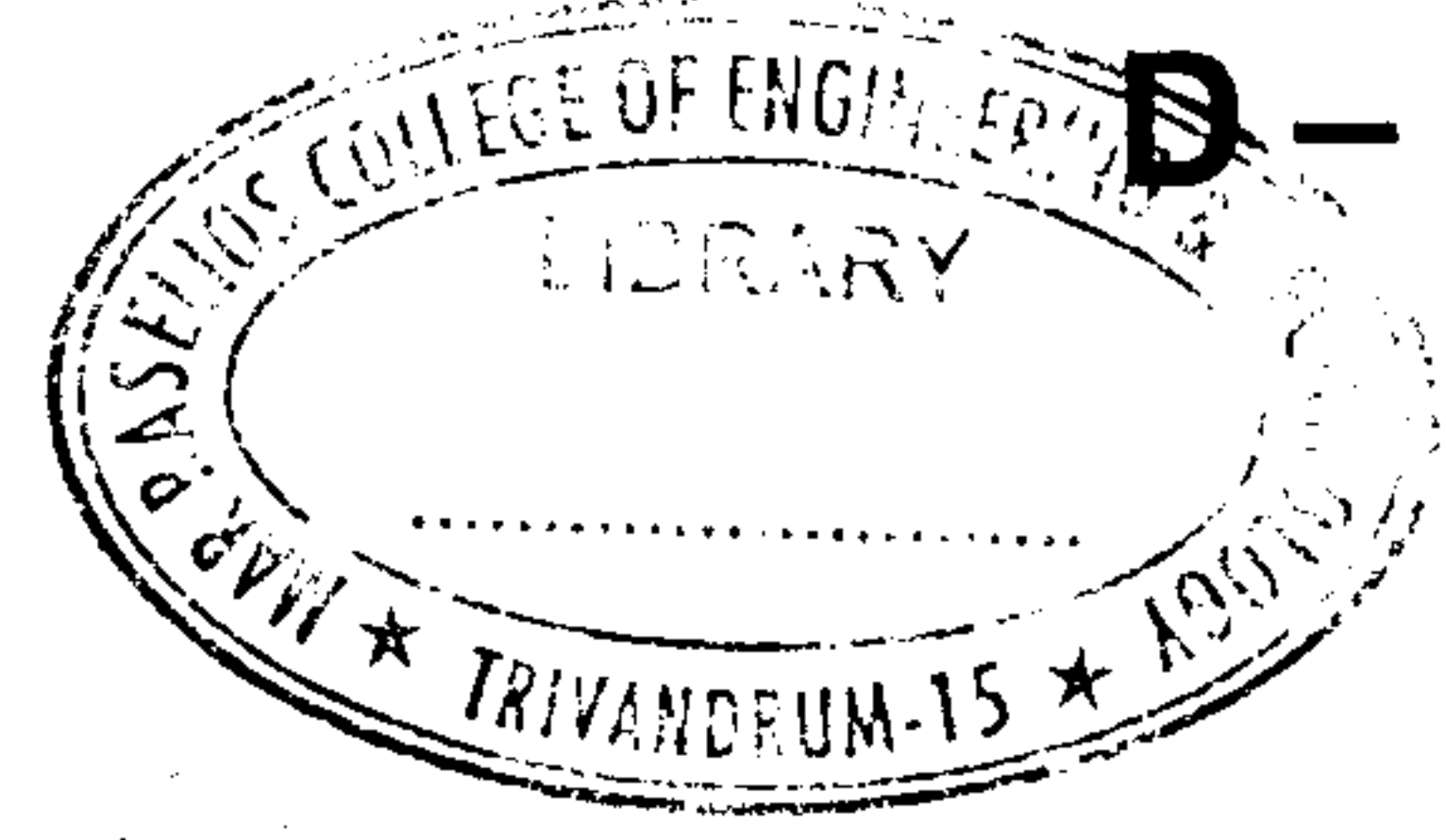




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D – 3556

Reg. No. : .....

Name : .....

**Eighth Semester B.Tech. Degree Examination, December 2017  
(2008 Scheme)**

**08.805 (4) : GRAPH THEORY (Elective – III) (R)  
(Common with F 08.805 C)**

Time : 3 Hours

Max. Marks : 100

**PART – A**

Answer **all** questions.

1. Describe the terms :
  - a) simple graph
  - b) null graph
  - c) complete graph.
2. When are two graphs considered to be isomorphic to each other ? Explain with an example.
3. What is meant by the degree of a vertex ? Prove that in any graph, the number of vertices with odd degree is always even.
4. When is a graph considered to be a tree ? Prove that there is one and only one path between any two vertices in a tree.
5. Define the terms :
  - a) eccentricity
  - b) radius
  - c) diameter in the context of a tree.
6. What is meant by a planar graph ? How many regions does a planar graph with 6 vertices and 10 edges have ?
7. Write short notes on the vector space associated with graphs. What are basis vectors ?

P.T.O.



8. Distinguish between symmetric and asymmetric digraphs. When is a digraph considered to be balanced ?
9. Describe any two methods for the computer representation of graphs.
10. What is meant by an m-cube ? Explain with an example. (10×4=40 Marks)

**PART – B**

Answer **any one full** question from **each** Module. **Each** question carries **20** marks.

**Module – I**

11. a) What is meant by the terms :

- a) walk
- b) path and
- c) circuit ?

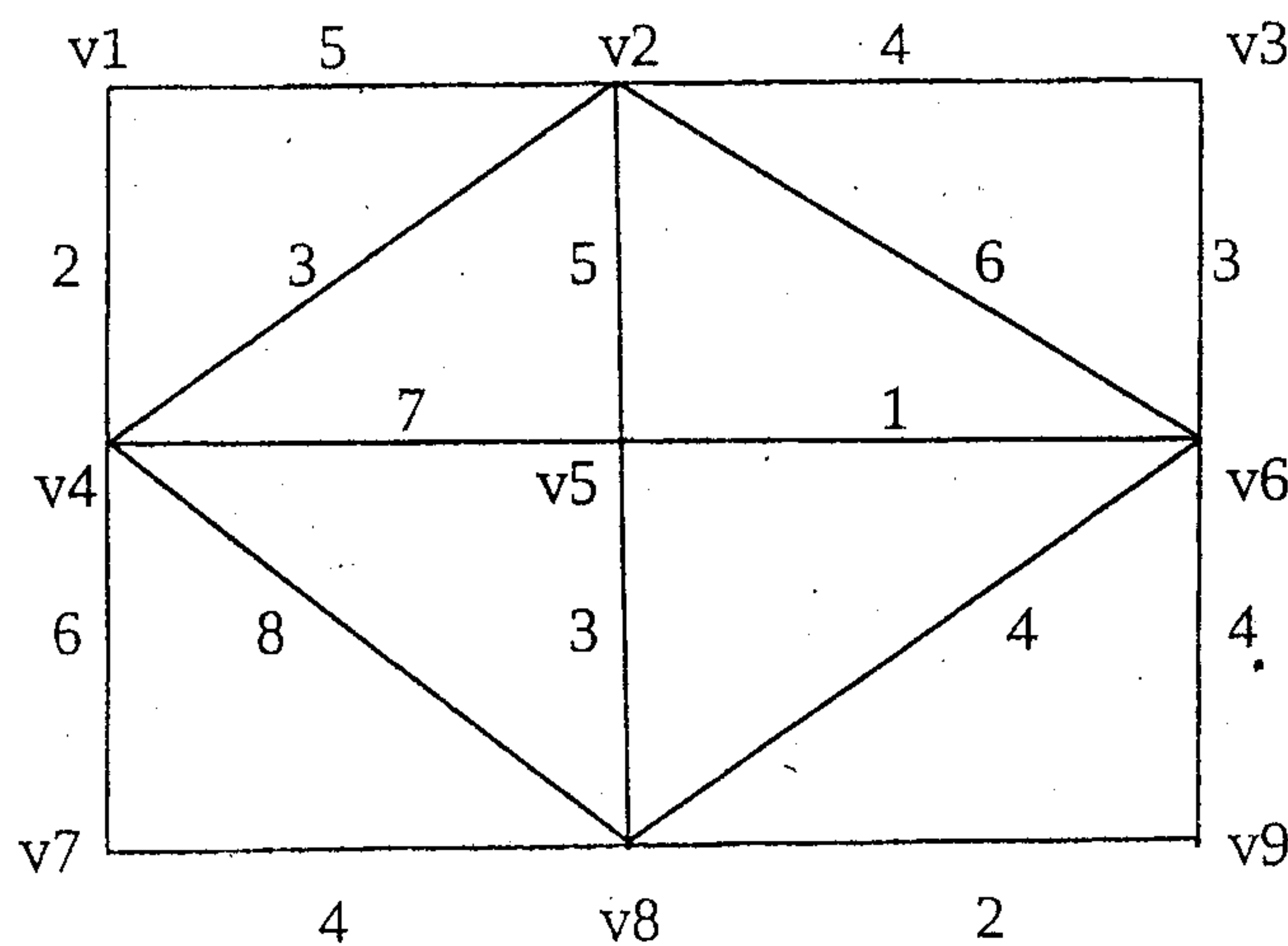
Differentiate between Euler and Hamiltonian graphs with a suitable example for each. What is the necessary condition for a graph to be considered as an Euler graph ? 10

b) State Cayley's theorem. How many different labelled trees of four vertices are possible ? Draw them all. 10

OR

12. a) List and describe the various operations that can be performed on graphs. 10

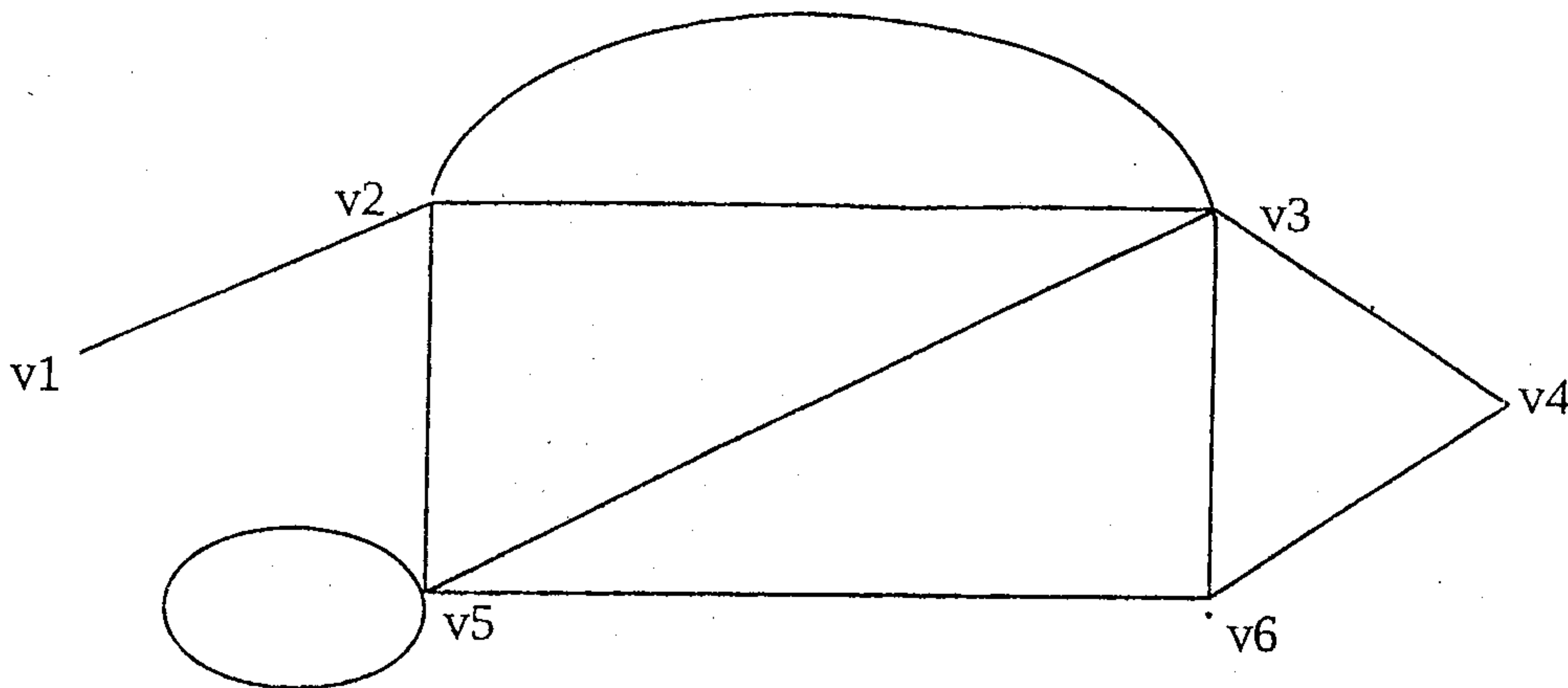
b) What is meant by a minimum spanning tree in the context of weighted graphs ? Use Kruskal's algorithm to find the minimum spanning tree corresponding to the weighted graph given below. 10





**Module - II**

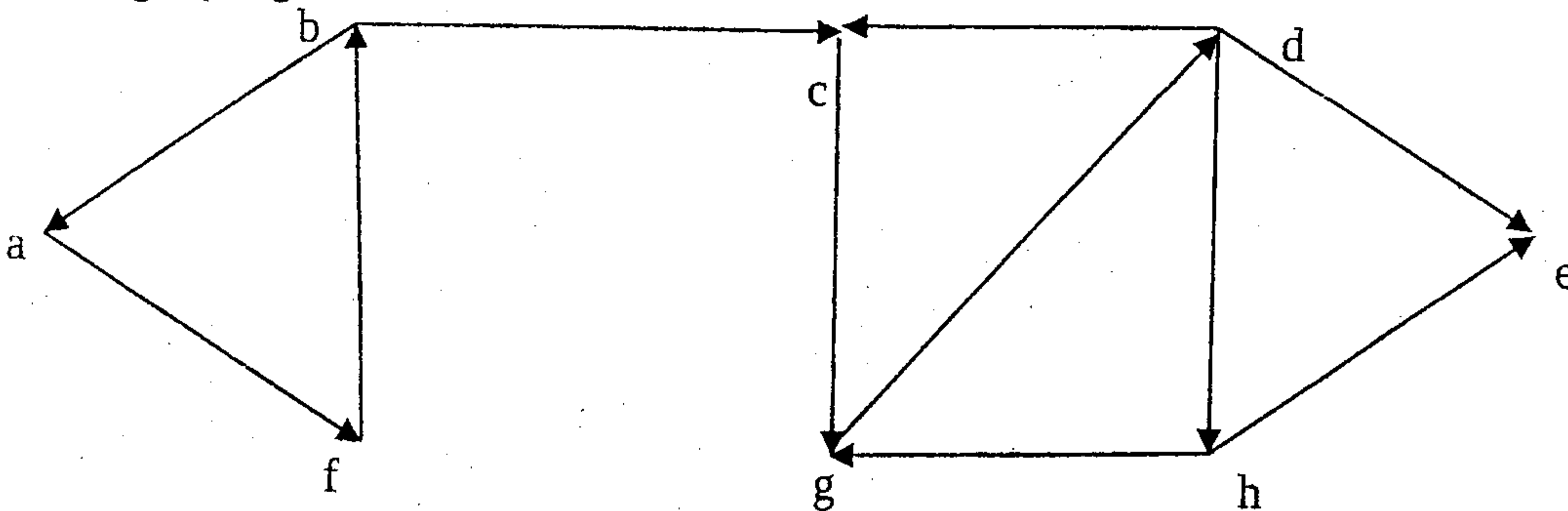
13. a) Describe the steps involved in obtaining the geometric dual of a planar graph. Find the geometric dual of the following graph. 10



- b) Write notes on the application of digraphs for representing binary relations. 10

OR

14. a) Distinguish between strongly connected and weakly connected digraphs. What is meant by the condensation of a digraph? Find the condensation of the digraph given below. 10



- b) List and explain the steps involved in determining whether a given graph is planar. Draw the two Kuratowski graphs and explain their role in planarity testing of graphs. 10

**Module - III**

15. a) Describe the computer algorithm to find the shortest path from a specified vertex to another specified vertex in a simple weighted digraph. 10

- b) What is meant by a contact network? Write detailed notes on the analysis of contact networks. 10

OR

16. a) Describe the computer algorithm to perform depth first searching in graphs. 10

- b) Write detailed notes on the application of graphs in coding theory. 10