



Reg. No. : .....

Name : .....

**Eighth Semester B.Tech. Degree Examination, April 2015  
(2008 Scheme)**

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

Time : 3 Hours

Max. Marks : 100

**PART – A**

Answer **all** questions :

1. What do you mean by edge-disjoint subgraphs ? Give examples.
2. Prove that if a graph has exactly two vertices of odd degree, then there must be a path joining these vertices.
3. Draw a graph that has a Hamiltonian path but does not have a Hamiltonian circuit.
4. Write notes on vector spaces associated with a graph.
5. When are two vectors said to be orthogonal ? What does it imply if the vectors corresponding to two subgraphs of a given graph are found to be orthogonal ?
6. Give one method to determine whether a graph is planar or not.
7. What are self-dual graphs ? Give an example.
8. Write notes on the state graphs of sequential machines with an example.
9. What is an m-cube ? Draw the graph corresponding to a 3-cube.
10. What is a balanced digraph ?



**(10×4=40 Marks)**

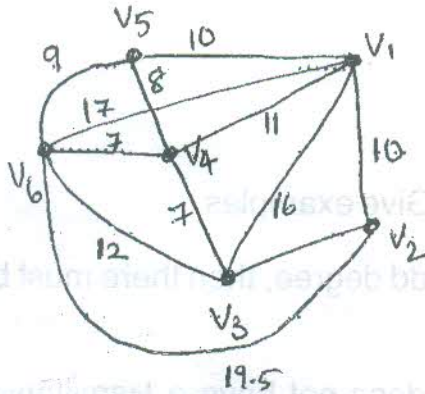


## PART - B

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

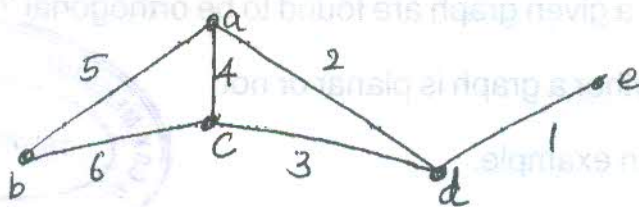
## Module - I

11. a) State Cayley's theorem. How many different trees of 4 labelled vertices are possible according to this theorem? Sketch all of them.
- b) Use Kruskal's algorithm to find the minimal spanning tree in the given graph.



OR

12. a) Sketch all spanning trees of the following graph.



- b) Prove that any subgraph 'g' of a connected graph G is contained in some spanning tree of G if and only if 'g' contains no circuit.



**Module – II**

13. a) Distinguish between strongly and weakly connected digraphs. What do you mean by condensation of a digraph ? Explain with an example.
- b) Prove that the complete graph of five vertices is non-planar.

OR

14. a) What are the different types of digraphs ? What are Euler graphs ?
- b) Discuss about the different representation of planar graphs.

**Module – III**

15. a) Briefly layout the algorithm for finding the shortest path from one vertex to another specified vertex in a graph.
- b) Discuss about the analysis and synthesis of contact networks.

OR

16. a) Discuss about the application of graphs in coding theorem.
- b) Give a method to check whether a graph is isomorphic or not.

