

B.E./B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2011

COMPUTER SCIENCE AND ENGINEERING

36

SIXTH SEMESTER

CS 9032 – Graph Theory

(REGULATIONS - 2008)

Time: 3 Hrs

Max Marks: 100

Answer All Questions

Part – A (10 x 2 = 20 Marks)

1. Define Euler Graph and sub-graph?
2. Draw the disconnected graph with two components?
3. List the properties of Trees?
4. Draw trees of N unlabeled vertices for N=1,2,3,4 and 5?
5. Define cut-vertex and separable graph?
6. What is an path matrix?
7. Differentiate asymmetric diagraph and symmetric diagraph
8. Write the proof for lemma1 ?
9. What transitive closure of a diagraph .
10. List the uses of DFS?

Part – B (5 x 16 = 80 Marks)

11. i) Explain the following (4 X 4 = 16)
- a. Decomposition
 - b. Complete graph
 - c. Walks and Paths
 - d. Edge-Disjoint subgraph

12. A. i. Prove that a Hamiltonian path is a spanning tree (8)
- ii. Explain 2-isomorphism with suitable graphs (8)

(OR)

- B) i. 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. (8)
- ii. Explain Spanning trees in a weighted graph with theorem and proof (8)

13. A) i. Explain the Cut-Set matrix with suitable diagram (8)
ii. Explain incident matrices and its observations with suitable example (8)

(OR)

- B) i. Prove that the chromatic number of a graph will not exceed by more than one the maximum degree of the vertices in a graph (8)
ii. Explain adjacency matrix of a diagram with suitable example (8)
14. A) i. Describe the directed circuits algorithm with diagram (8)
ii. Explain the cut-vertices and severability algorithm (8)

(OR)

- B) i. Write the subroutine for fundamental circuits algorithms (8)
ii. Write subroutine for connectedness and components (8)
15. A) i. Describe the shortest path algorithm from a specified vertex to another specified Vertex (8)
ii. Incident matrix to adjacent matrix (8)

(OR)

- B) i. Explain the Planarity Testing algorithm with two mappings of graph (8)
ii. Describe the isomorphism algorithm with suitable example (8)