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Reg. No. : .....

Name : .....

Eighth Semester B.Tech. Degree Examination, April 2014
(2008 Scheme)
08.805 (4) : GRAPH THEORY (Elective – III)
(Common with F 08.805 C) (R)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions.

1. Show that the maximum no. of edges in a simple graph with 'n' vertices is $n(n-1)/2$.

2. What is meant by (a) chord (b) branch (c) fundamental circuit in the context of a spanning tree ?

3. Draw a connected graph that becomes disconnected when any edge is removed from it.

4. What are planar graphs ? Give one representation of a planar graph.

5. Explain the vector space associated with a graph.

6. What do you mean by condensation of a digraph ?

7. State the Euler formula to find the no. of regions in a planar graph. Use the same to obtain the no. of regions in a graph with 15 vertices and 25 edges.

8. What is a unit cube ? Give the graphical representation of it.

9. Give an algorithm to find the shortest path between a pair of vertices in a directed graph.

10. What are connected components of a graph ? **(10×4=40 Marks)**

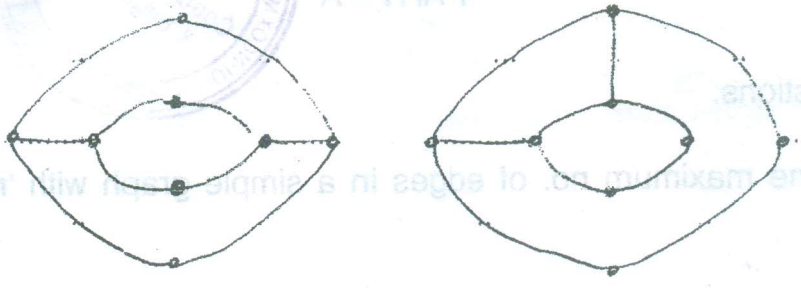
PART – B

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

Module – I

11. a) Explain the different operations that can be performed on graphs.

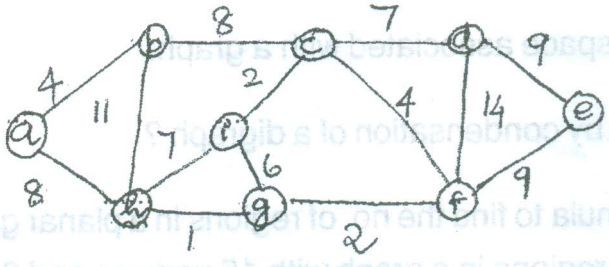
b) Are the two given graphs isomorphic ? Why ?



c) Show that a Hamiltonian path is a spanning tree.

OR

12. a) What do you mean by a minimal spanning tree ? Find the minimal spanning tree of the following weighted graph using Prim's algorithm.



b) What is the no. of different trees that be constructed with 4 distinct vertices ?

Module – II

13. a) What do you mean by geometric dual of a graph ? Illustrate with examples.

    b) Prove that the circuit subspace and the cutset subspace are orthogonal to each other.

OR

14. a) Discuss the binary relations defined on the vertex set of a graph.

    b) Explain Teleprinter's problem and solve it.

Module – III

15. a) Discuss about the different computer representations for graphs.

    b) Discuss an algorithm to obtain all directed circuits of a digraph.

OR

16. a) What is meant by a contact network ? Write notes on the analysis of contact networks.

    b) Write brief notes on the application of graphs in coding theory.