VIII Semester B.Tech Degree Examination

(2013 Scheme)

13. 805.2 GRAPH THEORY(FR) (Elective IV)

Time: 3hrs **Marks: 100**

Part A

(Answer All questions, Each Question carries 4 marks)

1. Differentiate a Walk, Path & Circuit in a Graph.
2. State and prove Euler's theorem involving number of regions, edges and vertices in a planar graph.
3. What is eccentricity of a node? How is it used in finding the center of a graph?
4. Name any two methods used to represent a graph in computers? What are its advantages/disadvantages?
5. How is the transmission between two vertices specified in contact networks. Give an example.

Part B

(Answer Any One question from each module, Each Question carries 20 marks)

Module I

6. a) Prove that the number of vertices of odd degrees will be even. (10)

   b) What are the steps involved in finding a spanning tree of any given graph G(V,E). (10)

7. a) Prove that all trees will have either one or two centers. (10)

   b) Given any graph how can you prove/disprove it to be having a Euler path. Is $K_{3,3}$ Eulerian ? (10)

Module II

8. a) What is a vector space of Graph? Explain with an example. (10)

   b) Differentiate Geometric dual with Combinatorial dual. (10)

9. a) What are strongly connected components? Write a method to find it. (10)

   b) Prove that the complete graph K5 is non planar. (10)

Module III

10. a) Write an algorithm to find out the number of components in a given graph G(V,E). (10)

    b) What are the steps involved in proving that two graphs are isomorphic or not ? (10)

11. a) Explain how the spanning tree algorithm can be used in generating the fundamental circuits in a given graph. (20)

Module IV

12. a) What are m-cubes? Draw the graphs of 3-cube and 4-cube. (10)

b) Write notes on sequential switching networks. (10)

13. a) Draw a contact network with at least 4 vertices and 4 edges. Write its primitive connection matrix and find the transmission matrix from it. Explain the steps involved in finding the transmission matrix from the primitive connection matrix. (20)
