

II B.Tech I Semester Supplementary Examinations, November 2006
APPLIED SYSTEMS ENGINEERING
(Computer Science & Systems Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) What is meant by isomorphism. What are the rules to followed to find whether two graphs are isomorphic to each other or not.
 (b) Prove that in a graph, there are even number of vertices of odd degree. [16]
2. (a) Distinguish between Euler's path and Hamiltonian path. Give suitable example graphs for each.
 (b) Write an algorithm to find the spanning tree from the **given input graph**. [16]
3. (a) Find the dual graph for the following planar graph. Figure 1

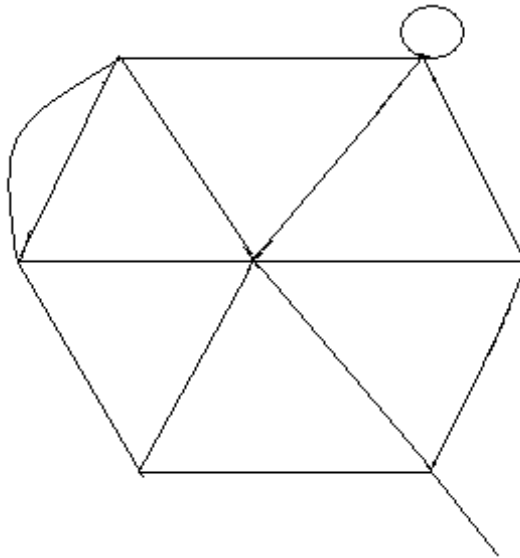


Figure 1:

- (b) Explain about
 - i. augmentation path and
 - ii. max-flow-min-cut theorem [16]
4. (a) Explain the Warshal's algorithm for computing the path matrix, when the adjacency matrix is given as input.
 (b) Explain about the following with suitable examples.
 - i. Cut-set matrix
 - ii. Acyclic digraph [16]

5. (a) Prove by induction that $|E| + |V| = |R| - 2$, where E, V and R denote no. of edges, vertices and regions respectively.
(b) Prove that a complete graph with 5 vertices is not a planar graph. [16]
6. (a) Describe the approaches followed for linear approximation of non-linear systems.
(b) Describe the linear lumped models. Give examples. [16]
7. (a) Give a note about time-invariant systems.
(b) Discuss about the generalized approach to mechanical system modelling. [16]
8. (a) Give a brief note about linear graph models.
(b) What are the parameters considered in the formulation of system equations. [16]
