

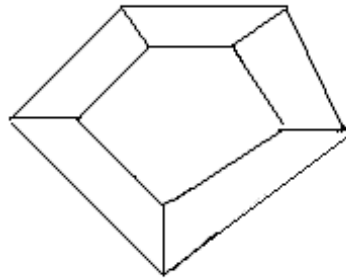
II B.Tech I Semester Supplementary Examinations, May 2005
APPLIED SYSTEMS ENGINEERING
(Computer Science & Systems Engineering)

Time: 3 hours

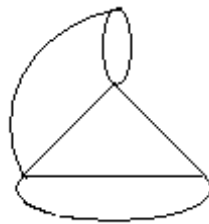
Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Prove that the number of vertices of odd degree in a graph is always even.
- (b) Find whether Hamiltonian circuit or path is present in the following graph.



2. (a) Define the following terms with respect to trees:
 - i. eccentricity
 - ii. center
 - iii. diameter
- (b) Discuss the steps involved in Kruskal's algorithm for shortest spanning tree. Demonstrate with a suitable example.
3. (a) Find the dual of the following graph.



- (b) State and prove that Euler's formula for planar graphs.
4. (a) Explain the steps involved in detection of planarity.
- (b) If x is the adjacency matrix of a graph G , with n vertices and $y = x + x^2 + x^3 + \dots + x^{n-1}$ then G is disconnected if and only if there exist at least one entry in matrix y that is zero.

5. (a) If the following is the best of all spanning trees of a graph G, determine G.
 $\{a, c, d, c\}, \{a, c, d, f\}, \{b, c, d, e\}, \{b, c, d, f, \}, \{a, c, e, f\}, \{b, c, e, f\}, \{a, d, e, f\},$
 $\{b, d, e, f\}, \{a, b, d, e\}, \{a, b, d, f\}$ and $\{a, b, e, f\}$.
- (b) Prove that every completed graph has a directed Hamiltonian path.
6. (a) Discuss about systems approach for modeling.
- (b) Describe the linear lumped models.
7. (a) Explain how the linear approximation is performed on non-linear systems.
- (b) Discuss about various topological models of systems.
8. (a) Describe the systems with multiterminal components.
- (b) Explain the general rules followed in formulation of systems equations.

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