

Exam.Code:1005

Sub. Code: 7692

1128

M. E. (Information Technology)

First Semester

MEIT-101/MEIT-111: Advanced Algorithm Analysis

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

- I. Answer the following and justify with suitable examples:-
- How is space complexity of an algorithm computed?
 - What is Performance measurement?
 - How is fractional knapsack different from 0/1 knapsack?
 - Discuss application of Bipartite matching?
 - Discuss an efficient approach for polynomial representation? (5x2)

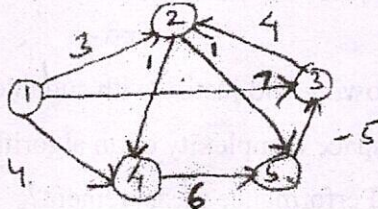
UNIT - I

- II. a) What is machine independent analysis of algorithm? How the time complexity can be represented using Asymptotic notation. Explain the time-space trade-off.
- b) What kind of problems has the time complexity expressed as a recurrence relation?
Explain the Master methods and use it to solve the relation: $T(n) = T(2n/3) + 1$. (5,5)
- III. a) Explain the best and worst case performance of Quick sort algorithm. Discuss the time complexity in each case.
- b) Discuss the application of minimum cost spanning tree? Explain the Prim's algorithm and discuss its implementation using the cost-adjacency matrix? What is the time complexity of the algorithm? (5,5)
- IV. a) What are the similarities and difference between the Greedy approach and Dynamic approach? 0/1 Knapsack problem cannot be solved by greedy approach?
Justify.

P.T.O.

(2)

- b) Solve the following all pair shortest path problem and discuss the time complexity of the algorithm:



(5,5)

UNIT - II

- V. a) Discuss the characteristics of problems that can be solved using the Linear Programming approach? Explain problem formulation with a suitable example.
 b) Define a Flow network and maximum flow problem? Illustrate the working of Ford-Fulkerson method for solving the maximum flow problems. (5,5)
- VI. a) What are online algorithms? Explain the various approaches to solve the online paging problems.
 b) Why is height of the tree significant in binary search tree? What is the need of random generation of binary search tree? How is it carried out? (5,5)
- VII. Write a short note on:-
 a) Deterministic and non-deterministic problems
 b) P, NP and NP-complete problems (5,5)