Code: 13A05406

R13

B.Tech II Year II Semester (R13) Supplementary Examinations December 2016
DESIGN & ANALYSIS OF ALGORITHMS
(Common to CSE and IT)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)
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1 Answer the following: (10 X 02 = 20 Marks)
  (a) Define average case efficiency of an algorithm.
  (b) What is the output of selection sort after the 2nd iteration given the following sequence of numbers: 16, 3, 46, 9, 28 and 14?
  (c) Write any two characteristics of Greedy Algorithm.
  (d) Define principle of optimality.
  (e) Define spanning tree.
  (f) Explain state space tree.
  (g) Explain branch and bound technique.
  (h) Define transitive closure.
  (i) Define tractable and intractable problems.
  (j) Explain NP-complete problem.

PART – B
(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Explain various asymptotic notations used in algorithm design in detail.

OR

3 Discuss the working strategy of merge sort and illustrate the process of merge sort algorithm for the given data: 43, 32, 22, 78, 63, 57, 91 and 13.

UNIT – II

4 Provide optimal solution for the fractional knapsack problem given below using Greedy algorithm. Consider the maximum weight as 6 kg.

Item	1	2	3	4	5
Value (Rs)	25	20	15	40	50
Weight (kg)	3	2	1	4	5

OR

5 Explain multistage graph with an example.

UNIT – III

6 What is an articulation point? Explain the procedure to determine bi-connected components in the graph with example.

OR

7 What is a Hamiltonian cycle? Explain Hamiltonian cycle algorithm with an example.

UNIT – IV

8 Discuss knapsack problem using branch and bound.

OR

9 Describe the procedure for computing transitive closure using lower bound theory.

UNIT – V

10 Discuss NP-Hard and NP-complete problems with suitable examples.

OR

11 Explain the procedure to solve travelling salesman problem using NP-completeness.

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