R16

Code No: 135AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, November/December - 2018
DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE, IT)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A
(25 Marks)

1.a) Write an algorithm to find the number of digits in the binary representation of a positive decimal integer. [2]
  b) How can we measure an algorithm's running time? [3]
  c) What is a set? List the operations that can be performed on it. [2]
  d) Give brief note on graph coloring. [3]
  e) State the Job – Sequencing Deadline Problem. [2]
  f) Find an optimal solution to the knapsack instance n=4 objects and the capacity of knapsack m=15, profits (10, 5, 7, 11) and weight are (3, 4, 3, 5). [3]
  g) What is Travelling Sales Man Problem? [2]
  h) Give the statement of Reliability design problem. [3]
  i) State the methodology of Branch and Bound. [2]
  j) Define Bounding Function? Give the statement of 0/1 Knapsack FIFO BB. [3]

PART - B
(50 Marks)

2.a) Explain Recursive Binary search algorithm with suitable examples.
  b) Distinguish between Merge sort and quick sort. [5+5]

OR

3.a) What is stable sorting method? Is Merge sort a stable sorting method? Justify your answer.
  b) Explain partition exchange sort algorithm and trace this algorithm for n =8 elements: 24,12, 35, 23,45,34,20,48. [5+5]

4. Write and explain the algorithm of Bi connected components with an example. [10]

OR

5. Give the solution to the 8-queens problem using backtracking. [10]

6. What is Minimum cost spanning tree? Explain an algorithm for generating minimum cost Spanning tree and list some applications of it. [10]

OR

7.a) Explain the greedy technique for solving the Job Sequencing problem.
  b) Write with an example of Prim's algorithm. [5+5]

8.a) Discuss the time and space complexity of Dynamic Programming traveling sales person algorithm.

   b) Write an algorithm of matrix chain multiplication.   [5+5]

OR

9. With the help of suitable example explain the all pairs shortest path problem.   [10]

10.a) Give the 0/1 Knapsack LCBB algorithm.

   b) Differentiate between deterministic and non deterministic algorithm.   [5+5]

OR

11. Draw the portion of state space tree generated by LCBB for the 0/1 Knapsack instance: n = 5, (p1,p2,...,p5) = (10,15,6,8,4), (w1,w2,..,w5) = (4,6,3,4,2) and m=12. And also find an optimal solution of the same.   [10]

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