PVP 19

Code: 19CS3404, 19IT3404

II B.Tech - II Semester – Regular Examinations – AUGUST 2021

DESIGN AND ANALYSIS OF ALGORITHMS

(Common to CSE, IT)

Duration: 3 hours Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.
2. Part-A contains 5 short answer questions. Each Question carries 2 Marks.
3. Part-B contains 5 essay questions with an internal choice from each unit. Each question carries 12 marks.
4. All parts of Question paper must be answered in one place

PART – A

1. a) Define the term Algorithm.
   b) Find out any two drawbacks of Binary Search algorithm.
   c) Define Minimum cost spanning tree.
   d) Define Dynamic Programming strategy.
   e) Define E-node.

PART – B

UNIT – I

2. a) Discuss various Asymptotic notations used for best case, average case and worst case analysis of algorithms. 6 M
   b) Find the Time complexity of Iterative sum algorithm? 6 M

OR

3. a) Demonstrate Brute Force Technique with an example. 6 M

b) Explain various types of Asymptotic notations with examples. 6 M

UNIT – II

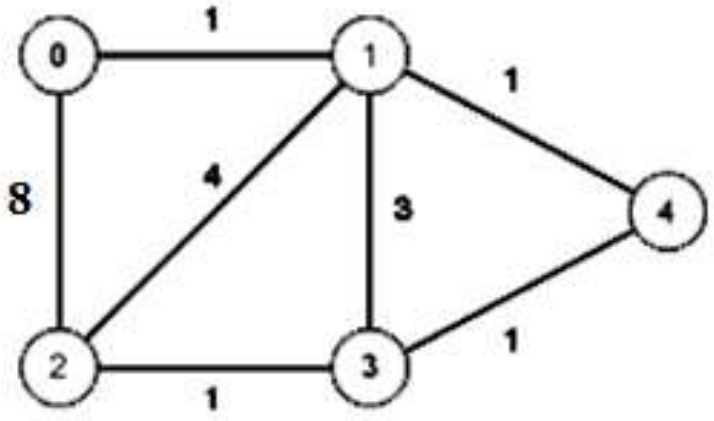
4. a) Explain Quick sort algorithm and simulate it for the following data: 6 M
   20, 35, 10, 16, 54, 21, 25
   b) Illustrate Merge sort algorithm and discuss Time complexity in both worst case and average case. 6 M

OR

5. a) Solve Recurrence relation for Strassen's Matrix multiplication problem. 6 M
   b) Solve the following Recurrence relation 6 M
   $T(n)=2\ T(n/2) + n$, and $T(1)=2$

UNIT-III

6. a) Discuss Huffman Tree with suitable example. 6 M
   b) Construct Minimum cost spanning tree using Prim's algorithm. 6 M



OR

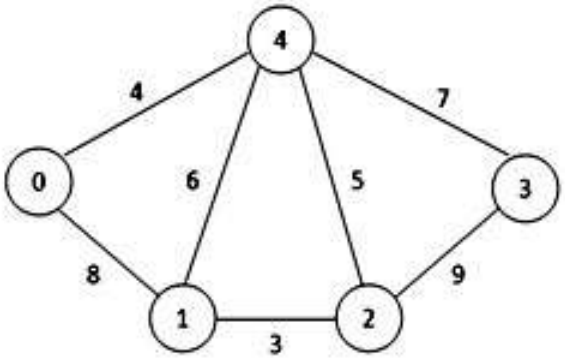
7. a) Explain Single source shortest path problem with example using Greedy method. 6 M

b) Calculate the Optimal solution for Job sequencing with deadlines using Greedy method. N=4, Profits (p1,p2,p3,p4) = (100,10,15,27), Deadlines (d1,d2,d3,d4) = (2,1,2,1). 6 M

UNIT – IV

8. a) Explain 0/1 Knapsack problem with example. 6 M

b) Calculate shortest distances using All pairs shortest path algorithm. 6 M



OR

9. a) Find the shortest tour of Traveling sales person for the following cost matrix using Dynamic Programming. 6 M

$$\begin{bmatrix} \infty & 12 & 5 & 7 \\ 11 & \infty & 13 & 6 \\ 4 & 9 & \infty & 18 \\ 10 & 3 & 2 & \infty \end{bmatrix}$$

b) Explain Principle of optimality in Dynamic Programming with suitable example. 6 M

UNIT – V

10. a) Write an algorithm for N-Queens problem using Backtracking. 6 M

b) Illustrate NP-Completeness with suitable example. 6 M

OR

11. a) Use Backtracking technique, solve the following instance for the Subset sum problem, s=(6,5,3,7) and d=15. 6 M

b) Discuss about Assignment problem with suitable example. 6 M