INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

B.Tech IV Semester End Examinations (Regular), November – 2020
Regulation: IARE–R18
DESIGN AND ANALYSIS OF ALGORITHMS
Time: 2 Hours   (CSE | IT)   **Max Marks: 70**

Answer any Four Questions from Part A
Answer any Five Questions from Part B

PART – A

1. Describe the role of space complexity and time complexity of a program? **[5M]**

2. What are biconnected components? Explain. **[5M]**

3. What are the steps for dynamic programming? Explain principal of optimality. **[5M]**

4. Write short notes on graph colouring. **[5M]**

5. Explain chromatic number decision problem. **[5M]**

6. What is an algorithm? How it differ from flowchart? Discuss key characteristics of algorithm. **[5M]**

7. How do you solve job sequencing with deadlines using greedy method questions? **[5M]**

8. Explain intractable problems with examples. **[5M]**

PART – B

9. Explain quick sort algorithm and simulate it for the following data 52, 37, 63, 14, 17, 8, 6, 25. **[10M]**

10. Demonstrate binary search method to search key = 23, form the array A=<2,5,8,12,16,23,38,56,72,91>. **[10M]**

11. Describe the breadth first search algorithm of a graph and explain with an example. **[10M]**

12. Write non-recursive algorithm for in-order binary tree traversal. Illustrate about disjoint set operations.

[10M]

13. Consider 0-1 Knapsack capacity W=50, w=(10,20,30) and v=(60,100,120). Find the maximum profit using dynamic programming. **[10M]**

14. What is travelling salesman problem and how is it modeled as a graph problem? **[10M]**

15. Apply backtracking technique to solve the following instance of the subset sum problems.s=(1,3,4,5) & d=11.

[10M]

16. Differentiate branch and bound and back tracking algorithm. Write the steps for backtracking and branch-and-bound algorithms. **[10M]**

17. What is P, NP, NP-complete and NP-hard problems? Explain "P=NP ?" problem. **[10M]**

18. Write notes on deterministic and non-deterministic algorithm with example. **[10M]**

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