

Code No.: (R22IT502PC)

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CMR ENGINEERING COLLEGE: : HYDERABAD  
UGC AUTONOMOUS

III-B.TECH-I-Semester End Examinations (Regular) - December- 2024  
DESIGN AND ANALYSIS OF ALGORITHMS

(IT)

[Time: 3 Hours]

[Max. Marks: 60]

**Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 10 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.

**PART-A**

**(10 Marks)**

1. a) What are the applications of divide and conquer. [1M]
- b) Write the time complexity of merge sort and Quick sort. [1M]
- c) What is weighting rule for Union. [1M]
- d) Define n-Queens Problem. [1M]
- e) Write general method of dynamic programming. [1M]
- f) How to design reliability? [1M]
- g) Give two real time problems that could be solved using greedy algorithm. [1M]
- h) What are the different Tree traversals? [1M]
- i) Define the following terms live node and E-node. [1M]
- j) Explain the P, NP classes. [1M]

**PART-B**

**(50 Marks)**

2. What is meant by time complexity? Define different time complexity notations. Give examples one for each. [10M]
- OR**
3. Explain Big-oh notation and Little-oh notation with an example. [10M]
4. Determine weighted union and collapsing find algorithm With an Example. [10M]
- OR**
5. What is general method of back tracking? Explain N queen problem. [10M]
6. Evaluate 0/1 knapsack problem with dynamic programming. [10M]
- OR**
7. Write and explain Algorithm for OBST. [10M]
8. Solve the following problem of Job sequencing with the dead line specified using Greedy strategy. (evaluating) [10M]  
 $N=4, (p_1, p_2, p_3, p_4) = (100, 10, 15, 27) (d_1, d_2, d_3, d_4) = (2, 1, 2, \text{and } 1).$
- OR**
9. Explain briefly about Bi-connected components with example. [10M]
10. Explain General method of Branch and Bound. [10M]
- OR**
11. Briefly explain the concepts of the NP-Hard and NP-Complete? Differentiate between NP-Complete and NP-Hard. [10M]

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