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**M.Tech. 2nd Semester (CSE) CBCS Scheme
Examination, May-2017
ALGORITHM DESIGN
Paper-MTCSE22C2**

Time allowed : 3 hours] [Maximum marks : 100

Note : Attempt any five questions, selecting one question from each unit and question number one is compulsory.

1. (a) How can you modify Quick sort algorithm to search an item in a list of elements ? $5 \times 5 = 20$
(b) What are three properties of NP-Complete problem ?
(c) Can the master method be applied to solve recurrence :
$$T(n) = 4 T(n/2) + n^2 \log n$$

Justify your answer.
(d) Explain Branch and Bound technique.

Unit-I

2. (a) What do you mean by time complexity of an algorithm ? Explain notations used to denote the time complexity of an algorithm. 10
(b) Write algorithm for Union and find operations for disjoint sets. 10

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[P.T.O.]

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22644

3. Explain Red-Black tree with suitable example. 20

Unit-II

4. What do you mean by dynamic programming ?
Explain O/I Knapsack problem by using dynamic programming. 20
5. (a) What is backtracking ? Solve 8 Queen's problem
with Backtracking. 10
- (b) What is sum of subset problem ? How it can be
solved using backtracking. 10

Unit-III

6. (a) Explain NP-Hard problems with example. 10
- (b) Explain NP-Scheduling problems. 10
7. Explain Boyer-Moore Algorithm with example. 20

Unit-IV

8. Explain fully polynomial time approximation
schemes. 20
9. Discuss the following : 10×2=20
- (a) PRAM Models
- (b) Polynomial time approximation.

22644