

13-12-2019

Roll No.

Total Pages : 3

MCA/D-19

10017

DESIGN AND ANALYSIS OF ALGORITHMS

Paper—MCA-1433

Time Allowed : 3 Hours]

[Maximum Marks : 80

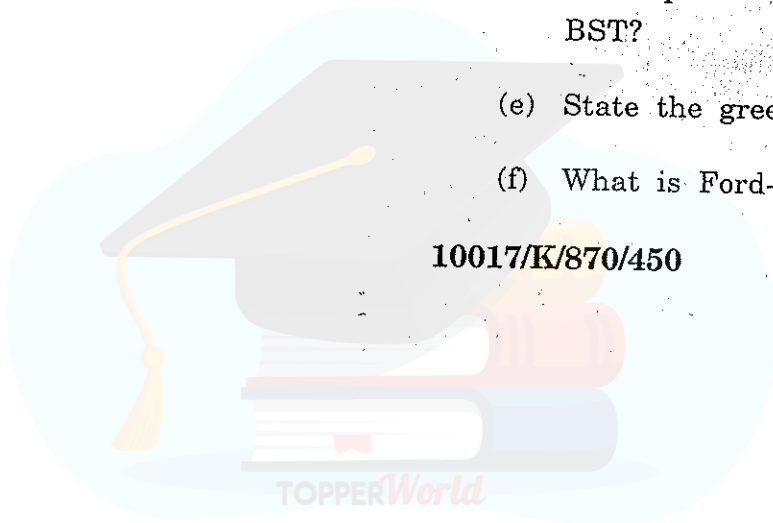
Note: Attempt **five** questions in all. Question No. **one** is compulsory. Attempt **four** more questions selecting exactly **one** question from each Unit. All questions carry equal marks.

UNIT-I

1. (a) What kinds of problems are solved by algorithms?
- (b) What do you understand by comparison sorting?
- (c) What is meant by hash function?
- (d) How optimal BST is different from a normal BST?
- (e) State the greedy choice property.
- (f) What is Ford-Fulkerson method?

10017/K/870/450

P. T. O.



(g) What are the various ways to store string in computer memory?

(h) What is an approximation algorithm? $8 \times 2 = 16$

UNIT-I

2. (a) What is meant by complexity of algorithms? How can you calculate complexity of any algorithm? Explain using suitable examples. 8

(b) Explain the concept of back substitution method for solving recursive equations using suitable examples. 8

3. Write the algorithm to perform sorting using heapsort and perform its analysis. Also explain the algorithm using suitable example. 16

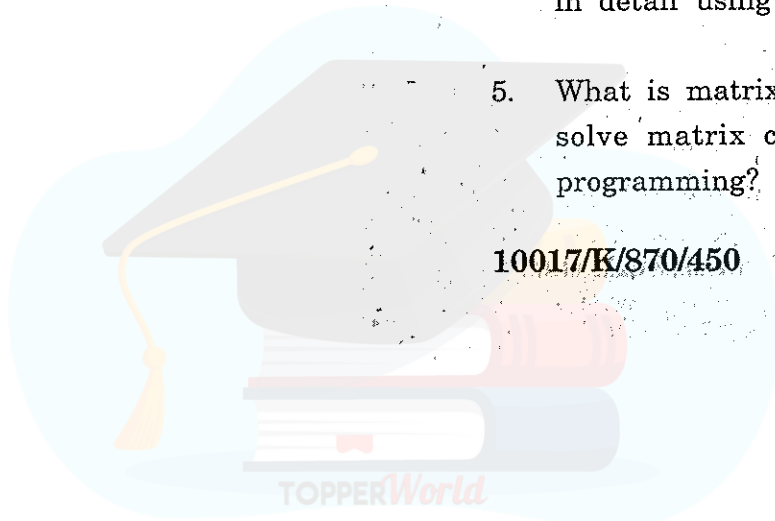
UNIT-II

4. What is meant by collision handling in hashing? Describe the various techniques to handle collisions in detail using suitable examples. 16

5. What is matrix chain multiplication? How can you solve matrix chain multiplication using dynamic programming? Explain in detail. 16

10017/K/870/450

2



UNIT-III

6. What is Activity Selection problem? How can solve this problem? Explain using appropriate examples with complete solution. 16
7. Compare and contrast the various single source shortest path algorithms. Also provide examples for each. 16

UNIT-IV

8. (a) Write and explain the Naive string matching algorithm. 8
(b) How the polynomial time verification is done? Explain using suitable examples. 8
9. (a) Prove that travelling salesman problem is NP-Complete. 8
(b) Prove that the circuit-satisfiability problem belongs to the class NP. 8

10017/K/870/450

3

