Reg. No. : ....

Name : ....

Second Semester M.C.A. Degree (C.B.S.S. – Reg./Supple./Imp.) Examination, May 2024
(2020 Admission Onwards)
MCA2 C01 : ALGORITHMS AND DATA STRUCTURES

Time : 3 Hours

Max. Marks : 60

SECTION – A

Answer **all** questions. **Each** question carries **two** marks.

1. Explain the characteristics of an algorithm.

2. Explain dynamic programming.

3. Differentiate between space complexity and time complexity.

4. Define the recursion tree method for solving recurrences.

5. What are the various operations possible on the stack ?

6. What are arrays ?

7. A complete binary tree contains 15 nodes. Calculate the depth of the tree.

8. Differentiate between depth and level of a tree.

9. What is the best case and average case complexity of binary search ?

10. Define the minimum spanning tree.

(10×2=20)

SECTION – B

Answer **all** questions. **Each** question carries **eight** marks.

11. a) List out and discuss the sequence of steps involved in the development of an algorithm with a neat diagram.

OR

b) List out any four important problem types in the study of algorithms.

P.T.O.

12. a) Explain the master method for solving recurrences.

OR

b) Explain NP - Hard and NP - Complete problems in detail.

13. a) Explain the enqueue and dequeue operations on the queue using algorithms.

OR

b) Explain how to implement insert and delete operations in a doubly linked list.

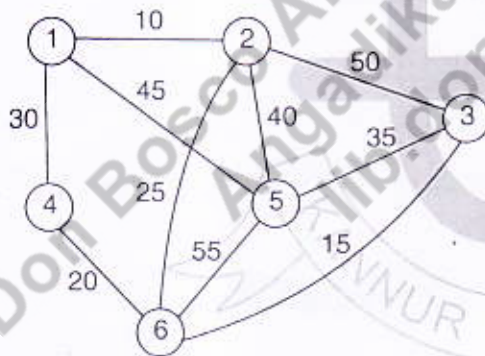14. a) Explain different binary tree representation methods.

OR

b) Explain tree traversal and its types using an example.

15. a) Explain any two graph representation techniques.

OR

b) Explain Kruskal's algorithm to find the minimum cost spanning tree for the given graph below :

(5×8=40)