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MCA (Sem. - 3rd)

DATA STRUCTURES

SUBJECT CODE : MCA-302 (N2)

Paper ID : [B0112]

[Note: Please fill subject code and paper ID on OMR]

Time : 03 Hours **Maximum Marks : 60**

Instruction to Candidates:

1) Attempt any **One** question from each Sections - **A, B, C & D.**
2) Section - E is **Compulsory.**
3) Use of Non-programmable **Scientific Calculator** is allowed.

Section - A

(1 × 10 = 10)

Q1) What is meant by stack? Write push and pop functions of C++ to manipulate a stack as an array.

Q2) (a) What are the various applications of linked list?

(b) Write an algorithm for deleting an element from the linked list.

Section - B

(1 × 10 = 10)

Q3) What are basic trees? Discuss the various relationships that exist between the various nodes of a tree.

Q4) What is meant by traversing a tree? Write a program in C to transverse a binary tree using Preorder traversal.

Section - C

(1 × 10 = 10)

Q5) Explain the various graph representation methods. List merits and demerits of each.

Q6) (a) Write a program in C to insert a vertex into a graph.

(b) Explain Dijkastra's algorithm.

Section - D

(1 × 10 = 10)

Q7) What is the use of searching techniques? Discuss the various searching techniques with help of examples.

Q8) Explain the following:

(a) Radix sort

(b) Quick sort

Section - E

(10 × 2 = 20)

Q9)

a) Define Time space trade off.

b) In which condition we should not use recursion?

c) Write the following expression in Polish notation. (36/3) + 4) –28/4)

d) List some drawbacks of linear queue.

e) When an expression can be evaluated?

f) What is meant by level of a tree?

g) What is adjacency structure?

h) What are AVL trees? What are its advantages?

i) What is depth first traversal of a graph?

j) Define sorting and list two popular sorting techniques.

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