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MCS-405

Data Structure and Program Methodology

(MSCIT-21/PGDCA-20)

2nd Semester Examination, 2021 (Winter)

Time : 2 Hours] **Max. Marks : 80**

Note : This paper is of Eighty (80) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

SECTION–A

(Long Answer Type Questions)

Note : Section 'A' contains Five (05) long answer type questions of Twenty (20) marks each. Learners are required to answer any Two (02) questions only.

(2×20=40)

1. Explain binary search and how we can implement binary search on unsort array also write a program for same.

2. Describe algorithm and properties of algorithm. Write an algorithm to display the Fibonacci series till its 20th element.

3. Explain any sorting algorithm and write a program in C for sorting a given list by using Insertion Sort : 20, 32, 5, 6, 89, 4, 30, 8, 10.

4. Describe the LIFO concept and write a C program to implement stack with array. Perform push and pop operation.

5. Write notes on following :

(a) directed graphs.

(b) undirected graphs.

(c) complete graphs.

(d) tree.

(e) degree, indegree and outdegree of graph.

SECTION–B

(Short Answer Type Questions)

Note : Section 'B' contains Eight (08) short answer type questions of Ten (10) marks each. Learners are required to answer any Four (04) questions only. (4×10=40)

1. Write down the best, worst and average case time complexity of sequential search.

2. What is linked list and what are the advantages of using a linked list over arrays?

3. What is asymptotic notation and Define Big Theta and Big Oh asymptotic notation?

4. Define Bubble Sort with example.

5. What is Queue? What are its properties? What are the applications of queue?

6. Explain Dynamic memory allocation and what is the difference between the functions malloc() and calloc()?

7. Distinguish between Breadth First and Depth First search traversal in a graph.

8. What do you mean by traversing? Explain different traversal methods of binary tree.