P-860

MIT CS-401

Data Structure

M.Sc. Cyber Security (MSCCS)

4th Semester Examination, 2023 (June)

Time : 2 Hours]   **Max. Marks : 70**

Note : This paper is of Seventy (70) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein. Candidates should limit their answer to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

SECTION–A
(Long Answer Type Questions)

Note : Section 'A' contains Five (05) long answer type questions of Nineteen (19) marks each. Learners are required to answer any Two (02) questions only.

$(2\times19=38)$

1. What do you mean by dynamic memory allocation? Explain the following :

(a) malloc().

(b) calloc(),

(c) reallocc() and

(d) free().

2. How the asymptotic notations are used in evaluating algorithms? Define *Big Theta* and *Big Oh* asymptotic notation.

3. Explain *Stack*. What are the different operations that can be implemented on stack?

4. What are the advantages and disadvantages of sequential search technique? Write down the best, worst and average case time complexity of sequential search.

5. Explain quick sort. Sort the following elements using quick sort and explain each pass. 48 29 8 59 72 88 42 65 95 19 82 68. How many passes are required to sort the elements?

SECTION–B
(Short Answer Type Questions)

Note : Section 'B' contains Eight (08) short answer type questions of Eight (08) marks each. Learners are required to answer any Four (04) questions only.   (4×8=32)

1. What is pointer? How is a pointer initialized?

2. Write an algorithm to find whether a given number is even number or odd number.

3. What is linked list? What are the advantages of using linked list over arrays?

4. Write a program to sort the given list using bubble sort. The list is 2, 42, 45, 87, 69, 14, 13, 8,10.

5. Distinguish between *directed* and *undirected* graph.

6. Define an AVL tree. State whether the following statement is true or false? "The AVL tree is a binary search tree that's always in balance'

7. What do you mean by Direct Addressing? Explain.

8. Differentiate between linear probing and quadratic probing.

―――――――