Roll No : .....

Total No. of Questions : **11**] [Total No. of Printed Pages : **3**

SP–724

M.Sc. (Final) Examination, 2021

INFORMATION TECHNOLOGY

Paper - MIT-201

(Data and File Structure using C/C++)

Time : 1½ Hours] [*Maximum Marks : **50***

Section–A **(Marks : 2 × 10 = 20)**

Note :– Answer all *ten* questions (Answer limit **50** words). Each question carries **2** marks.

Section–B **(Marks : 3 × 5 = 15)**

Note :– Answer all *five* questions. Each question has internal choice (Answer limit **200** words). Each question carries **3** marks.

Section–C **(Marks : 5 × 3 = 15)**

Note :– Answer any *three* questions out of five (Answer limit **500** words). Each question carries **5** marks.

Section–A 2 each

1. Attempt all questions. Answer should not exceed **50** words in each question.

   (i) What do you mean by Constant ? Explain various types of constant.

   (ii) Describe operators in brief.

(iii) What is Recursion ?

(iv) Explain Dynamic Memory Allocation.

(v) What is Complexity ?

(vi) Explain Big 'O' notation.

(vii) What is Deque ?

(viii) What do you mean by Back-tracking ?

(ix) Explain BFS.

(x) Write an algorithm for Binary Search.

Section–B 3 each

Note :– Attempt all questions. Answer should not exceed **200** words in each question.

2. What is an Algorithm ? Write an algorithm to print the Fibonacci series.

Or

What do you mean by Array ? Explain 2-D array with an example.

3. What is a Structure ? How is it declared ? Define a structure to represent a data.

Or

What do you mean by Pointer ? Explain pointer arithmetic with an example.

4. What is Linked List ? What are the advantages of linked list over arrays ?

Or

Define an Algorithm. List the characteristics of a good algorithm.

5. Convert the following infix expression into post fix expression using stack :

A * (B + C ^ D) – E ^ F * (G/H)

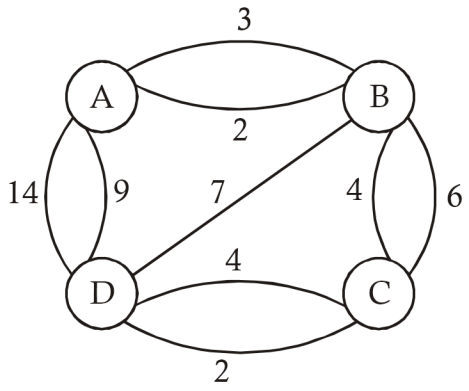
Or

What is a Circular queue ? How do you represent it ?

6. Draw an AVL Tree for nodes 25, 45, 50, 55, 60, 65, 75 and explain its stages.

Or

Find a minimum spanning tree T of the graph in the figure given below (By using Prims and Kruskal's algorithm) :



Section–C 5 each

Note :– Attempt any *three* questions out of five. Answer should not exceed **500** words in each question.

7. What do you mean by control statements ? Explain its types.

8. What is Function ? Explain call by value and call by reference with an example.

9. Explain Doubly and Circular Linked list in detail.

10. Explain Tower of Hanoi with an example.

11. Sort the following elements using bubble sort :

    25, 9, 41, 130, 15, 30

    Also write an algorithm and find the complexity of bubble sort.