MASTER OF COMPUTER APPLICATION
THIRD SEMESTER (REPEAT)
DATA STRUCTURE
MCA-301

Duration: 3 Hrs. Marks: 70

PART : A (OBJECTIVE) = 20
PART : B (DESCRIPTIVE) = 50

[PART-B : Descriptive]

Duration: 2 Hrs. 40 Mins. Marks: 50

[Answer question no. One (1) & any four (4) from the rest]

1. What is an array and a string? Differentiate between them. Write a program to compare two strings and show a suitable message based on the comparison result. (4+3+3=10)

2. What is a data structure? Differentiate between primitive and non primitive data structure. (5+5=10)

3. What is a function? What do you mean by function argument? What is the necessity of using function arguments, explain. (3+4+3=10)

4. What is the difference between call by value and call by reference parameter passing mechanism? Write a program to interchange the values of 2 numbers using call by reference. (5+5=10)

5. What kind of information does a pointer variable represent? Write a program to calculate the sum and average of the numbers in an array using pointer. (5+5=10)

6. What technique is used in Linked list? Describe diagrammatically the node structure of the three types of linked list. (4+6=10)

7. What is the importance of stack? List three applications of stack and give reasons for each of them why stack would be preferable. (4+6=10)

8. Define a queue. How does it differ from stack? Explain the types of queue diagrammatically. (2+3+5=10)

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[PART-A : Objective]

Choose the correct answer from the following: **1×20=20**

1. The _____ is the specification of logical and mathematical properties of data types or structures.
   a. Linear data structure
   b. Homogeneous data structure
   c. Static structure
   d. Abstract data type

2. A/an _____ is a self contained program segment that carries out some specific, well defined task.
   a. Argument
   b. Parameter
   c. Function
   d. Return statement

3. The _____ function joins two strings.
   a. strcmp( )
   b. strcat( )
   c. strrev( )
   d. strcpy( )

4. A _____ is a variable that is used to hold the address of another variable.
   a. Typedef
   b. Address operator
   c. Pointer
   d. Structure

5. The _____ allows to allocate additional memory space or to release unwanted space during run time which deals to optimize the use of memory space.
   a. Static memory allocation
   b. Dynamic memory allocation
   c. Single dimension Array
   d. Multi dimension Array

6. In a _____ linked list, the next pointer field of the last node contains the address of the first node rather than the NULL pointer.
   a. Single b. Linear
   c. Double d. Circular

7. The function that calls itself within its definition is called:
   a. Recursive function
   b. Function without any argument
   c. Function with return type
   d. Function with no return type

8. The _____ is an ordered collection of homogeneous data elements where the insertion and deletion operations take place only at one end.
   a. Infix notation b. Postfix notation
   c. Stack d. Queue

9. Queue is a _____ list.
   a. Circular Linked.
   b. Last In First Out.
   c. First In Last Out.
   d. First In First Out.

10. A _____ is a simple, acyclic and connected graph.
    a. Tree b. BST
    c. Stack d. Queue

11. A graph is said to be _____ if the pair(u, v) is unordered where (u, v) and (v,u) represent the same edge.
    a. Directed graph b. Undirected graph
    c. Weighted graph d. Complete graph

12. In Stack we insert data from:
    a. Front End b. Rear End
    c. Both End d. Top End

13. The _____ will use a queue and _____ will use a stack as an auxiliary structure to hold vertices for future processing.
    a. Spanning tree, minimum spanning tree
    b. Directed graph, undirected graph
    c. Breadth first search, depth first search
    d. Graph, tree

14. The _____ is an operation of arranging a set of data elements in a specific order.
    a. Searching b. Sorting
    c. Binary search d. Heap sort

15. The _____ is the spanning tree in which the sum of weights of the edges is minimum.
    a. Adjacency list
    b. Pendant
    c. Adjacency matrix
    d. Minimum spanning tree

16. Number of sub trees of a node in a Tree is called:
    a. Order
    b. Degree
    c. Level
    d. Depth

17. To identify a member element of a structure we use:
    a. dot (.) operator
    b. plus(+) operator
    c. * operator
    d. & operator

18. Which of the following statement is false?
    a. In a circular queue, overflow occurs more frequently than in a simple queue.
    b. In a deque, insertion and deletion of elements can take place on either end.
    c. In a priority queue, insertion of new elements always takes place at one end.
    d. None of the above.

19. In linked list representation, a node contains at least:
    a. node address field, data field
    b. node number, data field
    c. information field, next address field
    d. none of the above

20. An ordered set of items from which items may be deleted or inserted at either end:
    a. Queue
    b. Graph
    c. Heap
    d. Dequeue

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UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA

[PART (A) : OBJECTIVE]

Duration : 20 Minutes

Serial no. of the main Answer sheet

Course : .....

Semester : ..... **Roll No :** .....

Enrollment No : ..... **Course code :** .....

Course Title : .....

Session : 2017-18 **Date :** .....

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Instructions / Guidelines

- The paper contains twenty (20) / ten (10) questions.
- Students shall tick (✓) the correct answer.
- No marks shall be given for overwrite / erasing.
- Students have to submit the Objective Part (Part-A) to the invigilator just after completion of the allotted time from the starting of examination.

Full Marks	Marks Obtained
20	

Scrutinizer's Signature *Examiner's Signature* *Invigilator's Signature*