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# AS-431

## M.Sc. (Computer Sc.) II Semester (New) Examination July 2019

## DATA STRUCTURE AND ALGORITHMS

Paper - MCSC- 201

*Time Allowed : Three Hours]* *[Maximum Marks : 85*

**Note :** All questions are compulsory.

### Section - A
### Objective Type Questions

$10 \times 1 = 10$

Q.1. Choose correct answer.

i) The memory address as the first element of an array is called

(a) Base address

(b) Floor address

(c) Foundation address

(d) None





ii) The first element in the array is numbered 0, so the last element is _____ than the size of the array.

(a) 1 less

(b) 1 greater

(c) Half

(d) None

iii) The data structure required to check whether an expression contains. balanced parenthesis is.

(a) Stack

(b) Queue

(c) Tree

(d) Array

iv) _____ is very useful in situation when data have to stored and then retrieved in reverse order.

(a) Stack

(b) Queue

(c) List

(d) Link list

v) A full binary tree with 2n+1 nodes contain

(a) n leaf node

(b) n non leaf node

(c) n-1 leaf node

(d) (n-1) non leaf node

vi) A linear collection of data elements where the linear node is given by means of pointer is called? http://www.onlinebu.com

(a) Linked list

(b) Node list

(c) List

(d) None

vii) In doubly linked lists, traverser can be performed?

(a) Only in forward direction

(b) Only in reverse direction

(c) In both direction

(d) None





viii) A graph is a collection of nodes, called ___ and line segments called ___ that connect pair of nodes.

(a) Vertices, path

(b) Vertices, edges.

(c) Graph node, edge

(d) Edges, vertices.

ix) Which of the following technique is used by quick sort

(a) Backtracking

(b) Divide-and -Conquer

(c) Grid method

(d) Heuristic approach

The complexity of merge sort algorithm is ____.

(a) O(n)

(b) O(logn)

(c) O(n2)

(d) O(nlogn)

## Section - B

### Short Answer Type Questions

$5 \times 5 = 25$

Q.2. What is sparse matrices? Explain.

OR

What is Abstract data types? Explain in detail.

Q.3. Write the algorithm for post fix expression.

OR

What is Dequeue? Explain in detail.

Q.4. What is Heap? Explain.

OR

What is B-tree? Explain.

Q.5. What a is header link list? Explain.

OR

What do you mean by adjaceney matrix? Explain in detail.





Q.6. What is optimization problem? Explain.

OR

What are the applications of dynamic programming.

## Section - C

### Long Answer Type Questions

$5 \times 9 = 45$

Q.7. What is array? Explain binary search operation of array with example also write the algorithm for binary search.

OR

Explain following terms?

a) Simulating pointers

b) Indirect Addressing

c) Linear list

Q.8. What is stacks? Explain PUSH and POP operation of stack also write the algorithm for PUSH and POP operation.

OR

What is Queue? Explain linked Representation of Queue also. Explain insertion operation of Queue.

Q.9. What is Binary search Tree? Explain insertion operation of Binary search Tree, also write algorithm for it.

OR

Explain following terms

a) Priority Queue

b) The ADT winner Tree

c) Machine scheduling

Q.10. What is Graph? Explain in detail, also write the Applications of Graph.

OR

What is linked list? Explain searching operation in linked list, also write the algorithm for searching in a linked list.

Q.11. Explain selection sort with example.

OR

Explain merge sort with example.

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