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Voc(Sem-V) —  
BCA (11)

Sem - V

2021

Time : 3 hours

Full Marks : 50

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Answer from **all** the Sections as directed.*

### Section – A

1. Choose the correct answer from the given alternatives : 1×5 = 5

(a) Which one of the following is an application of Stack Data Structure ?

- (i) Managing function calls
- (ii) Stock span problem
- (iii) Arithmetic expression evaluation
- (iv) None of these

(b) Which of the following sorting algorithms can be used to sort a random linked list with minimum time complexity ?

- (i) Insertion sort      ~~(ii) Quick sort~~  
(iii) Heap sort      (iv) Merge sort

(c) What will be the value of top, if the size of stack STACK\_SIZE is 5 ?

- (i) 5      (ii) 6  
~~(iii) 4~~      (iv) 3

(d) Which of the following data structure store the homogeneous data elements ?

- ~~(i) Array~~      (ii) Records  
(iii) Pointers      (iv) None of these

(e) Which of the following case does not exist in complexity theory ?

- (i) Worst Case      (ii) Average Case  
(iii) Best Case      ~~(iv) Null Case~~

2. Fill in the blanks of the following:  $1 \times 5 = 5$

(a) Each node in a linked list has two pairs of data and pointer.

(b) A binary search tree whose left subtree and right sub tree differ in height by at most 1 unit is called AVL Tree.



- (c) When new data are to be inserted into a data structure, but there is not available space; this situation is usually called full / overflow.
- (d) In Linear search, search start at the beginning of the list and check every element in the list.
- (e) Two main measures for the efficiency of an algorithm are \_\_\_\_\_ and \_\_\_\_\_.

### Group – B

Answer any **four** questions of the following:

$$3 \times 4 = 12$$

3. Write infix equivalent of the prefix expression:  $+ - * ^ A B C D // EF + GH$  and convert the obtained infix expression to postfix expression.

4. How are the elements of a 2D array are stored in the memory ?

5. What are the advantages of Linked List over an array ?

6. Distinguish between Linear search and Binary search.

7. How the doubly linked list can be represented ?

8. Write a function to delete first node of circular linked list.

BX – 9/2

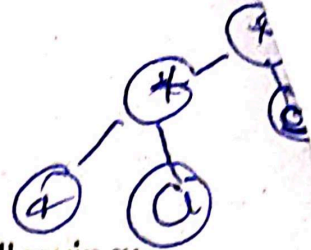
(3)

(Turn over) →

dynamically

dymalic

## Goup - C



Answer any **four** questions of the following:

$$7 \times 4 = 28$$

9. Construct an expression tree for the expression  $(-b^2 + \sqrt{b^2 - 4ac})/2a$ .

10. What are the various types of tree traversal?

Write an algorithm to perform preorder traversal in a tree.

R L Right - Pre

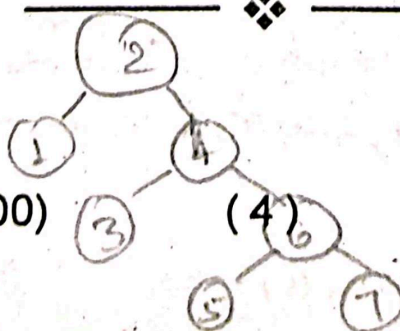
11. Write an algorithm to perform quick sort.

12. Describe various applications of different types of data structures.

13. Write a C program to perform enqueue and dequeue operations in a queue using linked list. Also include the function to display the queue.

14. What is an AVL tree? Insert the following integers in an initially empty AVL tree of integers:

1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 5.



BX - 9/2 (500)

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W9  
Aac