BACHELOR OF COMPUTER APPLICATION
SECOND SEMESTER
DATA STRUCTURE THROUGH C
BCA – 201
(Use Separate Answer Scripts for Objective & Descriptive)

Duration:3 hrs.   Full Marks:70

(**PART-A: Objective**)

Time: 20 min.   Marks:20

Choose the correct answer from the following: ***1X20=20***

1. How can we describe an array in the best possible way?
   a. The Array shows a hierarchical structure.
   b. Arrays are immutable
   c. Container that stores the elements of similar types
   d. The Array is not a data structure

2. Faster access to non-local variables is achieved using an array of pointers to an activation record called a
   a. heap   b. activation tree
   c. display   d. stack

3. Among the following which is not a primitive data type?
   a. Int   b. Float
   c. Char   d. Structure

4. The best data structure to check whether an arithmetic expression has balanced parenthesis is a
   a. queue   b. stack
   c. tree   d. list

5. A postfix expression is merely the reverse of the prefix expression
   a. true   b. false
   c. Cannot say   d. sometimes

6. In a stack, the data item placed on the stack first is
   a. the first data item to be removed   b. the last data item to be removed
   c. given an index of zero   d. not given as index number

7. The postfix equivalent of the prefix *+ab-cd is
   a. ab+cd -*   b. abcd + - *
   c. ab +cd * -   d. ab + - cd*

8. Which one of the following is the size of intarr[9] assuming that int is of 4 bytes?
   a. 9   b. 36
   c. 35   d. 13

9. Insert operation on the queue has to be done after testing
   a. overflow   b. Memory space
   c. underflow   d. No need to test anything

10. The address field of the linked list
    a. Contains the address of the next node
    b. Contain address of next pointer
    c. It May contain NULL character
    d. Both a) and c)

11. Visiting root node after visiting left and right sub-tree is called
    a. In-order traversal
    b. Pre-order traversal
    c. Post-order traversal
    d. None of the above

12. Which of the following is false about Binary Search tree?
    a. The left child is always lesser than its parents
    b. The right child is always greater than its parents
    c. The left and right sub tree should also be binary search tree
    d. None of the above

13. How many children does a binary tree have?
    a. 2
    b. Any number of children
    c. 0 or 1 or 2
    d. 0 or 1

14. In _____ type of search the list should be on sorted order.
    a. Sequential search
    b. Binary search
    c. Both A and B
    d. None of the above

15. The given array is arr = {1, 2, 4, 3}. Bubble sort is used to sort the array elements. How many iterations will be done to sort the array?
    a. 3
    b. 2
    c. 4
    d. None of the above

16. Which of the following algorithm does not divide the list
    a. Linear search
    b. Binary search
    c. Merge sort
    d. Quick sort

17. Which of the following algorithm design technique is used in the quick sort algorithm?
    a. Dynamic programming
    b. Backtracking
    c. Divide-and-conquer
    d. None of the above

18. The spanning tree of connected graph with 10 vertices contains .

    a. 9 edges
    b. 11 edges
    c. 10 edges
    d. None of the above

19. A graph is a collection of nodes called _____ and line segments called arcs or _____ that connects pair of nodes.
    a. Vertices, Edges
    b. Edges, Vertices
    c. Vertices, Paths
    d. None of the above

20. The number of elements in the adjacency matrix of a graph having 7 vertices is

    _____

    a. 4
    b. 14
    c. 36
    d. 49

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Time : 2 hrs. 40 min.   Marks : 5(

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

1. What do you mean by Asymptotic Analysis? Write down the formal   5+5=10
    definition of Big-O ,BigΩ, and Big Θ notation.

2. Convert the following expression to postfix expression using stack   10
        A-B+(M^N)*(O+P)-Q/R^S*T+Z

3. Evaluate the following expressions: 2×5=10
        a.   Evaluate postfix expression
             a+b*c-d/e^f, a=2, b=3, c=4,d=16,e=2,f=3

        b.   Find the value of the given expression
                5 3+ 6 2 / X 3 5 X +

        c.   Convert postfix to infix ab+ef/*

        d.   Construct a Binary Tree from the following preorder and
             Inorder Traversal
             Preorder: 1,2,4,8,9,10,11,5,3,6,7
             Inorder:8,4,10,9,11,2,5,1,6,3,7

4. Explain the types of basic searching techniques with example   10

5. Write a 'C' program to arrange the numbers in ascending order using   10
    Selection Sort technique.

6. Define Tree, Complete Binary Tree, Binary Search Tree, Skewed Binary   8+2=10
    Tree with diagram. What are the advantage of a tree in data structure?

7. What is spanning tree? Explain spanning tree with an example. Define   2+4+4
    undirected, directed ?   =10

8. Explain the following: 5+5=10
        a.   Quick sort
        b.   Kruskal's algorithm

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