REV-01
BCA/01/05

2023 06

SET A

BACHELOR OF COMPUTER APPLICATION
SECOND SEMESTER (REPEAT)
DATA STRUCTURE THROUGH C
BCA-201
[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs. Full Marks: 70

Objective

Time: 30 mins. Marks: 20

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

1. 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

2. The best data structure to check whether an arithmetic expression has balanced parenthesis is a:
   a. Queue b. Stack
   c. Tree d. List

3. 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

4. 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

5. 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

6. 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

7. 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

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

9. The spanning tree of connected graph with 10 vertices contains:
   a. 9 edges b. 11 edges
   c. 10 edges d. None of the above

10. The number of elements in the adjacency matrix of a graph having 7 vertices is:
    a. 4
    b. 14
    c. 36
    d. 49

11. 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

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

13. A postfix expression is merely the reverse of the prefix expression:
    a. True
    b. False
    c. Cannot say
    d. Sometimes

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

15. Insert operation on the queue has to be done after testing:
    a. Overflow
    b. Memory space
    c. Underflow
    d. No need to test anything

16. 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

17. 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

18. 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

19. 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

20. 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

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Descriptive

Time : 2 hr. 30 mins. Marks : 50

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

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

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

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

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

5. Discuss Depth First Search and Breadth First Search of a graph. 5+5=10

6. Convert the following infix expression to Prefix: 5+5=10
   i) a - b / (c + d * e)
   ii) ((a + b) * c - (d - e)) / (f+g)

7. Explain double ended queue with all their functions. 10

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

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