

**Dr. Babasaheb Ambedkar Open University**  
**Term End Examination July – 2021**

<b>Course</b>	<b>: BCAR/DCAR</b>	<b>Date</b>	<b>: 27-July-2021</b>
<b>Subject Code</b>	<b>: BCAR/DCAR-201</b>	<b>Time</b>	<b>: 01:00pm to 03:00pm</b>
<b>Subject Name</b>	<b>: Data Structure Using C</b>	<b>Duration</b>	<b>: 02 Hours</b>
		<b>Max. Marks</b>	<b>: 50</b>

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**Section A**

**Answer the following (Attempt any two)** **(20)**

1. What is doubly linked list? Write a C program to create doubly linked list and insert a new element in doubly linked list.
2. What is hashing and give advantages of hashing? Explain linear hashing in detail with suitable example.
3. What is a binary search tree? Create a binary search tree for the following data. 14, 10, 17, 12, 10, 11, 20, 12, 18, 25, 20, 8, 22, 11, 23 Explain deleting node 20 in the resultant binary search tree.
4. Explain static and dynamic representation of Queue with suitable example. Write a C program to insert and delete element in Queue using linked list.

**Section B**

**Answer the following (Attempt any three)** **(15)**

1. Explain delete operation to delete a node from binary tree with suitable example.
2. Explain different representation of a Graph with suitable example.
3. Write an algorithm for Depth First Search of a Graph and discuss with suitable example.
4. Explain two search techniques and also analyze the complexity of these techniques.
5. Explain internal and external sorting techniques. Also give the difference between internal and external sorting techniques.

**Section C**

**Part – A (Multiple Choice Questions)** **(10)**

- 1 In linked list, we do not need extra pointer variable to keep track of previous node in the *delnode ()* function.
 

A Singly	B Circular
C Doubly	D All of above
- 2 Which of the following given below is not a stack application.
 

A Recursion	B Infix to Postfix
C Reverse of the String	D Finding shortest path
- 3 What is the postfix expression for the infix expression  $a+(b*c(d/e^f)*g)*h$ .
 

A $abcdef^/*g*h*+$	B $ab*cdef/^*g-h+$
C $abcd*^ed/g*-h*+$	D $abc*de^fg/*-*h+$

- 4 Which one of the following is an application of Queue Data Structure?
- A When a resource is shared among multiple consumers.      B When data is transferred asynchronously (data not necessarily received at same rate as sent) between two processes
- C Load Balancing      D All of Above
- 5 A binary search tree contains values 7, 8, 13, 26, 35, 40, 70, 75. Which one of the following is a valid post-order sequence of the tree provided the pre-order sequence as 35, 13, 7, 8, 26, 70, 40 and 75?
- A 7, 8, 26, 13, 75, 40, 70, 35      B 8, 7, 26, 13, 40, 75, 70, 35
- C 7, 8, 13, 26, 35, 40, 70, 75      D 26, 13, 7, 8, 70, 75, 40, 35
- 6 The complexity of Bubble Sort Algorithm is \_\_\_\_\_
- A  $O(n)$       B  $O(n \log n)$
- C  $O(n^2)$       D  $O(\log n)$
- 7 Which of the following searching methods requires that all keys must reside in internal memory?
- A Binary Search      B Sequential Search
- C Hashing      D Depth First Search
- 8 Prim's Algorithm is based on \_\_\_\_\_ method
- A Divide and Conquer Method      B Dynamic Programming
- C Greedy Method      D Branch and bound
- 9 Application of Mergesort
- A Graphic card      B Networking
- C Card Sorting      D Data Processing
- 10 For the following question, how will the array elements look like after second pass in Selection sort algorithm? 34, 8, 64, 51, 32, 21
- A 8, 21, 64, 51, 32, 34      B 8, 32, 34, 51, 64, 21
- C 8, 21, 32, 34, 51, 64      D 8, 34, 64, 51, 32, 21

**Part – B (Do as Directed)**

**(05)**

- 1 What is non-linear data structure?
- 2 Minimum number of spanning tree in a connected graph is \_\_\_\_\_
- 3 Suppose marks[3][3] = {50,60,70,55,65,75,44,66,77} is a 2D array then calculate the memory address of the element 55 in column major order representation if base address is 500.
- 4 What is significance of *malloc()* function ?
- 5 For an undirected graph with  $n$  vertices and  $e$  edges, the sum of degree of each vertex is equal to \_\_\_\_\_

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