UOM Exam Second half 2021_Question paper_R2019/CSC303 - Data Structure /Sem-III / COMPUTER ENGINEERING / ARTIFICIAL INTELLIGENCE AND DATA SCIENCE / ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING / COMPUTER SCIENCE AND ENGINEERING (Artificial Intelligence and Machine Learning / COMPUTER SCIENCE AND ENGINEERING (Data Science) / COMPUTER SCIENCE AND ENGINEERING (Internet of Things and Cyber Security Including Block Chain Technology) / CYBER SECURITY / DATA ENGINEERING / INTERNET OF THINGS (IoT)

Dear Student,
Please note before you attempt this section of examination:
1. Q1, Q2, Q3 and Q4 carry 20 marks each.
2. This paper contains 20 Marks MCQ and 60 marks subjective section for 150 minutes duration.
3. It is mandatory for all the students to upload their answer papers in a single PDF format only.
4. You have to write Date of Examination, Seat number, Program, Scheme and semester, Subject name, Signature on EVERY PAGE.
5. Remain in the meet with your camera on and you in clear view throughout the duration of the exam.

* Required

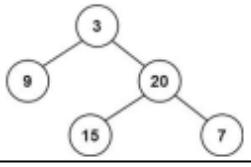
1. Email *

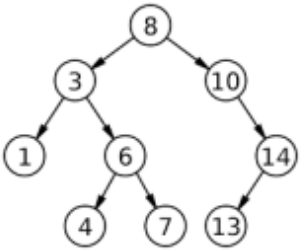
2. Student Name (As per exam form filled) *

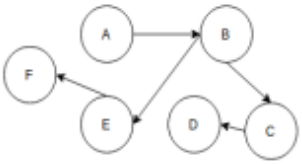
3. Seat No *
Refer Hall ticket

Solve Questions as per the instructions given separately.

- Please upload a single PDF for Q1 to Q4
- For MCQs Question write Question number & correct option with complete text in option.
- Q2 to Q4 are subjective questions - Solve Questions as per the instructions and marks allotted.

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Balanced factor of root node after inserting the element 19 in the given AVL tree will become - 
Option A:	-1
Option B:	1
Option C:	2
Option D:	-2
2.	Which of the following condition can hold true, if a circular queue implemented using an array of size MAX, overflows ?
Option A:	front=rear+1
Option B:	rear=front
Option C:	front=(rear+1)%MAX
Option D:	rear=MAX-1
3.	Which among the following is not a linear data structure?
Option A:	Two Dimensional Array
Option B:	Double Ended Queue
Option C:	Binary Search Tree
Option D:	Doubly Linked List
4.	Consider a stack containing following elements 9 3 7 2 << top, where the top element is 2. You need to get the following stack 9 3 5 7 << top. The operations that needed to be performed are (You can perform only push and pop):
Option A:	pop(), push(5)
Option B:	pop(), pop(), push(5), push(7)
Option C:	pop(), pop(), push(5), pop(), push(7)
Option D:	push(5), push(7)

5.	Which of the following is not a collision resolution method?
Option A:	Separate chaining
Option B:	Linear search
Option C:	Linear probing
Option D:	Double hashing
6.	The post order traversal for the below given binary search tree, after deleting the nodes 6 and 13 is - 
Option A:	1,3,4,7,8,10,14
Option B:	1,4,7,3,8,10,14
Option C:	1,4,7,3,10,14,8
Option D:	1,4,7,3,14,10,8
7.	Which type of linked list begins with a pointer to the first node and each node contains a pointer to the next node, and the pointer in the last node points back to the first node?
Option A:	Singly linked list
Option B:	Doubly linked list
Option C:	Circular singly linked list
Option D:	Circular doubly linked list

8.	After inserting the elements 60, 30, 14, 78, 72, 89 in sequence in a B-tree of order-3, what will be the root node?
Option A:	60,72
Option B:	30,78
Option C:	60,78
Option D:	30,72
9.	The Data structure used in the standard implementation of Breadth First Search is?
Option A:	Tree
Option B:	Linked List
Option C:	Queue
Option D:	Stack
10.	What will be the topological ordering for the below graph. 
Option A:	A B C D E F
Option B:	A B E F C D
Option C:	A B E C F D
Option D:	A B C D F E

Q2	Solve any Four out of Six 5 marks each
A	What is a non-linear data structure? Explain with example.
B	Explain Queue ADT.
C	Write a function to find and display the sum and average of elements in a singly linked list.
D	Explain different cases of deletion of a node in binary search tree with an example.
E	Explain in brief Double Ended Queue.
F	Consider a hash table of size 11 that uses quadratic probing to resolve collisions. Insert the keys : 12,19,23,30,34,45,59,61 in sequence in the hash table. Draw the table after inserting in the given order and also find the total number of collisions.

Q3	Solve any Two Questions out of Three 10 marks each
A	Write a program in C to check for balanced parentheses using stack. Simulate with an example,
B	Write the function for BFS traversal of a graph ADT. Show with a directed graph the BFS traversal.
C	Create AVL tree by inserting the given values in sequence: 45,8, 33, 85, 61, 10, 48, 76, 57,99

Q4	Solve any Two Questions out of Three 10 marks each
A	Write a program to create a singly linked list containing following functions: a) Insert at end b) Display c) Count odd and even elements in the list.
B	Create B tree of order 3 by inserting the given values in sequence: 56, 9, 567, 66, 234, 89, 12, 45, 789, 74.
C	Write a program to implement circular queue using linked list.

4. Please Upload complete scanned answer copy in a single PDF file. *

   Files submitted:

5. Have you uploaded correct scanned copy of the answer sheets. *

   Mark only one oval.

   ◯ YES