MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

III SEMESTER B. TECH (COMPUTER SCIENCE & ENGINEERING)
IN SEMESTER EXAMINATION, DECEMBER 2021
SUBJECT: DATA STRUCTURES & APPLICATIONS (CSE 2152)
REVISED CREDIT SYSTEM

Date of Exam: 14/12/2021 **Time: 80 + 10 Minutes** **MAX. MARKS: 20**

Note: Answer ALL the questions.
SET-2

1	Given the following declarations:
	int num[10] = {23, 5, 7, 4, -1, 6, 12, 10, 3, -23};
	int k = 2;
	int h = 4;
	Write the values of the following expressions.
	a) *(num + 2)
	b) *(num + k + h)
	c) *(num + 1) + *(num + h)
	d) *(num + h)
	e) *num + *(num + h)
	f) *(num + k) * *(num + h)
		3

2	Create a type STUDENT which is used to represent a student structure with reg_no, name and cgpa. Write a complete program to dynamically allocate memory for N such students, where N is read from keyboard and to read and display information for each student.	3
3	Consider a **Circular Deque** implemented using a fixed array of size 5. Show the status of the queue using the table below for each of the following operations. Show appropriate messages whenever required. . [Table shows entries for the first 2 operations] i. Begin ii. InsertF 5 iii. InsertR 10 iv. InsertF 3 v. InsertF 2 vi. DeleteR vii. DeleteR viii. DeleteR ix. InsertF 5 x. InsertR 1 xi. InsertR 0 xii. DeleteF xiii. DeleteF xiv. DeleteF xv. DeleteF xvi. DeleteF	4

	<table><tr><th>S.No</th><th>Operation</th><th>Element Inserted/Deleted/ Message</th><th>Front</th><th>Rear</th><th>Array</th></tr><tr><td>1</td><td>Begin</td><td></td><td>-1</td><td>-1</td><td>0 1 2 3 4 [ ] [ ] [ ] [ ] [ ]</td></tr><tr><td>2</td><td>InsertF</td><td>5</td><td>0</td><td>0</td><td>0 1 2 3 4 [5] [ ] [ ] [ ] [ ]</td></tr></table>	

4	Write a function ***struct node * insert_order (struct node *first, int reg_no)*** which inserts a new node into a circular singly linked list without header node(list may be initially empty) in the ascending order of the registration number and returns the new list. The node structure of the linked list is as given below:
	struct node {
	int registration;
	struct node* next;
	};
		3

5	Given a circular singly linked list without header node consisting of nodes in the ascending order of registration number, write a function ***void Remove_Duplicates(struct node *first)*** which deletes the nodes with duplicate registration numbers, retaining the first occurrence in the list.
	The node structure of the linked list is as given below:
	
	struct node {
	int registration;
	struct node* next;
	};
		3

6	Given two **Doubly Linked Lists with header node** representing long binary numbers, write a function **Add (),** to add the two binary numbers and return a **Doubly Linked List with header node** representing the sum. The prototype of the Add function is as follows: **Nodeptr Add(Nodeptr A, Nodeptr B);**	4