# **Question Paper**

Exam Date & Time: 31-May-2022 (09:30 AM - 12:30 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

### INTERNATIONAL CENTRE FOR APPLIED SCIENCES II SEMESTER B.Sc.(Applied Sciences) in Engg. END SEMESTER THEORY EXAMINATION- MAY/JUNE-2022

#### Data Structure [ICS 121]

Duration: 180 mins.

Marks: 50

#### Answer all the questions.

#### Missing data may be suitably assumed

1)	A)	Define an enumerated datatype RETURN_STATUS { NOT_FOUND,FOUND}. Use this datatype in the recursive binary search function. [ Hint: if the element is found, return FOUND and NOT_FOUND in case of the element is not found. Check these values in the main to display the appropriate result.]	(7)
	B)	Write a C program to display the content of an array with the help of a pointer.	(3)
2)	A)	Trace the algorithm of infix expression to postfix expression for the following infix expression: [no need to write the algorithm] A + (B / C - (D / E * F) / G)* H	(6)
	B)	Write insert() and delete() functions for Circular Queue. [Assume that other required functions are already defined.]	(4)
3)	A)	Write a complete C program to find the sum of even digits of a given number using a dynamic stack.	(8)
	B)	Differentiate between structure and union in terms of memory allotment of the data members.	(2)
4)	A)	Given two doubly LinkedLists A and B, representing 2 sorted lists, write a mergeList() function to create a new linked list C, by merging these two lists so that the resultant list should be a sorted list. [The function accepts two arguments: LinkedList A & B and returns the sorted list. Only mergeList() should be defined, other required functions to be considered to be already defined.]	(5)
	B)	Define a single LinkedList node with member data: roll_no. Also, define insertFirst() and insertLast() functions to create the list. [Need not to	(5)