Question Paper

Exam Date & Time: 07-Jul-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 - S2]

Duration: 180 mins.

Marks: 50

Answer all the questions.

Missing data, if any, may be suitably assumed

1)	A)	Create a header file with recursive Print () function, name the file appropriately. Add the header file in your source code which contains main (). Call Print () in main () and print N natural numbers from 1 to N. {Write necessary comments.}	(6)
	B)	Write a C program to demonstrate the difference between structure and union variables, in terms of memory size.	(4)
2)	•	Evaluate the following postfix expression using manual steps using Stack: 7 3 2 ^ + 4 - 3 / 5 *	(5)
	A)	Note: above expression contains digits 1 to 9 as operands and ^ exponent, * multiplication, / division, + addition, - subtraction	
	B)	Define doubly LinkedList node with data member : roll_no. Also define insertFirst() and insertLast() functions to create the list. [No need to define other functions only functions to be defined are: insertFirst() and insertLast().]	(5)
3)	A)	Define calloc() and realloc() dynamic functions with the help of prototype and example code.	(6)
	B)	Write insert() function for Priority Queue. [Assume that all necessary functions have been defined.]	(4)
4)	A)	Using single LinkedList, write an addPolynomial() function to add two polynomials. The function accepts two polynomials and returns the resultant polynomial. [Assume that all necessary functions have been defined.]	(6)
	B)	Define push() functions for multiple stack. [Assume that all necessary	(4)

functions have been defined.]

⁵⁾ Given a list of numbers 25, 9, 6, 1, 60, 12, 77, 59, 19, 20, 17. Show each ⁽¹⁰⁾ phase of creating a Binary search tree using them, starting from 25. Describe all three cases of deletion from the binary search tree taking the resultant binary search tree into consideration.

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