CBCS SCHEME

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BEC405D

Fourth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025
Data Structures Using C

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

			M	L	C
		Module – 1			
Q.1	a.	Differentiate between Structures and Unions.	5	L2	CO1
	b.	Develop a C function to arrange numbers in ascending order using bubble sort.	8	L2	CO1
	c.	What is Pointer? How pointers can be declared and initialized.	7	L1	CO1
		OR			
Q.2	a.	Define Data Structures. Discuss its classification.	6	L1	CO1
	b.	Develop a 'C' program to insert an element at a given position.	8	L2	CO1
	c.	With an example , explain dynamic memory allocation supported by 'C'.	6	L2	CO1
		Module – 2			
Q.3	a.	Discuss the different operation that can be performed on stack.	6	L2	CO2
	b.	Write an algorithm for evaluation of postfix expression.	7	L2	CO2
	c.	Define Recursion. Develop a 'C' program toe find factorial of 'n' using recursive function.	7	L3	CO2
		OR			
Q.4	a.	Define Stack. List the applications of stack.	5	L1	CO2
	b.	State the problem of tower of Hanoi. Write the function to solve tower of Hanoi problem.	8	L3	CO2
	c.	Construct an algorithm to convert infix to postfix expression.	7	L2	CO2
		Module – 3			
Q.5	a.	Define Queue. List the application of queue.	6	L1	CO3
	b.	List the difference between singly linked list and array.	6	L2	CO2
	c.	Develop function how an element can be inserted at front end and rear end in DLL (Doubly Linked List).	8	L2	CO3
		OR			

Q.6	a.	Develop a 'C' program to implement all the functions defined in the abstract data types of queue.	7	L2	CO3
	b.	Construct a function to implement delete a node from rear end using SLL (Singly Linked List).	7	L2	CO3
	c.	What is CLL? Build a function to insert an item at the front end of C.L.L.	6	L2	CO3
Module – 4					
Q.7	a.	Define Binary tree. Construct binary tree from the input 14, 15, 4, 9, 7, 18, 3, 5, 16, 4, 20, 17, 9, 14, 5.	6	L3	CO4
	b.	Discuss inorder , preorder , postorder , traversal with an example.	9	L2	CO4
	c.	Write a 'C' function to evaluate an expression using expression tree.	5	L2	CO4
OR					
Q.8	a.	With suitable example, define the following terms : i) Degree of a node ii) Level of binary tree iii) Complete binary tree iv) Full binary tree.	8	L2	CO4
	b.	Construct binary tree for expression A + (B + C) * D/(E*F).	5	L3	CO4
	c.	Develop a function, how to insert a note into binary search tree.	7	L3	CO4
Module – 5					
Q.9	a.	With respect to the representation of graph , explain below : i) Adjancy matrix ii) Adjancy list.	5	L2	CO4
	b.	Develop a 'C' program to implement the Kruskal's algorithm to find the minimum spanning tree.	8	L3	CO4
	c.	Define Hashing. Briefly discuss the various types of Hashing.	7	L2	CO5
OR					
Q.10	a.	What is Graph data structure? Explain the components of graph.	6	L2	CO5
	b.	Describe the advantages of hashing in data structure and mention the application of hashing.	6	L2	CO4
	c.	How does the prim's algorithm works? Develop a function to implement prims algorithm to find minimum spanning tree.	8	L2	CO5

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