R22

Code No: R22A0503

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Supplementary Examinations, June 2025

Data Structures

(CSE, IT, CS&IT, CSE-CS, CSE-AIML, CSE-DS, CSE-IOT & B.Tech-AIML)

Roll No										

Time: 3 hours **Max. Marks: 60**

Note: This question paper contains two parts A and B
Part A is compulsory which carries 10 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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		PART-A (10 Marks)	**BCLL**	**CO(s)**	**Marks**
		(Write all answers of this part at one place)			
1	A	What is inheritance and list the types?	**L1**	**CO-I**	**[1M]**
	B	What is abstraction in OOPs with example?	**L2**	**CO-I**	**[1M]**
	C	Where do we use the sorting in real time applications?	**L4**	**CO-II**	**[1M]**
	D	In which scenario quick gives best performance.	**5**	**CO-II**	**[1M]**
	E	List the applications of stack?	**L2**	**CO-III**	**[1M]**
	F	Why do we need data structures?	**L1**	**CO-III**	**[1M]**
	G	List the applications of skip list.	**L3**	**CO-IV**	**[1M]**
	H	What data structures are used in BFS and DFS	**L4**	**CO-IV**	**[1M]**
	I	What is importance of B tree?	**L2**	**CO-V**	**[1M]**
	J	How to do the LL and LR rotation of the AVL tree	**L3**	**CO-V**	**[1M]**
		PART-B (50 Marks)			
		SECTION-I			
2		What is polymorphism? Explain different types with examples.	**L2**	**CO-I**	**[10M]**
		OR			
3	A	What is the need for OOPs?	**L2**	**CO-I**	**[5M]**
	B	What is parameterized constructor? Explain with an example.	**L3**	**CO-I**	**[5M]**
		SECTION-II			
4	A	Explain the bubble sorting algorithm with example?	**L6**	**CO-II**	**[5M]**
	B	Write the binary search algorithm for the given unsorted numbers.	**L2**	**CO-II**	**[5M]**
		OR			
5	A	Write a function to sort the elements using quicksort	**L2**	**CO-II**	**[5M]**
	B	Compare the binary search and linear search.	**L3**	**CO-II**	**[5M]**
		SECTION-III			
6	A	Write the functional code for deleting a desired node in a singly linked list	**L4**	**CO-III**	**[5M]**
	B	Explain the priority queue with an example.	**L2**	**CO-III**	**[5M]**

OR

7	A	Give a method for removing all the elements from a stack	**L3**	**CO-III**	**[5M]**
	B	Describe in detail an algorithm for reversing a singly linked list L using only a constant amount of additional space and not using any recursion.	**L5**	**CO-III**	**[5M]**

SECTION-IV

8	A	Discuss the dictionary with different operations.	**L2**	**CO-IV**	**[5M]**
	B	How do you insert a skip list? Explain with an example.	**L3**	**CO-IV**	**[5M]**

OR

9	A	Write a Python program to get the maximum and minimum values of a dictionary.	**L3**	**CO-IV**	**[5M]**
	B	Write a function to search the elements in a skip list.	**L4**	**CO-IV**	**[5M]**

SECTION-V

10		Construct binary tree from the following orders: Inorder: 20,30,35,40,45,50,55,60,70. Postorder: 20,35,30,45,40,55,70,60,50.	**L4**	**CO-V**	**[10M]**

OR

11	A	Create binary search tree for the following elements (23, 12, 45, 36, 5, 15, 39, 2, 19). Discuss about the height of the above binary search tree.	**L4**	**CO-V**	**[5M]**
	B	Insert the elements into a B-Tree of first 15 prime numbers , node contains 3 pointers.	**L3**	**CO-V**	**[5M]**

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