15-05-2026 FE SEM-II IT/CSE-AIML/CS-CYBER (NEP-2020) DS QP CODE: 20011580

Duration: 2 hrs **[Max Marks:60]**

N.B. : (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

1		**Attempt any THREE**	**[15]**
	a	Define Data Structure. List the types of Data Structure.	**[5]**
	b	What is a Tree? Explain its terminology (root, leaf, height, degree).	**[5]**
	c	List the applications of the queue.	**[5]**
	d	Differentiate between array and Linked List.	**[5]**
2	**a**	Convert the following infix expression to a postfix expression. A + B * (C - D) / E	**[8]**
	b	Write an algorithm to implement operations on Stack. (Push(), Pop(), Display())	**[7]**
3	**a**	What is a Linked List? Write an algorithm to delete a node from a Singly Linked List.	**[8]**
	b	List and explain the operations on data structures.	**[7]**
4	**a**	List the tree traversal methods. Write the algorithm for preorder, inorder and postorder tree traversal.	**[8]**
	b	Design a Huffman tree for the word “MAHARASHTRA”. Also write the Huffman code to represent each symbol.	**[7]**
5	**a**	What is a Binary Search Tree? Design a Binary Search Tree for the following elements: 40, 70, 80, 90, 20, 30, 50, 60	**[8]**
	b	Write an algorithm to implement stack using Linked List.	**[7]**
6	**a**	List the applications of Stack. Explain any one application with a suitable example.	**[8]**
	b	Write an algorithm to reverse a Singly Linked List.	**[7]**

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