BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION MO/SP20)**

CLASS: IMSC **SEMESTER : III**
BRANCH: MATHS & COMP. **SESSION : MO/2022**

SUBJECT: CS201 DATA STRUCTURES

TIME: 03 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. **The question paper contains 5 questions each of 10 marks and total 50 marks.**
2. **Attempt all questions.**
3. **The missing data, if any, may be assumed suitably.**
4. **Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

Q.1(a)	How can two dimensional arrays have represented in the main memory?	[2] CO1, BL1
Q.1(b)	Write an algorithm/pseudocode/ procedure to transpose of a mxn matrix.	[3] CO1,BL2
Q.1(c)	Explain the role of Asymptotic Notations with examples in the Data Structures and Algorithms.	[5] CO1,BL3
Q.2(a)	What is Priority Queue. Give its applications.	[2] CO2,BL1
Q.2(b)	Explain how STACKs are used in a non-recursive program,	[3] CO2,BL2
Q.2(c)	Write am algorithm/pseudocode/procedure to create a QUEUE which permits insertion at both the ends.	[5] CO2,BL3
Q.3(a)	Specify the use of a header node in a header linked list.	[2] CO3,BL1
Q.3(b)	Write an algorithm to count the number of blank/ without values nodes in a CQ.	[3] CO3,BL2
Q.3(c)	Write an algorithm/pseudocode/procedure to count the number of occurrences of a given value in a linked list.	[5] CO3,BL3
Q.4(a)	Give an example of a TREE whose pre order and post order traversal is same.	[2] CO4,BL1
Q.4(b)	Construct a BST for the data< 34,23,11,56,36,54,39,19,5,76,41,26,83,62,4,9,10,19>. Examine this a height balanced tress or not.	[3] CO4,BL2
Q.4(c)	Write an algorithm/pseudocode/procedure In Order Traversal and explain with example.	[5] CO4,BL3
Q.5(a)	A certain sorting technique was applied to the following data set, 45,1,27,36,54,90 After two passes, the arrangement of the data set is given as below: 1,27,45,36,54,90 Identify the sorting algorithm that was applied.	[2] CO5,BL1
Q.5(b)	Which sorting is good and why? Justify with examples.	[3] CO5,BL2
Q.5(c)	Write an algorithm for Insertion sort and explain with an example.	[5] CO5,BL3

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