BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION MO-2022)

CLASS: B. TECH   SEMESTER: V
BRANCH: ECE/EEE/BT/CP&P/ME/PIE   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

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Q.1(a)	Distinguish between time and space complexity?	[CO-4, PO-1, BT-2]	[2]
Q.1(b)	Explain sparse matrix?	[CO-1, CO-5, PO-2, BT-3]	[3]
Q.1(c)	Discuss the best case, worst case and average case time complexity of an algorithm with a suitable example?	[CO-2, PO-2, BT-4]	[5]

Q.2(a)	Differentiate between stack and queue?	[CO-1, CO-2, PO-2, BT-2]	[2]
Q.2(b)	Given an array *A [ ]* of size N, write an algorithm to reverse the array using stack?	[CO-2, CO-3, PO-3, BT-3]	[3]
Q.2(c)	Discuss the Mazing problem?	[CO-3, PO-3, BT-3]	[5]

Q.3(a)	Give the advantages of a circular linked list?	[CO-3, PO-3, BT-3]	[2]
Q.3(b)	Write an algorithm to delete the last node from a singly linked list?	[CO-2, CO-3, PO-4, BT-4]	[3]
Q.3(c)	Discuss why is a doubly linked list more useful than a singly linked list?	[CO-2, PO-3, BT-3]	[5]

Q.4(a)	How does the height of a binary search tree effect its performance?	[CO-1, CO-4, PO-4, BT-4]	[2]
Q.4(b)	Explain depth first search traversal method of a graph?	[CO-5, PO-4, BT-3]	[3]
Q.4(c)	Construct a binary tree from the given in-order and pre-order traversal: in-order traversal: {Q, B, K, C, F, A, G, P, E, D, H, R} pre-order traversal: {G, B, Q, A, C, K, F, P, D, E, R, H}	[CO-3, PO-4, BT-4]	[5]

Q.5(a)	What is the difference between internal sorting and external sorting?	[CO-4, PO-1, BT-3]	[2]
Q.5(b)	Differentiate between sequential search and binary search?	[CO-1, CO-4, PO-3, BT-4]	[3]
Q.5(c)	Construct a heap (H) from the given set of numbers: 33, 42, 67, 23, 44, 49 and 74. Also, while constructing, draw the memory representation of the heap?	[CO-3, CO-4, PO-3, BT-4]	[5]

:::::: 29/11/2022 ::::::M