BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: BTECH
BRANCH: CSE/IT

SEMESTER: III
SESSION: MO/2022

SUBJECT: CS231 DATA STRUCTURES

TIME: 2 HOURS

FULL MARKS: 25

INSTRUCTIONS:
1. The total marks of the questions are 25.
2. Candidates attempt for all 25 marks.
3. Before attempting the question paper, be sure that you have got the correct question paper.
4. The missing data, if any, may be assumed suitably.
5. Tables/Data handbook/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q1 (a)	Let B be a two dimensional array declared as B: array [1...10] [1...15] of integer; Assuming that each integer takes one memory location the array is stored in row major order and the first element of the array is stored at location 100, what is the address of the element B[i][j]?	[2]	[CO1]	2
Q1 (b)	Write a program/procedure/algorithm/pseudocode which deletes all duplicate elements from the array.	[3]	[CO2]	2

Q2 (a)	What is the complexity of the program given below
	`void function(int n) {`
	`int i, j, k ,count=0;`
	`for(i=n/2;i<=n;i++)`
	`for(j=1;j<=n;j=2*j)`
	`for(k=1;k<=n;k=k*2)`
	`count++;`
		[2]	[CO4]	2

Q2 (b)	How is an 1D, 2D and multidimensional array represented in computer memory? Explain Sparse matrix representation with an example.	[3]	[CO2]	1
Q3 (a)	Given a string containing n S's and n X's where S indicates a PUSH operation and X indicates a POP operation, and with the STACK initially empty, formulate a rule to check whether a given string S of operations is admissible or not?	[2]	[CO3]	3
Q3 (b)	Write an algorithm/program/procedure/pseudocode for the conversion of INFIX expressions to POSTFIX expression. Explain through an Example.	[3]	[CO3]	1
Q4 (a)	What is most appropriate data structure to print elements of QUEUE in reverse order. Explain with Diagram.	[2]	[CO4]	3
Q4 (b)	Discuss the Implementation of QUEUE using STACKS. Explain with an Example.	[3]	[CO5]	3
Q5 (a)	If the array representation of a circular queue contains only one element, then write the conditions for this using FRONT and REAR.	[2]	[CO1]	2
Q5 (b)	Write a program/procedure/algorithm/pseudocode to make first element of singly linked list is the last element of the list.	[3]	[CO5]	2

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