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MID TERM EXAMINATION
THIRD SEMESTER [B.TECH] DECEMBER-2022

Paper Code : ARD 211

Subject : Data Structure

Time : 90 mins

Maximum Marks : 30

Note : Attempt any five questions including Q.No 1 which is compulsory.

Q1. Attempt all :-

5X2=10

- A. What is the condition to check overflow and Underflow conditions in a circular queue?
- B. A 2-D array $x[5][4]$ is stored row-wise in the memory. The first element is stored at location 70. Find the memory location of $x[3][2]$. If each element of the array requires 4 byte memory space (Lower limit of row and column can be assumed as Zero).
- C. How will you represent a polynomial $3x^3+2x^2+5x+7$ using a singly linked list?
- D. Differentiate between Mergesort and Quicksort.
- E. What do you understand by complexity of an algorithm? Write worst case and best case complexity of Insertion Sort.

Q2.

2.5+2.5=5

- A. Write an algorithm/Program to implement an input restricted double ended queue using an array.
- B. Trace the steps involved in converting the given infix expression $((A+B)^C)-((D^*C)/F)$ to postfix expression.

Q3.

5

Write the pseudocode to perform the following operations on a doubly linked list.

- (i) Insert a node with data 'a' after a node whose data is 'z'.
- (ii) Delete the second node.
- (iii) Insert a node with data 's' as the 1st node of the linklist.

Q4. Write the algorithm for quick sort and perform the same sorting on the following values

75,12,23,58,11,94,6,8,13

5

Q5.

3+2=5

- A. How can you reverse a string using stack? Give one example and show how you can reverse a given string using stack.
- B. Write an algorithm to evaluate postfix expression. Trace the algorithm on the following input
 $623+-84/+23^+*$ (all numbers are single digits)

Q6.

5

Explain Merge Sort algorithm/pseudocode with the help of an example?
Mention the best case and worst case time complexity of Merge sort algorithm?