Total No. of Questions – [06]

Total No. of Printed Pages: 2

| G.R. No. | |
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# DECEMBER 2021 - ENDSEM EXAM

## S. Y. B. TECH. (AI&DS) (SEMESTER - I)

## COURSE NAME: Data Structure

## COURSE CODE: ADUA21202

## (PATTERN 2020)

Time: [1Hr] [Max. Marks: 30]

**(*) Instructions to candidates:**

1) **Answer Q.1 OR Q.2, Q.3 OR Q.4, Q.5 OR Q.6.**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q.1 a Define is Circular Linked List? List the advantages and disadvantages of Circular Link List Over Doubly Linked List and Singly Linked List. Also write advantages of Linked List over an Array. [4]

Q.1 b Develop a program to create a singly linked list and split it at the middle, and make the second half as the first half and display the final list [6]

**OR**

Q2 a Distinguish between a Singly linked list and Doubly Linked List. [4]

Q2 b Consider a polynomial f(x)=5X^12+3X^6+5. Represent it using the data structure doubly linked list. [6]

Q.3 a Define recursion. List the pros and cons of recursive function. [4]

Q.3 b Design an algorithm pseudocode to convert a given infix expression to postfix expression? Trace the steps involved in converting the given infix expression ((A +B)^C)-((D*C)/F) to postfix expression. [6]

**OR**

Q.4 a Analyze Polish and Reverse polish notation with the help of examples for each? [4]

Q.4 b Discuss array representation of stacks. Construct algorithm for PUSH and POP stack operations and show operations for the elements 36,23,67,89,55. [6]

Q.5 a Distinguish between ordinary queue and circular queue. [4]

Q.5 b Consider a pizza parlor accepting n orders. Orders are processed as FCFS, the order cannot be cancelled once it is placed. Construct an algorithm to simulate the system using circular queue. [6]

**OR**

Q.6 a How multiple queues are implemented using single large array. [4]

Q.6 b Perform insert, remove, peek operations for priority queue operations using heap data structure for the elements 23,45,56,12,78. [6]