H

Roll No. .....

TBC–201/TBI–201

B. C. A./B. SC. (IT)
(SECOND SEMESTER)
MID SEMESTER
EXAMINATION, March, 2024

INTRODUCTION TO DATA STRUCTURES

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any ***one*** of the sub-questions.

(ii) Each sub-question carries 10 marks.

1. (a) Define the following : (CO1)

(i) Algorithm and its characteristics

(ii) Flowchart

(iii) Data structure

(iv) Asymptotic notations

OR

(b) What are the different ways of storing elements of 2-D array in memory ? If the

starting address of array CHAR A[1..5, 1..6] is 100 then what will be the address of A[3, 4] element in row-major order and in column-major order ? (CO1)

2. (a) Develop an algorithm to insert an element into the *k*th position of an array. Assume suitable algorithmic notations. (CO1)

OR

(b) What do you mean by pointer ? State the merits and demerits of static and dynamic memory allocation techniques. (CO1)

3. (a) What is structure ? Explain the difference between array and structures. (CO1)

OR

(b) How string is declared and initialized ? Explain any *four* string manipulation functions with examples. (CO1)

4. (a) Explain 'insertion at end' operation of singly linked list with algorithm/pseudo code. (CO2)

OR

(b) Explain the types of recursion. What are different applications of recursion ? (CO2)

5. (a) Write a short note on linked list and its types. What are the advantages of using linked list over using array ? (CO2)

OR

(b) Write an algorithm or function to show insertion operation in circular linked list. (CO2)