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Roll No. .....

TBC–201/TBI–201

B. C. A./B. SC. (IT)

(SECOND SEMESTER)

MID SEMESTER

EXAMINATION, 2021-22

DATA STRUCTURE AND FILE ORGANIZATION

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) What is an algorithm ? Explain different types and characteristics of an algorithm. Write an algorithm for swapping of two numbers without using third variable.

(CO1)

P. T. O.

OR

(b) Explain time complexity and space complexity of an algorithm in detail with examples. (CO1)

2. (a) Write short notes on the following : (CO1)

(i) Data Structure and its operations

(ii) Sparse matrix

OR

(b) What is a pointer ? Explain static memory allocation and dynamic memory allocation in detail with examples. (CO1)

3. (a) Describe STACK and its applications. Explain all the operations of a STACK with example. (CO2)

OR

(b) Describe QUEUE and its applications. Explain all the operations of a QUEUE with example. (CO2)

4. (a) Evaluate the following expression using STACK. Show all the steps while evaluating the expression : (CO2)

2 * (5 * (3 + 6)) / 5 – 2 +(3 ∧ 3) * 2 – 6 / 2

OR

(b) Convert the following expressions into postfix using STACK. Show all the steps while converting the expression : (CO2)

(i) A + (B*C – (D/E ∧ F)*G)*H

(ii) A*((B/C)*(D – E)∧F)

5. (a) What is a CIRCULAR QUEUE ? Explain all the operations of a CIRCULAR QUEUE with example. (CO2)

OR

(b) Write short notes on the following : (CO2)

(i) PRIORITY QUEUE

(ii) DEQUE