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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)

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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)

$2 * (5 * (3 + 6)) / 5 - 2 + (3 \wedge 3) * 2 - 6 / 2$

OR

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

(i) $A + (B*C - (D/E \wedge F)*G)*H$

(ii) $A*((B/C)*(D - E) \wedge F)$

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