

**UNIVERSITY COLLEGE TATI (UC TATI)****FINAL EXAMINATION QUESTION BOOKLET**

COURSE CODE	: DCT2023
COURSE	: DATA STRUCTURE AND FILE PROCESSING
SEMESTER/SESSION	: 2-2022/2023
DURATION	: 3 HOURS

Instructions:

1. This booklet contains 5 questions. Answer **ALL** questions.
2. All answers should be written in answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 4 PRINTED PAGES INCLUDING COVER PAGE

DATA STRUCTURE AND FILE PROCESSING (DCT2023)

QUESTION 1

- a) Define the meaning of Data Structure? (2 marks)
- b) List **FOUR(4)** types of data structure. (4 marks)
- c) Describe basic data terminology. (4 marks)
- d) File processing consist of creating, storing, and/or retrieving the contents of a file from a recognizable medium.
- i. Discuss **TWO(2)** ways to declare and open and input file. (2 marks)
- ii. Define **TWO(2)** ways to declare and open output file. (2 marks)

QUESTION 2

- a) Explain the concepts of linked list. (3 marks)
- b) Distinguish **THREE(3)** types of linked list. (3 marks)
- c) Illustrate and explain single linked list. (4 marks)
- d) Draw and explain two ways linked list. (4 marks)

QUESTION 3

- a) List **FIVE(5)** basic stack operation. (5 marks)
- b) Describe the concepts of stack with example. (4 marks)
- c) Complete the code below. (3 marks)
- i. Full stack

```
int fullStack (struc stack *)  
{  
    if ( _____ )  
  
    else _____;  
    _____;  
}
```

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- ii. Empty stack (3 marks)

```
int emptyStack (struc stack *)
{
    if ( _____ )
        _____;
    else
        _____;
}
```

- d) Explain the concepts of queue. (3 marks)

- e) Write the code of queue.

- i. Enqueue (insert) (6 marks)

- ii. Dequeue (remove) (5 marks)

QUESTION 4

- a) Explain **THREE(3)** ways of traversing in binary tree T with root R. (6 marks)

- b) Given a list of numbers below. Construct a binary tree. (8 marks)

12 22 8 19 10 9 20 4 2 6

QUESTION 5

- a) Define the concepts of sorting. (4 marks)

- b) Explain the concepts of insertion sort. (5 marks)

- c) Based on the following list, illustrate using selection sort. (6 marks)

12 8 10 9 15 20 4 2 6

- d) Differentiate between primary key and secondary key. (4 marks)

- e) Complete the following binary search code function. (10 marks)

```
void search(const int a[ ], size_t first, size_t size, int target, bool& found,
size_t& location)
{
```

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```
size_t middle;  
if(size == 0) found = false;  
else  
    .....(complete..)  
}
```

-----End of questions-----