

Reg. No.:

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TERM END EXAMINATIONS (TEE) – December 2021- January 2022

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|---------------------|--|------------------------|---------------------------|
| Programme | : B.Tech | Semester | : Fall 2021-22 |
| Course Name | : Introduction to Problem Solving and Programming | Course Code | : CSE1021 |
| Faculty Name | : Dr. Meenakshi Choudhary | Slot / Class No | : C11+C12+C13/0093 |
| Time | : 1½ hours | Max. Marks | : 50 |

Answer ALL the Questions

| Q. No. | Question Description | Marks |
|--------|----------------------|-------|
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PART - A (30 Marks)

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|---|---|----|
| 1 | (a) Analyze the time complexity of the following code. Derive the formula to compute the time complexity. | 10 |
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```
int a = 0, i = N;
while (i > 0)
{
    a += i;
    i /= 2;
}
```

OR

- | | | |
|--|--|----|
| | (b) Write a python program to find Find k^{th} smallest and k^{th} largest elements in an array. Analyze the time complexity of the algorithm. | 10 |
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| 2 | (a) Demonstrate the use of break, pass, and continue statements inside a while loop by writing suitable python program. | 10 |
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OR

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| | (b) Write a python program to generate prime integers within the specified range. The program should contain a function named “Generate_Prime” with two required parameters; “low” and “high” to define the range. Also analyze the time complexity of the program. | 10 |
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| 3 | (a) Generate random numbers using Multiplicative Congruential Generator, where $X_0 = 7$, $m = 11$, $a = 7$. | 10 |
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OR

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| | (b) Demonstrate call by value and call by reference to a function using python program. Illustrate the difference in the respective outputs. | 10 |
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PART - B (20 Marks)

- 4 Write the python program for Euclidian method to find GCD of two given numbers using function with required arguments. Also prepare a flowchart for the Euclidian algorithm. 10
- 5 Write a python program to merge two sorted arrays in third array such that it is also sorted. Analyse the time complexity of the algorithm used. Consider the given sorted arrays as follows: 10
- A1 = [2, 5, 7, 9, 15, 22]
A2 = [1, 4, 7, 11, 20, 31]

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