



# NATIONAL INSTITUTE OF TECHNOLOGY WARANGAL

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING  
I B.Tech., II Semester, Minor-1 Examination, May 2021  
CS101: Problem Solving and Computer Programming

Date: 29-05-2021

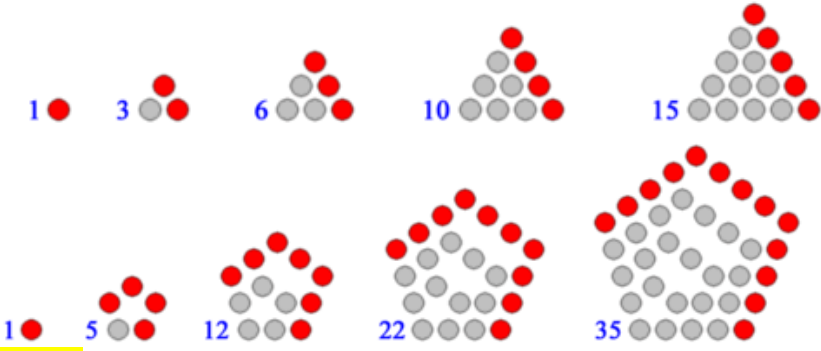
Time: 2 Hrs and 20 Mins

Max. Marks: 30

→ We have a total of SIX question.

→ Each question carries 5 marks.

	Question
1_A	You are given a 1D array of integers. Write a program to find the biggest of all the numbers at the Fibonacci sequence locations. Example: If the array is of size 10 and if the elements are {1, 4, 45, 2, 92, 108, 116, 7, 6, 9}. Then output is 45 108. (Mr.Sai Santosh)
1_B	You are given a 1D array of integers. Write a program to find the biggest of all the numbers at the prime number locations. Example: If the array is of size 10 and if the elements are {1, 4, 45, 2, 92, 108, 116, 7, 6, 9}. Then output is 108. (Mr.Sai Santosh)
2_A	A space research organization want to transfer a data securely from one planet to another. But company is concerned about the security of the data. All of their data are transmitted as four-digit integers. They have asked you to write a program that encrypts their data so that it can be transmitted more securely. Your program should read a four-digit integer and encrypt it as follows: Replace each digit by (the sum of that digit plus 7) modulus 10. Then, swap the first digit with the third, swap the second digit with the fourth and print the encrypted integer. Company ask you to write the code so that after receiving the data they can convert it into its original value. (Dr.Sujit)
2_B	Given an integer array of n integers, Write a program to find sum of bit differences in all pairs that can be formed from array elements. Bit difference of a pair (x, y) is count of different bits at same positions in binary representations of x and y. For example, bit difference for 2 and 7 is 2. Binary representation of 2 is 010 and 7 is 111 (first and last bits differ in two numbers). (Dr.Srinivas)
3_A	An organization have several type of employees like managers, hourly workers (who receive a fixed hourly wage for up to the first 30 hours they work and “time-and-a-half,” i.e., 1.5 times their hourly wage, for overtime hours worked), commission workers (who receive ₹ 500 plus 7% of their gross weekly sales), and pieceworkers (who receive a fixed amount of money per item for each of the items they produce—each pieceworker in this company works on only one type of item). Write a program to compute the weekly pay for each employee. You do not know the number of employees in advance. Each type of employee has its own pay code: Managers have employee_pay_code 1, hourly workers have code 2, commission workers have code 3 and pieceworkers have code 4. Use a switch to compute each employee’s pay based on that employee’s

	<p>employee_pay_code. Your program needs to calculate each employee's pay based on that employee's employee_pay_code.</p> <p>Your program will ask from user to enter the employee_pay_code for the employee. As user will enter the employee_pay_code it will show that you have selected this particular employee. Now it will ask to user to enter the details regarding salary accordingly. After getting the details program will show the final salary and again it will ask to enter the employee_pay_code. Program will run and ask continuously until user will enter -1.</p> <p>(Dr.Sushil)</p>
3_B	<p>Write a C++ program to display the leap years that contain the digit 'x' given by the user, between two given year n1 and n2 both inclusive. For example, if n1 and n2 are 1990 and 2020 and if the digit 'x' is 6, the outputs need to be: The number of leap years between 1990 and 2020 that contains the digit 6 are: 1996, 2016. (Dr.USN)</p>
4_A	<p>Write a C++ program to find the area of the largest possible square that can be formed from the given a square tile (in cms) and the number of such square tiles available (use loops).</p> <p><b>Sample Output:</b></p> <p>Enter the length of a square tile (in cms): 5</p> <p>Enter the number of square tiles available: 8</p> <p>Area of the largest possible square is: 100 (Ms.Rachana)</p>
4_B	<p>The ancient Greeks classified numbers geometrically. For example, a number was called '<i>triangular</i>' if that number of pebbles could be arranged in a symmetric triangle. The first ten triangular numbers are 0, 1,3,6,10, 15,21, 28, 36 and 45. Similarly, a number was called '<i>pentagonal</i>' if that number of pebbles could be arranged in symmetric pentagon. The first ten pentagonal numbers are 0,1,5,12,22,35,51,70,92 and 117. Write a C++ program, to check the given number is triangular/pentagonal/both.</p> <div></div> <p>(Dr.Sandhya)</p>
5_A	<p>A trade union of Hyderabad decided to organize a Trade Fair at Nampally Exhibition ground for a month. There are x number of people have attended the event on the first day. Because of the mouth publicity the number of people who attended the event on the second day has doubled the number of people who attended on the first day. Unfortunately due to fire accident on the third day the number of people who attended</p>

	<p>the event was exactly one fourth (1/4) of people who attended on the first day.</p> <p>Given the total number of people who have attended the event on the first three days.</p> <p>Write a C++ program to find the number of people who have attended the event on day 1, day 2 and day 3. (Dr.Sanjaya Panda)</p>
5_B	<p>Write a program to find the second largest number among n numbers entered. Example: Input: 840, 288, 261, 337, 335, 488 Output: 261. Note that you should not use arrays for it.</p> <p>(Mr Pravin Mundhe)</p>
6	<div><div><p><b>Input 1:</b></p><p><b>If input is</b></p><p>Enter n Value: 5</p><p>Enter uppercase alphabet: A</p><p>Enter special character: @</p><p>Enter lowercase alphabet: e</p><p><b>Then output to be</b></p><pre>A A A A A A A A A A A A A @ A A A A A A A @ e @ A A A A A @ e e e @ A A A @ e e e e e @ A 5 5 5 5 5 5 5 5 5</pre></div><div><p><b>Input 2:</b></p><p><b>If input is</b></p><p>Enter n Value: 4</p><p>Enter uppercase alphabet: H</p><p>Enter special character: *</p><p>Enter lowercase alphabet: r</p><p><b>Then output to be</b></p><pre>H H H H H H H H H H * H H H H H * r * H H H * r r r * H 4 4 4 4 4 4 4</pre></div></div> <p>(Ms.Navya)</p>