# **Question Paper**

Exam Date & Time: 29-Jun-2022 (09:00 AM - 12:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

#### SECOND SEMESTER B.TECH. EXAMINATIONS (MIT MANIPAL) - JUNE/JULY 2022 SUBJECT : CSE 1051 - PROBLEM SOLVING USING COMPUTERS

#### PROBLEM SOLVING USING COMPUTERS [CSE 1051]

#### Marks: 50

#### Answer all the questions.

- 1A) Write an algorithm and draw a flowchart to check if a given number is a spy number. (4)Hint: A number where the sum of all the digits is equal to the product of the digits is known as a spy number. e.g: Spy Numbers: 123, 1214 Not Spy Numbers: 1441, 45 Write the basic structure of a C Program. Discuss each section briefly with suitable example. 1B) (3)1C) Evaluate the following expressions, given a=3, b=5, c=9, p=10, q=8, r=11, m=5, n=4, x=12, y=2, (3)z=6. Show all the intermediate steps. i)  $x/y + z - m^*y < y + p/m^*a + r$ ii) n \* q < = 3 \* m + c / a iii) (m /n != q - 5) && (b>a) 2A) Write a C program using nested if else statements to check whether a student is eligible for (3)scholarship or not. The user needs to enter the total of six subject marks (each out of 100) and the program checks the student's eligibility for scholarship. The student is given full scholarship if the total marks is greater than or equal to 540, 50% scholarship if total marks is greater than or equal to 480, 20% if the total marks is greater than or equal to 400. Any other marks other than mentioned are not eligible for scholarship.
- 2B) Write a C program using **do-while** loop to print the multiplication table upto 12 terms for a given (3) number. The table should be printed for all numbers entered by the user until -1 as given in sample input/output:

Duration: 180 mins.

Enter	the	number2
2		
4		
6		
8		
10		
12		
14		
16		
18		
20		
22		
24		
Enter	the	number5
5		
10		
15		
20		
25		
30		
35		
40		
45		
50		
55		
60		
Enter	the	number-1

2C)

Given a 1D array of integers, perform the following tasks:

(4)

Task-1: Identify 2 integers in the given 1D array for which the product is the maximum amongst all the products. Display the indices for these 2 integers.

Task-2: Identify 2 integers in the given 1D array for which the product is the minimum amongst all the products. Display the indices for these 2 integers.

### Sample Result:

	How many elements: 6	
	Enter 6 elements: 10 0 -6 0 5 -10	
	<pre>Max. product = 60, max_prod_ind1 = 2, max_prod_ind2 = 5 Min. product = -100, min_prod_ind1 = 0, min_prod_ind2 = 5</pre>	
3A)	Write a C program to read a 2D array and print it in the matrix form, with sum of all elements in each row, at the end of each row.	(3)
3B)	Write a C program to check whether the entered number is an Armstrong Number using User- defined Function. Hint: An Armstrong number is an integer such that the sum of the cubes of its digits is equal to the number itself.	(3)
3C)	Write a C function TwoPrime () to check whether a given number can be expressed as sum of two prime numbers, if so, display the 2 prime numbers, otherwise specify that the number cannot be expressed as sum of two prime numbers. Write a main() function which reads n numbers and prints the result by calling above function for each number. Sample Input/Output: Enter n = 3, Enter Numbers: 11 , 12 , 14 Output: 11 cannot be expressed as sum of 2 prime numbers: 12 = 5 + 7 14 = 7 + 7	(4)
4A)	Write any 4 differences between recursion and iteration.	(2)

- 4B) Write a C program to check if the given number is a prime or not using recursion.
- 4C) Define a structure **student** to store the **name** and **marks** for 3 courses of a student. Write a C (5) program to read the data of **N students** using the structure defined and display the same. Compute the average marks and display the name with the computed average for each student. Using the computed average score, display the name of the topper (student with a maximum average score) without sorting.
- 5A) Define a structure **Customer** with customer\_id, customer\_name, Acc\_open\_date (date can be an (3) array of 3 integers) and acct\_balance as its members. Using this structure, write a C program to read the information of three (3) customers and print the details of customer having highest account balance.
- 5B) Define a structure **employee** with **Name**, **no\_of\_days** and **salary** as its members. Write a C (3) program using above structure, to calculate three employees (use array of sructures) salary based on number of days worked. Use pointer to access the members of the structure. Assume a remuneration of Rs. 750 per day to calculate the salary.

5C) Discuss on different areas where computers are used to commit crimes with suitable examples. (4)

-----End-----

(3)