VIT

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

Continuous Assessment Test-1 (CAT-1) – March 2023

Programme	: B.TECH CSE and its Specialization	Semester	: **Winter 2022-23**
Course Title	: **Structured and Object-Oriented Programming**	Code	: **BCSE102L**
		Slot	: **G1**
Faculty	: Dr. R. Sendhil Dr. Vijayaprabakaran K Dr. Ilavendhan A Dr. Vallidevi K Dr. S Jahangeer Sidiq Dr. Pankaja Lakshmi P Dr. Palani Thanaraj K	Class Nbr	: **CH2022232300541** **CH2022232300534** **CH2022232300536** **CH2022232300537** **CH2022232300540** **CH2022232300538** **CH2022232300542**
Duration	: **1 hour 30 mins**	Max. Marks	: **50**

Answer all the Questions

Ques. No.	Question Description	Marks
1.	Prajan studying 2nd Standard in a CBSE Board. He needs to complete his maths subject homework with some basic arithmetic calculations. Your task is to write a menu-driven C program using a switch case with the flowchart, to perform various arithmetic operations like Addition, Subtraction, Multiplication, Division, and Modulo operations with different data types like an integer for subtraction, division and modulo, float datatype for Addition and Multiplication.	[10]

2. Write a C program to help the VIBRANCE organizers in picking the lucky person from the registered list. The organizers have planned to pick five registered participants and they have planned to implement the following: **[10]**

Hint: The registered participants will get the register numbers in six digits, which start with the number 233 and the remaining digits are one of the following 001, 002, and so on till 100.
Examples of some numbers are: 233001, 233002, ...233100

i) To find the sum of all the digits for those five lucky dips. Example: 233031 - 12, 233034 – 15 and 233036 - 17. **(2 Marks)**

ii) Based on the unit's digit value (digit in the 0th place of the sum) of the sum obtained in the previous step, the lucky winners prizes are announced. **(6 Marks)**

a) If the unit's digit value is less than or equal to the number three, then that registered number will get the first prize. So print the result in the format given:
      Register Number - First Prize
      Example: 233031 - First Prize
b) If the unit's digit value is 4 or 5 then, the registered number will get the second prize. So print the result in the format given:
      Register Number - Second Prize
      Example: 233034 - Second Prize
c) If the unit's digit value is from 6 to 9, the registered number will get the third prize. Print the result in the format given:
      Register Number - Third Prize.
      Example: 233036 - Third Prize

iii) Finally, print the number of prize winners declared under each prize category. **(2 Marks)**

3. A sports club is conducting game events for the 10 registered participants (Player_A, Player_B......, Player_J). Each participant is eligible for all three game events. Based on their performance in the game, a score will be awarded to them. Each participant got a score for each they participated if they did not participate "0" score will be given. For example, the scores of each player (A, B, ...J) in three different game events are stored in the following format; **[10]**

Football = {10,7,4,6,9,5,9,0,10,8}

Gymnastics = {8,10,9,7,4,10,9,8,7,0}

Athletics = {8,10,5,10,8,4,7,8,9,9}

Write a C program to read ten players' scores for each event and store them in the above format using an array. Find each game's Star Player (max score in a game) and find the overall star player of the sports day's gaming events (i.e. player who got a max score in all three games).

4. Read the String with the combination of alphanumeric, space, and special characters. Write a menu-driven program in C language to analyze the input string under different string operations. Use switch cases to perform the following operation **[10]**

1) Display the string in reverse order **(2 Marks)**

2) Display the total number of spaces, alphabets, numbers, and special characters in the given string **(2 Marks)**

3) Copy the input string and paste it into another string without using the predefined string copy function. Also, display the number of characters copied from the source to the destination string. **(3 Marks)**

4) Consider all the alphabets in the string and then sort them in ascending order. **(3 Marks)**

5. Raju works for a XYZ car manufacturing company, and his task is to design a system that keeps track of the total number of cars produced by the company, as well as the number of cars produced by each factory of the company. He decides to use C programming language to implement this system. To achieve this, Raju defines a variable called "total_cars" that keeps track of the total number of cars produced by the company. He also defines a variable called "factory_cars" to keep track of the number of cars produced by each factory of the company. His task is to implement a subroutine called "produce_car" that takes an integer input argument from the factory manager representing the factory number to produce a car. The factory number is bounded by a constraint $0 \leq N \leq 9$. For example, every time produce_car subroutine is called, a car is produced from the specified factory. The subroutine should increment both the "total_cars" and the corresponding "factory_cars" variables, and then print a message indicating that a car has been produced by the specified factory also indicating the total number of cars produced by the company. Given a moderate car sales season, assume that the factory manager schedules five production calls in a given time. Use arrays where ever applicable. **[10]**

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