| **Registration Number** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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**SRM Institute of Science and Technology** 

**College of Engineering and Technology**

**School of Computing**

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamil Nadu

**Academic Year: 2024-25 (ODD)**

**ANSWER KEY**



**Test: CT1 Date**: 30-09-2024

**Course Code & Title: 21CSS101J Programming for Problem Solving Duration:** 1hr 40 mins

**Year &Sem: I/I Max. Marks: 50**

**Course Articulation Matrix: *(to be placed)***

| **S.No** | **Course**  **Outcome** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **CO1** | **2** | **3** |  |  |  |  |  |  |  |  |  | **2** |
| **2** | **CO2** | **2** | **3** |  |  |  |  |  |  |  |  |  | **2** |
| **3** | **CO3** | **2** | **3** |  |  |  |  |  |  |  |  |  | **2** |
| **4** | **CO4** | **2** | **3** |  |  |  |  |  |  |  |  |  | **2** |
| **5** | **CO5** | **2** | **3** |  |  |  |  |  |  |  |  |  | **2** |

**Course Outcomes (CO):**

**CO-1:** Solve problems through computer programming. Express the basic data types and variables in C

**CO-2:** Use appropriate data types in simple data processing applications. To create programs using the concept of arrays.

**Part A (10\* 1 = 10 Marks)**

| **Sl.No** | **Question** | **Marks** | **BL** | **CO** | **PO** | **PI Code** |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | C) bool | **1** | **1** | **1** | **1** | **1.4.1** |
| 2 | Answer is 50. Choice not given if attempted give the mark | **1** | **1** | **1** | **1** | **1.3.1** |
| 3 | A) const int x = 10; | **1** | **2** | **1** | **2** | **2.2.3** |
| 4 | A) & | **1** | **2** | **1** | **2** | **2.2.4** |
| 5 | B) 10 | **1** | **2** | **1** | **2** | **2.4.1** |
| 6 | A) 1 2 3 | **1** | **2** | **2** | **2** | **2.1.2** |
| 7 | A) Greater than 5 | **1** | **2** | **2** | **2** | **2.4.2** |
| 8 | B) int x = 5; | **1** | **2** | **1** | **2** | **2.4.2** |
| 9 | C) 11 | **1** | **2** | **1** | **2** | **2.4.2** |
| 10 | B) 15 | **1** | **2** | **1** | **2** | **2.4.2** |

**Part B (5 \* 4 = 20 Marks)**

| **Sl.No** | **Question** | **Marks** | **BL** | **CO** | **PO** | **PI Code** |
| --- | --- | --- | --- | --- | --- | --- |
| 11 | Illustrate the concept of operator precedence in C through an example.   * **Operator precedence table (2)** * **One simple expression evaluation example (2)** | **4** | **2** | **1** | **1** | **1.4.1** |
| **12** | You are tasked with devising an algorithm for a basic calculator for a small grocery store to help the cashier to calculate the total price of two items. The cashier will input the price of both items, and your algorithm should calculate and display the total cost.  **Total 5 steps, the algorithm must input 2 values find the total and display it.**   * **Reading input (1)** * **Processing the data (2)** * **Display output (1)** | **4** | **3** | **1** | **1** | **1.4.1** |
| **13** | Debug the code and generate the output as return 0 or return 1.  #include<stdio.h>  int main()  {  int n;  long sum=0; **delete this**  printf(“Enter a positive integer:”);  scanf(“%d”,&n);  if(n<0)  {  printf(“Please enter a positive number greater than zero.\n”); **delete this**  **return 1; change this to printf(“return 0”);**  }  **else**  **{**  **printf(“return 0”);**  **}**  for(i=1;i<n;i++)  {  sum+=i\*i;  }  printf”(The sum of squares of the first %d natural numbers is:%d\n”,n,sum); **delete this**  return 0;  } | **4** | **3** | **2** | **2** | **2.3.1** |
| **14** | **Fill the code given and explain how the desired output will be generated.**  #include <stdio.h>  int main() {  int number;  printf("Enter a number: ");  scanf("%d", &number);  if (number> 0) { // Blank 1  printf("The number is positive.\n");  }  else if (number < 0) { // Blank 2  printf("The number is negative.\n");  }  else {  printf("The number is zero.\n"); // Blank 3  }  return 0;  } | **4** | **3** | **2** | **2** | **2.4.2** |
| **15** | You are working on a banking application that requires a feature to help customers track their daily expenses. The program should allow users to input their daily expenses one at a time. When the user enters a negative value, it indicates that they have finished entering expenses for the day. Implement using a C program to calculate and display the total amount spent.  **Algorithm(or)Program**  **User Input the expense (1)**  **Check for negative value to stop the input(1)**  **Find the total expense(1)**  **Display the final savings(1)** | **4** | **3** | **2** | **4** | **2.4.2** |

**Part C (2 \* 10 = 20 Marks)**

| **Sl.No** | **Question** | **Marks** | **BL** | **CO** | **PO** | **PI Code** |
| --- | --- | --- | --- | --- | --- | --- |
| **16** | Design an algorithm and implement the same using C program for carrying out the following tasks   * Read yesterday’s and today’s temperature * Find the difference * Using an operator print “Increase” if today’s temperature is higher and print “Decrease” otherwise. * **Input 2 temperatures (2)** * **Calculate the temperature difference(2)** * **Use the ternary operator to check in increase or decrease based on this display the result(6)** | **10** | **3** | **1** | **4** | **4.1.2** |
| **(OR)** | | | | | | |
| **17** | A company calculates the salary of an employee based on the category of the employee. For daily wage employees, their salary is based on the number of hours worked and the rate per hour. On the other hand, regular employees have a more structured salary calculation, which takes into account several components such as basic pay, allowances, and additional benefits. For example, a regular employee’s salary includes a fixed basic pay, which is then increased based on factors like a predefined percentage of Dearness Allowance (DA), a specific House Rent Allowance (HRA), and a medical allowance. Each of these components contributes to the final salary calculation. the correct calculation is applied based on the employee type, with the appropriate salary elements factored in for each type of employee.   * **User Input the employee type (1)** * **Based on the employee type 1 or 2 input the allowances(1)** * **calculate the salary of the employee using the ternary operator (6)** * **Display the desired output (2)** | **10** | **3** | **1** | **4** | **4.1.2** |
| **18** | You are developing a simple traffic light control system. The system controls the flow of traffic at an intersection. The lights can be:  Green: Vehicles can move.  Yellow: Vehicles should slow down.  Red: Vehicles must stop.  The traffic light's state is represented by three flags:  isGreen, isYellow, and isRed (all are either 0 or 1).  Write a C program that takes the states of the traffic lights as input and prints:  "Go" if the light is green.  "Slow Down" if the light is yellow.  "Stop" if the light is red. If more than one light is on or no light is on, print "Invalid signal".   * **Input the 3 state of lights (3)** * **Use if-else or switch statements to check and display which light is on(6)** * **Display of output(1)** | **10** | **3** | **2** | **4** | **4.1.2** |
| **(OR)** | | | | | | |
| **19** | Write a program that simulates an ATM withdrawal process. Repeatedly ask the user to enter the amount they want to withdraw until they enter a valid amount that does not exceed their account balance.   * **Initialize one variable for balance(1)** * **User input(1)** * **Using do-while loop get the withdrawal amount and check for valid amount using if-else-if(7)** * **Display the output(1)** | **10** | **3** | **2** | **4** | **4.1.2** |

**Course Outcome (CO) and Bloom’s level (BL) Coverage in Questions**