Final Assessment Test – June 2023

VIT
Vellore Institute of Technology

Course: BCSE102L - Structured and Object-Oriented Programming
Class NBR(s): 5591/5593/5595/5599/5601/5604/5606/ 5611/5616/5617/5619/5621 Slot: G1
Time: Three Hours Max. Marks: 100

KEEPING MOBILE PHONE/SMART WATCH, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE

General Instructions:

1. **Students are instructed to write main method also for programming questions and provide syntax with suitable example for theory questions.**
2. **Write the program Objective, Algorithm and code for all programs.**

Answer ALL Questions

(10 X 10 = 100 Marks)

1. Explain the following decision-making statements with syntax and also write a C program, to check whether the given year is a leap year or not.

   a) if

   b) switch

   c) conditional or ternary operator

   d) goto

   Note: You can reframe the question to accommodate the above statements in the implementation of the logic, but need to use all the four statements in a single program that will check if a given year is leap year or not.

2. Consider there are two square matrices *A* and *C*. Write a C program to check

   a) If the *C* matrix is the transpose of the *A* matrix [5]

   b) If the left diagonal elements of the *C* matrix is same in all the left diagonal positions. [5]

3. a) What will be the output of the following program [4]

```
#include <stdio.h>
void func(void);
static int count = 5;
main() {
while(count--) {
 func();
}
return 0;
}
void func( void ) {
 static int i = 5;
 i++;
printf("i is %d and count is %d\n", i, count);
}
```

b) Consider a suitable example program of your own and explain the significance of using call by value and call by reference in C. [6]

4. Explain the following in C using suitable example
   a) How to handle arrays in a function through their corresponding pointers as function parameters. [5]
   b) How to handle the situation of returning more than one value in functions. [5]

5. Implement a C program using a structure named shopping_bill. Consider necessary members like itemName, itemUnitPrice as members. Prepare the shopping bill considering array of structures to implement the items purchased. Note: Implement the scenario using functions.

6. Define the following with suitable example:
   a) Static data member and static member function [5]
   b) Data hiding and encapsulation [5]

7. Consider a scenario of your own and explain the following inheritance concepts
   a) Multilevel Inheritance [5]
   b) Hiearchichal Inheritance [5]

   Note: Implement parameterized constructors both in parent class and derived with an classes example while explaining the above mentioned concepts.

8. a) List down the operators that cannot be overloaded in C++ [2]
   b) Assume a class named Distance with "feet" and "inch" as data members in it. With this data members and class implement a C++ program that can perform decrementation of "feet" and "inch" values by overloading unary operator "-" and can perform addition of "feet" and "inch" values of two Distance objects by overloading binary operator "+". [8]

9. Consider a class to check for the strength of a password. In this regard a function password_strength() is to be implemented. Assume that the function password_strength() has to print the total number of blank spaces, consonants and vowels in the given string. Implement the mentioned example in C++ using pure virtual function.

10. a) Implement a C++ program to modify vector of integers using push_back() and pop_back() functions. [5]
    b) Implement a C++ program to convert the vector of characters into string using push_back() function. [5]

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