Vavuniya Campus of the University of Jaffna

First Examination in Information and Communication Technology - 2017

First Semester - September/October 2018

ICT1162 Practical for Introduction to Program Design and Programming

Answer All Questions

Time Allowed : **Three** hours

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1. Write a C++ program that finds and prints all of the prime numbers between 3 and 100. A prime number is a number that can only be divided by one and itself (i.e., 3, 5, 7, 11, 13, 17). [20%]

2. Write a C++ program that simulates a lottery. The program should have an array of `8` integers named `winningDigits`, with a randomly generated number in the range of `0` through `9` for each element in the array. The program should ask the user to enter `8` digits and should store them in a second integer array named `player`. The program must compare the corresponding elements in the two arrays and count how many digits match. For example, the following shows the `winningDigits` array and the `player` array with sample numbers stored in each. There are two matching digits, in the 4^{th} and the 6^{th} places.

[This question is continued on the next page]

Winning Digits: 1 4 0 3 1 8 9 4

Player Digits: 6 2 5 3 4 8 1 7

Once the user has entered a set of numbers, the program should display the winning digits and the player's digits and tell how many digits matched.

Input validation: *Do not accept player inputs less than 0 or greater than 9.*

Hint:

- `rand()%10` - *generate random number between 1 to 9; to use this predefined function need to include* `cstdlib` *library*
- `srand(time(NULL))` - *time to time change the random number value; to use this predefined function need to include* `ctime` *library*

[40%]

3. Write a C++ program to compute `health club` membership fees as a menu-driven program with the following instructions as given below.

   (a) This club maintains the constant monthly membership rates for each of the membership types as follows:

   - `Adult Rate - $40`
   - `Senior Rate - $30`
   - `Child Rate - $20`

   (b) This program consists with three functions:

   - `void displayMenu()`-This function displays the menu choices.

     1. `Standard Adult Membership`
     2. `Child Membership`
     3. `Senior Citizen Membership`
     4. `Quit the Program`

[This question is continued on the next page]

- `int getChoice()`- This function takes user input(menu choice), validates the choice between 1-4, and returns the user's menu choice value.
- `void showFees(string memberType, double rate, int months)`- This function uses the membership type, monthly rate, and the number of months passed to it as arguments to compute and display a member's total charges.

(c) The main program should call the above three functions to compute health club membership fees.

The following figure shows the sample output:

```
Health Club Membership Menu

1. Standard Adult Membership
2. Child Membership
3. Senior Citizen Membership
4. Quit the Program

Enter the choice to access the menu-driven program that computes health club membership fees: 6

   The only valid choices are 1-4. Please re-enter. 3

For how many months? 5

      Membership Type : Senior Number of months: 5
      Total charges : $150

Health Club Membership Menu

1. Standard Adult Membership
2. Child Membership
3. Senior Citizen Membership
4. Quit the Program

Enter the choice to access the menu-driven program that computes health club membership fees: 4
```

[40%]