Course Code: CS1004	Course Name: Object Oriented Programming
Instructor Name: Dr. Farooque Hassan Kumbhar, Dr. Abdul Aziz, Mr. Zain ul Hassan, Ms. Farah Sadia, Ms. Nida Munawar, Ms. Abeer Gauher, Mr. Basit Ali	
Student Roll No: 21K-3158	Section No: BCS-2J

Instructions:

- Return the question paper and make sure to keep it inside your answer sheet.
- Read questions completely before answering. There are **3 questions, 2 sides on 1 page**.
- In case of any ambiguity, you may make assumption. But your assumption should not contradict any statement in the question paper.
- You are **not allowed to write** anything on the question paper (except your ID and section).

Time: 60 minutes.   **Max Marks:** 48 Marks

Q 1. Write single-line short answers to the following questions: [10 min, 10 Marks]

  a. If we add a parameterized constructor, then there is no need for a setter function. Do you agree with this? explain.

  b. Why a constructor does not return anything, although it is a function and function must return?

  c. Why do we need to add a DEFAULT constructor, if it does nothing?

  d. What happens if an attribute does not have a setter function?

  e. Why do we need **separate setter functions** for every data element, we can create a combined setter as well? Discuss.

  • f. A static function can be called using an object reference, then why is it recommended to use a class reference?

  g. When do we want to declare a function as private?

  h. What happens if a constructor is declared private?

  • i. What should we do to restrict our object to be copied by other objects of the class?

  j. What is the size of a class with two *int* and one *char* member variables?

Q 2. Consider the classes and their members in the diagram given below and perform the tasks that follow: [25 min, 18 Marks (3 each)]
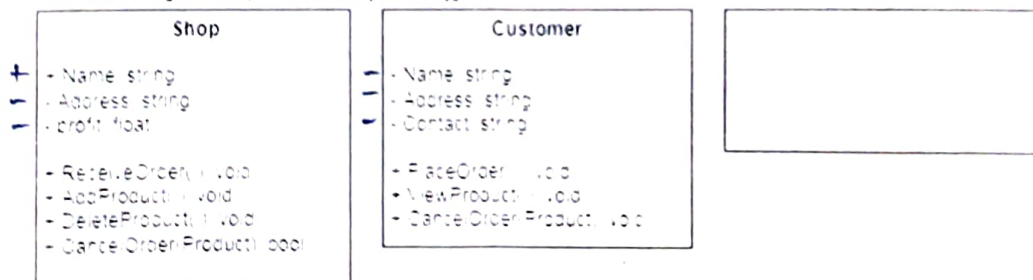
a) Convert the entities Shop and Customer in given diagram to OOP classes and write the member variables with their correct access modifiers.

b) Create a new UML/Class Diagram for a third entity named Product. Show some attributes of Product you can think of in your diagram. In your Product UML/Class Diagram, write

appropriate function prototypes if we desire functionality to update and read the attributes of Product.

c) Write product class for your Product UML/Class Diagram, write appropriate function if we desire functionality to calculate how many products have been created.

d) Write program of parameterized constructor for each of the three classes.

e) Implement the functions AddProduct and DeleteProduct to allow for creation and removal of a product. You can declare any appropriate parameters for these functions.

f) Implement the functions PlaceOrder to allow for purchase of a product and ReceiveOrder for displaying the total bill. You can declare any suitable parameters for these functions.

Q 3. Design a class VideoTape whose data members are private. The data members are labelled: string Title is a programme title, int Duration is the running time of the programme in minutes, double Size is the video size in GB's, string Created is a const data member of a class and it stores created date and time, string Resolution is given in pixels, and string Classification of the programme(Comedy, Drama, or Talk Show). **[25 min, 20 Marks (5 each)]**

    a. (The default constructor of the class should initialize Title is "TITLE", Duration is 0, Size is 5.02, Created is "2010-07-09,21:42:40", Resolution is "1920 X 1080 pixels", and Classification is "CLASSIFICATION".) A parameterized constructor (string Title, int Dur, double Size, string Created, string Resolution, string Classification) should initialize VideoTape's data members just make sure classification should be from given range as given above. If classification does not match from above mentioned programme list, assign the right value using SetClassification().

    b. Create a VT1 and VT2 objects with a given Title, Duration, Size, Created, Resolution, and Classification. Create VT3 and copy VT1 data in it.

    c. Implement the following functions:
        i. string getTitle(); - Return VideoTape's Title
        ii. int getDuration(); - Return VideoTape's Duration
        iii. void setDuration(int); Update VideoTape's Duration
        iv. double getSize(); - Return VideoTape's Size
        v. string getCreated(); - Return VideoTape's Created
        vi. string getResolution(); - Return VideoTape's Resolution
        vii. string getClassification(); - Return VideTape's classification
        viii. void setClassification(string);

    d. Compare method is a member function of a class VideoTape, in this function compare VT2 and VT3 and display only the maximum duration Tape details using display function. Also void Display () - print the details of the video tape to the output terminal in the following format: Title (Classification) Duration minutes, Size GBs.

BEST OF LUCK!