

Exam Question (60 percent weightage)

[a = 10, b = 10, c = 10, d = 10, e = 10, f = 10]

Write a Console Program with the following requirements:

- a) Define a base class called Sensor that has a property called Name and two virtual methods called ReadData and WriteData. Define three derived classes called TemperatureSensor, PressureSensor, and HumiditySensor. Each derived class should have a private field to store the sensor data (e.g., temperature, pressure, or humidity), and should override the ReadData and WriteData methods to display and store the sensor data.
- b) Define a fourth derived class called CombinedSensor that inherits from the Sensor class. The CombinedSensor class should have member called sen_list that is a list of Sensor objects. It should also have a method called AddSensor that adds a Sensor object to the sen_list. The ReadData method should display the name of the combined sensor and then call the ReadData method of each Sensor object in the sen_list.
- c) In the Main method create three objects of the TemperatureSensor, PressureSensor, and HumiditySensor classes. Call the WriteData method of each object to set the sensor data, and then call the ReadData method of each object to display the sensor data.
- d) Create two objects of the CombinedSensor class. Add the TemperatureSensor and PressureSensor objects to the first CombinedSensor object, and add all three sensor objects to the second CombinedSensor object. Call the ReadData method of each CombinedSensor object to display the sensor data.
- e) At the end of the program in multi-line comments describe how did you solve this problem i.e., what concepts did you use to solve this problem. Identify limitations of your program and provide suggestions for addressing them if possible.
- f) Make assumptions wherever necessary and think logically.