Object Oriented Programming (SWE-103)

Lab Exam Instructions:

- **Attempt 4 questions in all.**
- **The formula for Question is next question is**

Question 1= (Rollno%10)+1 for e.gRollno is 125%10=5+1 Result 6.

Question 2=(Rollno%10)+2 =5+2 Result 7

Question 3=(Rollno%10)+3 =5+3 Result 8

Question 3=(Rollno%10)+4 =5+4 Result 9

You need to attempt Part 6, 7, 8 & 9.

(NOTE: If Result greater than 10, then take Result%10)

1) Create an abstract class Employee containing emp_name(String),emp_code(int),emp_designation(String),emp_salary(float). The class contain a parameterized constructor for initialization. The class also contains an abstract method AnnualSalary() and concrete method ShowSalary() for displaying employee details. Then create classes Manager and Supervisor both derived from Employee classand override AnnualSalary() method to display Annual Salary after 10% Bonus Increment(for Supervisor) and 20% Bonus Increment(for Manager). Finally create Testing class containing main() method and create 1 object of Manager and Supervisor each. Use constructor for inputs and display Annual Salary for both Employees.

2) Create a class Student containing hidden information of Name(String) , Roll no(int). The class contain non parameterized constructor setting Name to null and Roll no to 0. The class contain parameterized constructor setting Name and Roll no to given inputs. The class also contain Show() method for displaying student information. Then create a child class student1 containing hidden information of Section(char)and Batch(int). The class contains overloading constructor callingparent constructorto set values either to 0 or to given values. The class also contain Override Show() method for displaying information. Finally create testing class containing main() method and create 3 objects of student1 class. Initialize all 3 objects using different constructor. Finally display information.

3) Create an abstract class called GeometricFigure. Each figure includes a height, a width, a figure type, and an area. Include an abstract method to determine the area of the figure. Create two subclasses called Square and Triangle. Create an application that demonstrates creating objects of both subclasses, and store them in an array and display area

4) Create a circle class with a private data member radius and having methods: double getRadius(), void setRadius(double value), double calculateCircumference(),double calculateArea(), and void ShowCharacteristics() to display circle information. Create a class inheriting circle known as Sphere & provide a methodShowCharacteristics( ) to display Sphere information. Finally create testing class having main method and create 1 object of circle and sphere class. Initialize both objects by using different functions and show characteristics of both circle and sphere.

5) Create a class calendar containing private information of months,days, hours and seconds. The class contains parameterized constructor to initialize calendar class. the class contain a method void Round(Calendar c)) that will take calendar object as input and round seconds, hours and months respectively (1 hour = 60 secs, 1 day = 24 hours and 1 month = 30 days). The class also contain void ShowCalendar() method that will display information in rounded form. Then create a main class and create 2 instance of calendar class providing values of months, days, hours and seconds. Call Round() method passing instance as input to round the information and finally call ShowCalendar() method to display rounded information of both instances.

6) Write a program that creates two classes one is Room and another is the main method class. Room class contains room_code(int), type(String), room_category(String) and price(float) fields, and three constructors; one is a default constructor, the second constructor contains three field room_code, type, and price and if the price is Rs 5000 set room_category to “Single”if the price is Rs 10000 set room_category to “Double”if the price is Rs 20000 set room_category to “Deluxe” and if the price is Rs 30000 set room_category to “Executive” and third constructor contain four fields room_code, type,room_category, and price. Display information of employee using display method In Java. In main class create 3 objects of Room class. Initialize these objects using different constructors and finally display method to show information.

7) Write a program that accepts a random temperature in integer range from -10 to 50 and displays an equivalent weather: Cold Weather (-10-15), Mild Weather (16–25), Hot Weather (26–35), Hottest Weather (above 35). Throw an exception if the input is in the wrong format or if it is out of range, print an error message, and halt gracefully.

8) Create an abstract Auto class with fields for the car make and price. Include get and set methods for these fields; the setPrice() method is abstract. Create two subclasses for individual automobile makers (for example, Ford or Chevy), and include appropriate setPrice() methods in each subclass (for example, $20,000 or $22,000). Finally, write an application that uses the Auto class and subclasses to display information about different cars.

9) Design a class named Fan to represent a fan. The class contains:
    - Three constants named SLOW, MEDIUM, and FAST with the values 1, 2, and 3 to denote the fan speed.
    - A private int data field named speed that specifies the speed of the fan (the default is SLOW).
    - A private boolean data field named on that specifies whether the fan is on (the default is false).
    - A private double data field named radius that specifies the radius of the fan(the default is 5).
    - A string data field named color that specifies the color of the fan (the defaultis blue).
    - The accessor and mutator methods for all four data fields.
    - A no-arg constructor that creates a default fan.
    - A method named DisplayInfo() that returns a string description for the fan. If the fan is on, the method returns the fan speed, color, and radius in one combined string. If the fan is not on, the method returns the fan color and radius along with the string “fan is off” in one combined string.

10) Design a class named Stock that contains:
    - string data field named symbol for the stock’s symbol.
    - A string data field named name for the stock’s name.
    - A double data field named previousClosingPrice that stores the stock price for the previous day.
    - A double data field named currentPrice that stores the stock price for the current time.
    - A constructor that creates a stock with the specified symbol and name.

- A method named getChangePercent() that returns the percentage changed from previousClosingPrice to currentPrice.

Write a test program that creates a Stock object with the stock symbol ORCL, the name Oracle Corporation, and the previous closing price of 34.5. Set a new current price to 34.35 and display the price-change percentage.