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B.Tech. First Assessment Examinations – August 2017

Third Semester

Computer Science & Engineering

15CSE202 Object Oriented Programming

[Time: Time Hours Maximum: 50 Marks]

Answer all the questions

1. a) By which concepts of Object Oriented principle the following characteristics are achievable? (3 Marks)

i) Data Hiding

ii) Reusability

iii) ---------- represents the relationships between objects and classes.

b) Distinguish between Procedure Oriented Programming and Object Oriented Programming. (2 Marks)

2. Predict output for the following code segment with proper justification: (5 Marks)

```
public class Precedence {
  public static void main(String[] args) {
    System.out.println( 3 * 3 - 2 );
    System.out.println( 3 * 3 / 2 );
    System.out.println("--");
    System.out.println( 1 + 1 / 1 - 1);
    System.out.println( 3 * 3 / 2 + 2);
    System.out.println("--");
    int x = 1;
    System.out.println( x << 1 * 2 >> 1);
  }
}
```

3. a) What is the significance of "*this*" pointer? (2 Marks)

b) What is the significance of garbage collection? (1 Marks)

c) What is the difference between a static variable and an instance variable? (2 Mark)

4. For the scenario given below, Identify the classes (give class diagram) and represent them using association by identifying the cardinality and relationships among them. (5 Marks)

- Each Course object maintains a list of the students on that course and the lecturer who has been assigned to teach that course
- The Course object has behaviour that allow the adding and removing of students from the course, assigning a teacher, getting a list of the currently assigned students, and the currently assigned teacher.

- Teachers are modelled as Lecturer objects. As a lecturer may teach more than one course there is an association between Course and Lecturer. The "taughtBy" relationship shows that a Course only has a single teacher, but that a lecturer may teach several Courses.
- Each Lecturer object also maintains a list of the Courses that it teaches.
- There is a similar relationship between Course and Student. A course is attended by zero or more Students, and a Student may attend multiple courses.
- Both Lecturer and Student are shown to be types of Person.

5. Define a class called ***ClockTime*** with data members as hour, minute and second. The class should have a method to set the values of hour, minute and second and a second method to display time in "*hour: minute: second*" format. Also, define a method to check whether two time objects are same or not, by passing one ClockTime object as argument. The method returns true if the time is valid; otherwise it returns false. Write a complete program that shows the working of this class. (5 Marks)

6. a) Identify the object oriented Concept for the scenario given below.

i) Ink is the important component in pen but it is hiding by some other material.

ii) You have a Mobile Phone, you can dial a number using keypad buttons. Even you don't know how these are working internally.

iii) A software engineer performs many tasks such as sometimes he performs coding, sometimes he performs testing, and sometimes he performs analyzing (3 Marks)

b) Why is Java Architectural Neutral? (2 Marks)

7. Write a Java program to illustrate the Bank account transaction with the below given operations: (10 Marks)

i. Create a class "**BankAccount**"contains **custname**, **acctType**, **amount**, **custID**, **pin**, **and balance** as Data members from which **custID** and **pin** are constant members.

ii. Use **Constructor** to initialize the basic values of all the data members get it from the user.

iii. Ask the customer wish to perform the below functions:

a. **Deposit**: Validate the customer by their custID and pin. After successful validation, ask the customer to enter the amount to deposit and check that amount is valid (not negative values) if so, alert "Invalid Amount", otherwise increment the balance.

b. **Withdraw**: Validate the customer by their custID and pin.After successful validation, ask the customer to enter the amount to withdraw and check the balance with that. If the balance is less than the entered amount, then alert the customer "Insufficient Balance", otherwise, adjust the balance.

c. **InterestRate**: It is the static member function. Pass the acctType as an argument, For "SB" account (Savings Bank), the interest rate is 5.5%, for "CB" account (Current Account), there is no interest rate. Calculate the interest rate for the available balance and display it with split (Balance + Interest Rate).

d. **CustInfo**: Validate the customer by their custID and pin. After successful validation, display full details of the customer.

8. a) Give the output of the following program snippet. (3 Marks)

```
package myown;
public class student10 {
        int id;
          String name;
          student10 (int id,String name){
          id = id;
          name = name;  }
          void display(){System.out.println(id+" "+name);}
          public static void main(String args[]){
          student10 s1 = new student10(10,"RAMA");
          student10 s2 = new student10(32,"SITA");
          s1.display();
          s2.display();
          } }
```

b)

```
package myown;
  class jc {
    public static void main(String args[]) {
              int x = 2;
        int y = 0;
        for ( ; y < 10; ++y) {
          if (y % x == 0)
                    continue;
                else if (y == 8)
                    break;
                else
                  System.out.print(y + " ");
              }
           }
}
```

(2 Marks)

9. a) Establish the appropriate relationship (Association) between the below given classes and mention the association name and cardinality. (3 Marks)

b) Draw a sample UML class diagram which shows the Aggregation relationships. (2 Marks)

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