

THE OPEN UNIVERSITY OF SRI LANKA
DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING
DIPLOMA IN INFORMATION SYSTEMS & TECHNOLOGY
ECX3162 – INTRODUCTION TO OBJECT ORIENTED PROGRAMMING
FINAL EXAMINATION – 2014/2015



CLOSE BOOK TEST

Date: 11th of October 2015

Time: 09:30 – 12:30 hrs

INSTRUCTIONS TO CANDIDATE

Answer **Q1** and any three (3) questions from **Q2** to **Q6**

Q1 Compulsory Question [40 Marks]

WinR Company decided to reduce the manual workload of the human resources department and to deploy E-HRMS which is a new Human Resource Management System (HRMS) to track employee history, skills, abilities, salary and their accomplishments.

Each module of E-HRMS performs a separate function as given below.

- Payroll
- Database for employee information
- Attendance records
- Performance evaluation
- Learning and recruiting management
- Employee scheduling
- Tracking of employee absenteeism

Each employee of the company gets assigned a unique Employee No. The company holds employee personal information such as Full Name, Birth Day, Residential Address, Contact No etc and employee qualifications such as the highest level of exam sat, results, graduated institute, year etc. An employee is assigned to a division of the company. Attendance details of each employee are maintained at each division. Salary is calculated based on decided criteria of employee designation. This criteria accepts the allowances get paid for each employee, no. of no paid leave taken by the employee, no. of days attended by the employee, no. of hours the employee have worked overtime etc.

- a) Briefly explain the following concepts using only one statement for each.
- i. Class
 - ii. Object
 - iii. Attribute
 - iv. Behavior

[08 Marks]

- b) Write down 5 classes that you can identify from the given scenario. [05 Marks]
- c) Select a class from what you stated in part (b) and write down two attributes and two behaviors for the class. [04 Marks]
- d) Write a Java class for the selected class in part (c). Write down the Java codes to define the attributes and the behaviors. [15 Marks]
- e) Write a Java code snippet to create an object of the defined class. What happens when you create an object of a class? [08 Marks]

Q2 [20 Marks]

- a) Briefly explain the purpose of using an access specifier to designate the members of a class as private, protected and public. [06 Marks]
- b) Write a Java programme to get the given pattern as the output. Use loops wherever possible.

```

      *
    * *
  * * *
* * * *
* * * * *

```

[14 Marks]

Q3 [20 Marks]

- a) What is Java Virtual Machine? [04 Marks]
- b) State the reason to consider Java as a platform independent language [06 Marks]
- c) State two Object Oriented Programming languages apart from Java. [02 Marks]
- d) Compare and contrast Object Oriented Programming vs Structural Programming. [08 Marks]

Q4 [20 Marks]

a) Briefly explain the following concepts using maximum two statements for each.

- a. Encapsulation
- b. Inheritance
- c. Overriding
- d. Overloading

[08 Marks]

b) Give examples for each object oriented concepts explained in part (a) using a real world example.

[12 Marks]

Q5 [20 Marks]

Refer the given code snippet when answering the following questions.

```
class Animal{
    public void move(){
        System.out.println("Animals can move");
    }
}

class Dog extends Animal{
    public void move(){
        System.out.println("Dogs can walk and run");
    }
}

public class TestDog{
    public static void main(String args[]){
        Animal a = new Animal(); // Animal reference and object
        Animal b = new Dog(); // Animal reference but Dog object
        a.move();// runs the method in Animal class
        b.move();//Runs the method in Dog class
    }
}
```

a) The given code snippet implements polymorphism. State two types of polymorphism in Java.

[04 Marks]

b) What is the type of polymorphism implemented in the above code snippet?

[02 Marks]

c) Write the output of the given code snippet.

[04 Marks]

d) The meaning of the greek word polymorphism is “many shapes”. Briefly explain how polymorphism is achieved in the above code.

[10 Marks]

Q6 [20 Marks]

a) Briefly explain two advantages of using Inheritance in a program

[04 Marks]

b) Write the output of the following code snippet.

[04 Marks]

```
class A {
    int i;
    void display() {
        System.out.println(i);
    }
}
class B extends A {
    int j;
    void display() {
        System.out.println(j);
    }
}
class inheritance_demo {
    public static void main(String args[])
    {
        B obj = new B();
        obj.i=1;
        obj.j=2;
        obj.display();
    }
}
```

c) Distinguish the terms *Super Class* and *Sub class*.

[04 Marks]

d) Briefly explain the functionality of each statement inside the main method to generate the output at execution.

[08 Marks]