Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Industrial Information Technology Degree Programme
2nd Year 1st Semester Examination – August/September 2014
CST 221-2 Object Oriented Programming

Number of questions: Four (04)
Answer all questions
Time Allocation: Two (02) Hours
Total mark: 100

1. a. What is meant by platform independent language? Java is a platform independent language. Explain this statement. (05 mark)

   b. Define the following terms.
      i) Abstraction
      ii) Encapsulation (04 mark)

   c. Differentiate instance variable, class variable and local variable. (06 mark)

   d. Write simple java code segments to perform the following tasks.
      Note: Complete java program is not needed.

      i) Write a "while" loop that is equivalent to the following "for" statement.

```
for(int i=0, j=5; i<5, j>0; i++, j--){
        System.out.println( i+j); }
```

      ii) Write a "do ….. while" loop that is equivalent to the following "while" loop.

```
int i=0;
  while(++i<10){
   System.out.print(i + "*"); }
```

      iii) Using the conditional operator check if the given integer value is odd / even.

      iv) Write an infinite loop using a "for" statement.

      (08 mark)

2. a. What is meant by Polymorphism in Java? Explain how you could achieve Polymorphism. (04 mark)

b. It is required to write a program to manipulate employee information. Each employee is represented by number, name, date of birth, title and salary attributes. Write a class to represent employees. Your class must include a default constructor, overloaded constructor and a display method.

(06 mark)

c. Define an abstract class to represent employees stated in 2.b. Your class must use abstract methods to minimize the coding. (05 mark)

d. Derive two concrete classes, given in the following table, from the abstract class you defined in 2.c.

Class	Attributes	Methods
PermEmp	service_period bonus	display calculateBonus
TempEmp	no_of_days daily_payment	display calculateSalary

The calculateBonus method comptutes the bonus as follows:
Bonus = 10% of the salary for employees having more than 20 years of service.
Bonus = 5% of the salary for employees having more than 10 years of service.
Bonus = 1% of the salary for employees having more than 5 years of service.

The calculateSalary method calculates the salary as no_of_days*daily_payment and assigns it to the salary attribute. (10 mark)

e. Write a driver class to demonstrate how you use dynamic binding in Java. (03 mark)

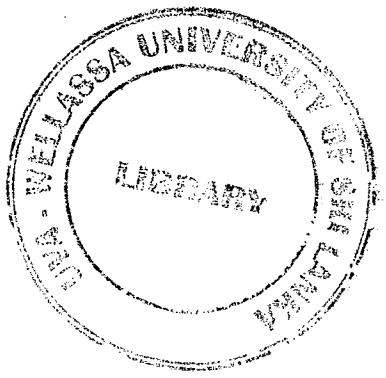
3. a. The following classes have several syntax errors. Write the corrected Java codes for the following classes.

i)
```
public class Code1{
public static void main (String args[]) {
   for(int i=0; j=0 : i<5 : i++; j=i*i)
      System.out.print(i+j);}
       }
}
```

ii)
```
public class Code2{
 public static void main (String args[]) {
 int i=0;
  do{
     i+;
   sum+=i
    }while(i<10)}
}
```

iii)
```
public class Code3{
      static method1(char[] c) {
      for(int i=1; i<c.len; i++){
           if(c[i]=='X')
                return true;
           else
                return false
  }
 }

 public static void main (String args[]) {
   char[] c={'A';'X'};
       System.out.println(method1(c));
 }
```



(03 mark)

b. Suppose you compile and run the above Java classes in 3.a after fixing syntax errors. What will be the final output of each of the above classes on the console?

(06 mark)

c. How does "final methods" differ from the other methods in Java? List two types of methods which implicitly become final at the creating stage. (05 mark)

d. State and describe three (03) categories of Java Exceptions with examples.

(09 mark)

4. a. Write the Java syntax for method declaration.
Define a method to calculate the minimum value of three numbers passed as arguments. (04 mark)

b. Declare two dimensional arrays called "Array1" and "Array2" with the following values.

Array1	**Array2**
5,3,5	5,3,5
1,4,0	1,4,0

i) Write a complete Java program called 'AddArray' which adds the above two arrays. (14 mark)

c. What is a Constructor? "You cannot create instances of a class, if you do not include a constructor method in the class definition". Discuss this statement. (04 mark)

d. Write the reasons for giving explicit calls to close the file in the program when handling I/O files in Java. (04 mark)