UNIVERSITY COLLEGE TATI

UNIVERSITY COLLEGE TATI (UCTATI)

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: BCS2233
COURSE	: OBJECT ORIENTED PROGRAMMING
SEMESTER/SESSION	: 1-2022/2023
DURATION	: 3 HOURS

Instructions:

1. This booklet contains 5 questions. Answer ALL questions.
2. All answers should be written in answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 10 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

a) Consider the following Java program in Figure 1.

```
import java.util.Scanner;
public class Main
{
 public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
      double ticketPrice;
    System.out.print("National Zoo of Malaysia. Please enter
your age: ");
      int age= input.nextInt();
      if (age >= 13)
        ticketPrice=80.00;
    else
       ticketPrice=45.50;

  System.out.printf ("Your Ticket Price is RM
%.2f",ticketPrice);
      }
}
```

Figure 1

i) Write the output for the program when input is 22. (2 marks)

ii) Write an algorithm (either pseudocode or flowchart) for the program in Figure 1. (4 marks)

b) The following java program (Figure 2) is to input parliament code and prints its names based on the Table1. Rewrite the program using `if-else-if` statement. (6 marks)

```
      import java.util.Scanner;
      public class Main{
        public static void main(String[] args) {
          Scanner input = new Scanner(System.in);
          int parliament_code;
          System.out.println("Please enter parliament code ");
          parliament_code = input.nextInt();

          switch(parliament_code)  {
           case 33:  System.out.println("Besut");
           break;
            case 36: System.out.println("Kuala Terengganu");
            break;
```

```
            case 37: System.out.println("Marang");
            break;
            case 40: System.out.println("Kemaman");
            break;
            default: System.out.println("Invalid Code");
          } //switch
      }
  }
```

Figure 2

Table 1

Parliament Code	Area Name
33	Besut
36	Kuala Terengganu
37	Marang
40	Kemaman

c) Loops can be controlled using several ways such as counter controlled, sentinel controlled and flag controlled. Differentiate counter controlled and sentinel controlled. (4 marks)

d) Write a Java code segment program to print even numbers from 10 to 20 (use loops). Here is sample output (Figure 3): (4 marks)

```
10 12 14 16 18 20
```

Figure 3

QUESTION 2

a) Find and correct **ONE (1)** error in the following Java program in Figure 4. (3 marks)

```
public class Main
{
    public static void main(String[] args) {
        ucap("Hello");
    }

    public static void ucap(){
        System.out.println("Selamat Datang");
    }
}
```

Figure 4

b) Consider the following program in Figure 5.

```
1  public class Main {
2  public static void main (String [] args){
3      System.out.println(methodMisteri(2.0,5.0));
4      }
5
6      public static double methodMisteri(double N1, double N2){
7          return N1*N2;
8      }
9
10     public static int methodMisteri(int N1, int N2){
11         return N1+N2;
12     }
13 }
14
```

Figure 5

i) Write the output for the program. (2 marks)

ii) Write the output for the program if the statement in line three (3) (2 marks)

```
System.out.println(methodMisteri (2.0,5.0));
```

is replaced with

```
System.out.println(methodMisteri (2,5));
```

iii) Identify whether the following method call is valid. Give a reason. (3 marks)

```
System.out.println(methodMisteri (2.0,5.0,3.0);
```

c) Write a method that returns `true` if the given integer is odd. Otherwise return `false`. Use the following method header: (5 marks)

```
public static boolean isOdd(int N)
```

d) Write a method that return a factorial of a given integer. The method header is given below. (5 marks)

```
public static int factorial(int N)
```

QUESTION 3

a) List and explain the **FOUR** (4) pillars of object-oriented programming. (12 marks)

i) Encapsulation
ii) Abstraction
iii) Inheritances
iv) Polymorphism

b) Consider the following Java Program in Figure 6.

```
class Cat {
    String name;
    int age;
    String color;
    String breed;

    void sleep(){
        System.out.print(" Sleeping ");
    }
    void play(){
        System.out.print(" Playing ");
    }
    void feed(){
        System.out.print(" Eating ");
    }
}
public class Main {
    public static void main(String[] args) {
        Cat bulus = new Cat();
        Cat manja = new Cat();

        bulus.name = "Bulus";
        bulus.age = 3;
        bulus.breed = "Siamese Cat";
        bulus.color = "Brown";
        System.out.print(bulus.name);
        bulus.sleep();

        manja.name = "Manja";
        manja.age = 4;
        manja.breed = "Kampung";
        manja.color = "Black";
        System.out.print(manja.name);
        manja.play();
    }
}
```

Figure 6

i) Write the output for the program. (3 marks)

ii) Draw the UML Diagram for the Class and Object. (5 marks)

QUESTION 4

Design a class named `CellPhones` to represent a cell phones. The class contains: (15 marks)

i) A private string data fields named `manufact` field that specify the phone's manufacturer.
ii) A private Integer data field named `model` that that specify the phone's model number.
iii) A private double data field named `retailPrice` that specify phone's retail price.

The class will also have the following methods:

i) A `constructor` that accept arguments for manufacturer, model number, and retail price.
ii) A `getManufact` method that returns the phone's manufacturer.
iii) A `getModel` method that returns the phone's model number.
iv) A `getRetailPrice` method that returns the phone's retail price

The UML class diagram for cellPhone is given as follows (Figure 7).

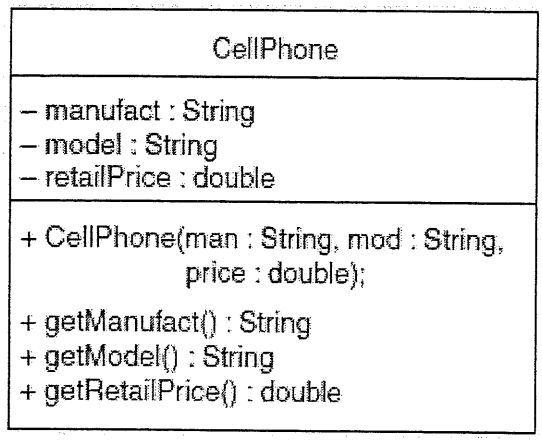

Figure 7

QUESTION 5

Use the following java program in Figure 8 to support your answer in the following question a), b), c), d) and e).

```
class rectangle {
    int length, height;

    double getArea(){
        return (length*height);
    }
}

class cuboid extends rectangle{
    int width;

    double getArea(){
     return (width*(super.getArea()));
    }
}
public class Main{
     public static void main(String[] args) {
          rectangle Rec= new rectangle();
          cuboid Cub = new cuboid();
          Rec.length=2;
          Rec.height=3;
          System.out.println("Rectangle");
          System.out.println("Length :"+Rec.length);
          System.out.println("Height :"+Rec.height);
          System.out.println("Area :"+Rec.getArea());

          Cub.length=5;
          Cub.height=6;
          Cub.width=2;
          System.out.println("Cuboid");
          System.out.println("Length :"+Cub.length);
          System.out.println("Height :"+Cub.height);
          System.out.println("Width :"+Cub.width);
          System.out.println("Area :"+Cub.getArea());
     }
}
```

Figure 8

a) Write the output for the program. (3 marks)

b) List all classes and objects defined in the program. (2 marks)

c) Explain inheritance and code reusability. (5 marks)

d) Explain superclass and derived class. (5 marks)

e) Explain method overriding. (5 marks)

f) Explain super keyword. (5 marks)

----------End of question----------