CSC 2000 – COMPUTER PROGRAMMING

Test 1

Instructions

1. There are two sections in this paper. Answer **all** the questions
2. Write your answers on a separate answer sheet
3. The test is for two(2) hours

SECTION A [40 Marks]

Answer all questions in this section.

1. Explain the following concepts; [6 Marks]
   a) Object oriented programming [1 Marks]
   b) Variable hiding [1 Marks]
   c) Variable [1 Marks]
   d) Class [1 Marks]
   e) Object [1 Marks]
   f) Constructor [1 Marks]

2. Analyze the following piece of code and answer the questions that follows [6 marks]

```
public class a{
   int number;
   public a(int number){
     number = 5;
   }
   public void printNumber()
     system.out.println(number);
  }

}//end class a

public class B{

    public static void main(Strings args[]){
      a a1 = new a(4);
      a a2 = new a(5);

     a1.printNumber();
     a2.printNumber();
    }

}//end class B
```

   i. Identify all the unique keywords from the code above [2 Marks]
   ii. Identify all the compilation errors from the above code [2 Marks]

iii. What is the output of the above code when it runs [2 Marks]

3. What is the output of the following code extract [2 Marks]

```
for(int i=0; i<10; i=i+2){
    System.out.println(i);
    i--;
}
```

4. What is the following piece of code going to print? [2 Marks]

```
while(true){
    int i = 0;
    if( i == 5){
      break;
    }
    System.out.println(i);
    I++;
}
```

5. Analyze the following java code and answer the questions given [12 Marks]

```
Public class Class{
    private int n;
    private double m;
    String k;
    public Class(){
    }
    void a(){
    }
    private int b(){
    }
}//end class Class
```

i. Identify all the errors in the above code [2 Marks]
ii. Identify all the attributes in the above code. For each attribute identified, state the access modifier and whether the data type is primitive or reference [6 Marks]
iii. Identify all the methods in the above code. For each method identified, state the access modifier and the return type [4 Marks]

6. What is the output of the following code extract? [2 Marks]

```
int i= 3;
long j = i;
double k = j;
byte x = (byte)k;
System.out.println(i);
System.out.println(j);
System.out.println(k);
System.out.println(x);
```

7. Analyze the java code below and answer the questions below. [6 Marks]

```
public class User-Account{
  public void main(String args[]){
    private int I = 9;
    private double k = 8;
    System.out.println(I);
    System.out.println(k);
  }
```

   i. Identify all the compilation errors in the above code [4 Marks]
   ii. Assuming that all compilation errors are fixed, will the above code run? [2 Marks]

8. What is the output of the following code extract? [2 Marks]

```
double mark = 86.6;
if(mark >= 90 || mark <= 100){
  System.out.println("A+");
}else if(mark >= 80 || mark < 90){
  System.out.println("A");
}else{
  System.out.println("D");
}
```

9. What is the piece of code below printing? [2 Marks]

```
do{
  int i=0;
  System.out.println(i);
  I++;
}while(i<10);
```

SECTION B [60 Marks]

Answer the question below.

The **body mass index (BMI)** is a measure of relative weight based on an individual's mass and height.

Devised between 1830 and 1850 by the Belgian polymath Adolphe Quetelet during the course of developing "social physics", it is defined as the individual's body mass divided by the square of their height – with the value universally being given in units of kg/m^2.

$$\mathrm{BMI} = \frac{\mathrm{mass(kg)}}{(\mathrm{height(m)})^2}$$

1. If the BMI is less than 0.5, then the person is obese
2. If the BMI is between 1 and 0.5 the person is health
3. If the BMI is above 1 then person is underweight

Write a java program that prompts a user to enter the mass and the height from the command line. Your program must read the mass and height, calculate the BMI and print obese or health or underweight.

Hint:

1. Use the Scanner Class to prompt the user for mass and height
2. Chose the appropriate data types to hold height, mass and BMI