(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS
YEAR TWO SEMESTER TWO EXAMINATIONS

FOR THE DIPLOMA IN
(INFORMATION TECHNOLOGY)

COURSE CODE   :   DIT 077

COURSE TITLE   :   OBJECT ORIENTED
PROGRAMMING

DATE: 07/09/2022   TIME: 2.00 P.M. - 4.00 P.M.

INSTRUCTIONS TO CANDIDATES

Answer Questions ONE and ANY OTHER TWO.

QUESTION ONE (COMPULSORY) [24 MARKS]

a) Consider a class definition called Cone below:

```
public class Cone {
    private double radius;
    private double slant_height;
}
```

i.   Write an appropriate set method that will initialize the values of radius and slant height to new values.   **[2 marks]**

ii.   Write a valid constructor that will initialize the values of radius to 0.00 and slant height to 0.00.   **[2 marks]**

iii. If you were to capture the value of radius and slant height from the keyboard, using the appropriate classes and import statement, write the appropriate java code excerpt to implement this.   **[3 marks]**

iv.   Write a java statement that would be used in the main method to create two objects and pass dummy values of radius=14, slant_height=20 and radius=7.00 and slant_height=15.00 respectively.   **[4 marks]**

b) What is the difference between a super class and a sub class?   **[2 marks]**

c) Define each of the following Java terms: **[3 marks]**
   i.   *Class*
   ii.   *Object*
   iii. *Method*

d) We can overload a method and a constructor. Explain how these happens in Java using a code excerpt.   **[2 marks]**

e) Explain what happens to a class and a method when declared:

   i.   final   **[2 marks]**

   ii.   protected   **[2 marks]**

   iii. abstract   **[2 marks]**

QUESTION TWO [18 MARKS]

a) Discus the characteristics of object-oriented programming.   **[6 marks]**

b) Using appropriate examples, explain the key differences between the following scopes of variables.   **[6 marks]**

i. Local variables
ii. Class variables
iii. Instance variables

c) State the various components that qualify to be called identifiers in Java. **[4 marks]**

d) Briefly explain the role of Java Virtual Machine and why it makes Java different from other high-level languages. **[2 marks]**

QUESTION THREE [18 MARKS]

a) Consider the code below:

```
Int key=1;
Switch (key+1)
{
case 1:
system.out.println("Apples");
Break;
case 2:
System.out.println("Oranges");
Break;
Case 3:
System.out.println("Peaches")
Break;
Case 4:
System.out.println("Plums");
Break;
Default
System.out.println("Fruitless");

}
```

What is the output produced by the above code. **[2 mark]**
b) Identify three mistakes in the program above. **[3 marks]**
c) What would be the output if the first line were changed to the following? **[4marks]**
   i. int key=3;
   ii. int key=5;
d) Mention three types of loops in java. **[3 marks]**
e) Discuss any three features that any object oriented programming language should have. **[6 marks]**
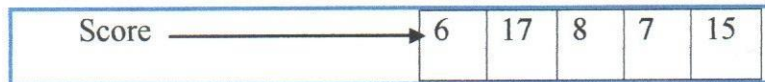
QUESTION FOUR [18 MARKS]
a) You are given the following student details: regNo, name and program. Methods getStudentRegNo() that returns a String, getStudentName() that returns a String, a method

getProgram() that returns a program as a String, a default constructor that initializes regNo, name and program to default values and a parameterized constructor that initializes the regNo, name and program to new values other than the default values. You are also given a method setRegNo() that takes one parameter, a method setName() that takes one parameter and a method setProgram() that takes one argument of type String. Required:

     i. Draw a UML diagram to model the scenario. **[6 marks]**

    ii. Write a java program to implement the UML diagram in i) above. **[6 marks]**

   iii. Write a driver class to test the capability of the class above. **[6 marks]**

QUESTION FIVE [18 MARKS]

a) You are given the following data elements in a computer memory as in table 1.

Score ⟶	6	17	8	7	15

i. Write a java statement to initialize the above array data structure   **[3 marks]**

ii. Write a code that would compute the total score and the mean score of the array.

    [6 marks]

iii. Simulate the output of the program below: Explain your answer   **[4 marks]**

```
public class ArrayDemo {
 public static void main(String[] args)
 {
     int score[]= new int [5];
     score[1]=17;
     score[4]=15;
     System.out.println(score[0]+score[2]+score[5]);
 }
}
```

b)   Explain using sample code the basic structure of a java program.   **[5 marks]**