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**KENYA METHODIST UNIVERSITY**

**END OF FIRST TRIMESTER 2018 (FT) EXAMINATIONS**

**SCHOOL : SCIENCE AND TECHNOLOGY**

**DEPARTMENT : COMPUTER SCIENCE**

**COURSE CODE : BBIT-223/CISY 210**

**COURSE TITLE : OBJECT ORIENTED PROGRAMMING**

**TIME : 2 HOURS**

**INSTRUCTIONS:**

* *Answer* ***Question ONE*** *and any other* ***TWO*** *Questions.*

**Question One**

1. Define the following terms (2 Marks)
2. Class
3. Method overriding
4. The following program has 8 errors. Identify these errors, indicating the lines that have these errors. (8 Marks)

 1 publicclassFullTimeExam
 2 {
 3 String name;
 4
 5 FullTime(String n);
 6 {
 7 name == n;
 8 }
 9
10 String printname()
11 {
12 String surname = "KeMU";
13 String s = name + surname;
14 return;
15 }
16
17 publicstaticvoid main(String)
18 {
19 FullTimeExamft = FullTimeExam();
20 printname();
21 }
22
23 }

1. If we save the program in b as FT.java would this be correct? Give a reason for your answer. (2 Marks)
2. What will the following segment of a program output? (4 Marks)

 5 int x = 30;
 6 do
 7 {
 8 if(x%3==0 && x%2==0)
 9 {
10 System.out.println(x);
11 }
12 x--;
13
14 } while(x>1);

1. Write only the segment of code (not the whole program) that outputs values from just the second column of the array below. Assume that the array is named *myarray.*  (4 Marks)

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 |

1. If in the program in b) we add another method with the heading *String printname(String s),* what OOP feature would we be implementing and what is its advantage? (3 Marks)
2. Interfaces provide a unique capability that overcomes the fact that Java does not support multiple inheritance. What is this capability? (2 Marks)
3. Assume that you were to write a program where you read values from an array. What kind of exception are you likely to encounter and how would you mitigate this in Java programming? (3 Marks)
4. Java is a multi-threaded language. Explain this statement. (2 Marks)

**Questions Two**

**Syntax, IO, Loops and Arrays**

1. The following program segment has 4 errors. Identify these errors and indicate how to correct them. (8 Marks)

 1 publicclass ErrorArray2
 2 {
 3 publicstaticvoid main(String arg[])
 4 {
 5 int[] myarray = newint[2][3];
 6 int x = 1;
 7
 8 for(int i=0; i >2; i++)
 9 {
10 for(int j = 0; j < 3; j++)
11 {
12 myarray[i][j] = x;
13 x++;
14 }
15
16 }
17
18
19 for(int i=0; i <2; i+)
20 {
21 for(j = 0; j < 3; j++)
22 {
23 System.out.println(myarray[i][j]);
24
25 }
26
27 }
28 }
29 }

1. Assume that you have a file named exams.txt that has names and ages of people in the classroom. Your task is to extract only the names of the students, as well as count the number of students in the classroom. Write the segment of code (you do not need to write the whole program) that performs this operation. (8 Marks)

**Question Three**

**Classes, Methods, Inheritance**

1. Indicate whether the following statements are true or false: (3 Marks)
2. A constructor can have a data type.
3. You can have two methods in the same class with the same name and the same number and type of parameters.
4. A subclass cannot inherit more than one superclass.

1. Consider that we wish to store the ages of 5 of our employees in an array and then output only the ages that are even numbers.
2. Write an array method, *myages,* that uses the Scanner class to accept the input using a for-loop and returns the array. (4 Marks)
3. Write a void method, *output,* that outputs the ages that are even numbers. (3 Marks)

You do not need to write the whole program and you can only write the two methods. Assume that the Scanner object is *src.*

1. Using an example of a method *sum(int x, int y)* explain method overriding. (5 Marks)

**Question Four**

**Abstract Classes, Interfaces, Exception Handling, Multithreading**

1. Why can’t abstract classes be instantiated? (2 Marks)
2. Consider the interface below. Write a program that implements this interface. (5 Marks)

public interface MyInterface

 {

public String myName(String s);

public void printName();

 }

1. Describe the three types of Exceptions, giving an example in each. (6 Marks)
2. Threads can be implemented in two ways. Which are these two ways?

 (2 Marks)