



KENYA METHODIST UNIVERSITY

END OF 1ST TRIMESTER 2010 EXAMINATIONS

FACULTY : **COMPUTING AND INFORMATICS**
DEPARTMENT : **COMPUTER INFORMATION SYSTEMS**
UNIT CODE : **CISY 111/BBIT 212**
UNIT TITLE : **OBJECT ORIENTED PROGRAMMING**
TIME : **2 HOURS**

Instructions:

- Answer question 1 and any other 2 questions.

Question 1 (30 marks)

- a) Define the following terms; (3 mks)
- Constructor
 - Multithreading
 - Exception
- b) Determine the value of the variables in the following statement after the calculation is performed. Assume that when the statement begins executing, all variables are type int and have the value 5.

Product * = x ++ (2 mks)

- c) Write a complete java application to prompt the user for the double radius of a sphere, and call method sphere volume to calculate and display the volume of the sphere. Use the following statement to calculate the volume:

double volume = (4.0/3.0) *math.Pi*math.pow(radius, 3) (10 mks)

- d) Determine whether each statement is true or false. If false, explain why. (3 mks)
- A java exception is an instance of a class derived from throwable.
 - In java, a higher priority runnable thread should preempt threads of lower priority.
 - When a subclass redefines a superclass method by using the same signature, the subclass is said to overload that superclass method.
- e) State two rules that must be considered in creating abstract classes. (2 mks)
- f) Differentiate between interfaces and abstract classes. (2 mks)
- g) Java defines two ways in which you can create a runnable object.
- State these two ways. (2 mks)
 - Name any two methods used to implement runnable objects. (2 mks)

- h) Occasionally, you may want some code to be executed regardless of whether an exception occurs or is caught. Java has a finally clause that can be used to accomplish this objective. Write down the syntax for the finally clause. (4 mks)

Question 2 (15 marks)

Write a program that uses a method called `palindrome ()` to determine if a 4 digit number input by the user is a palindrome or not. For example 1221 is a palindrome since it can be read the same way forwards and backwards. This program should also determine whether or not the number entered is four digits, if not, the program should give the user a chance to enter the number again. Use input and output dialogue boxes. (15 marks)

Question 3 (15 marks)

- a) When a subclass method overrides a superclass method, the superclass method can be accessed from the subclass if the superclass method name is preceded by a keyword and a separator. What are the keyword and the separator? (2 mks)
- b) Explain;
- i) The purpose of a method parameter (1 mk)
- ii) The difference between a parameter and an argument. (2 mks)
- c) Identify and correct the errors in each of the following sets of code: (10 mks)

i.

```
while ( c <= 5 )
{
    product *= c;
    ++c;
```

ii.

```
if ( gender == 1 )
    System.out.println( "Woman" );
else;
    System.out.println( "Man" );
```

iii.

```
final int ARRAY_SIZE = 5;
ARRAY_SIZE = 10;
```

iv.

```
Assume int b[] = new int [ 10 ];
for ( int i = 0; i <= b.length; i++ )
    b[ i ] = 1;
```

v.

```
Assume int a[][] = { { 1, 2 }, { 3, 4 } };
a[ 1, 1 ] = 5;
```

Question 4 (15 marks)

- a) Design a class named `Person` and its two subclasses named `student` and `Employee`. Make `Faculty` and `Staff` subclasses of `Employee`. A person has a name, address, phone number, and email address. A student has a subclass status (freshman, sophomore, junior or senior). Define the status as a constant. An employee has an office, salary and date-hired. A faculty member has office hours and a rank.

A staff member has a title. Override the `toString` method in each class to display the class name and the person's name. Implement the `toString` subclass. Write a test program that creates a `Person`, `Student`, `Employee`, `Faculty`, and `Staff` and invokes their `toString` methods.