Instruction to students:

1. You should attempt 25 out of the 30 MCQ questions. Answer for the multiple choice questions should be written in the next table. Each Point [2 Mark] [Total 50]

2. The exam paper is 5 pages long.

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Answer 25 Questions from the following questions:

1. Object-oriented programming allows you to derive new classes from existing classes. This is called ___________.
   - A. encapsulation
   - B. inheritance
   - C. abstraction
   - D. generalization

2. Which of the following statements are true?
   - A. To override a method, the method must be defined in the subclass using the same signature and compatible return type as in its superclass.
   - B. Overloading a method is to provide more than one method with the same name but with different signatures to distinguish them.
   - C. It is a compilation error if two methods differ only in return type in the same class.
   - D. A private method cannot be overridden. If a method defined in a subclass is private in its superclass, the two methods are completely unrelated.
   - E. A static method cannot be overridden. If a static method defined in the superclass is redefined in a subclass, the method defined in the superclass is hidden.

3. Which of the following statements are true?
   - A. A method can be overloaded in the same class.
   - B. A method can be overridden in the same class.
   - C. If a method overloads another method, these two methods must have the same signature.
   - D. If a method overrides another method, these two methods must have the same signature.
   - E. A method in a subclass can overload a method in the superclass.

4. Given the following code, find the compile error?
   ```java
   public class Test {
       public static void main(String[] args) {
   ```
m(new GraduateStudent());
m(new Student());
m(new Person());
m(new Object());
}
public static void m(Student x) {
    System.out.println(x.toString());
}
}
class GraduateStudent extends Student {
}
class Student extends Person {
    public String toString() {
        return "Student";
    }
}
class Person extends Object {
    public String toString() {
        return "Person";
    }
}

A. m(new GraduateStudent()) causes an error  B. m(new Student()) causes an error
C. m(new Person()) causes an error  D. m(new Object()) causes an error

5 The visibility of these modifiers increases in this order:
A. private, protected, none (if no modifier is used), and public.
B. private, none (if no modifier is used), protected, and public.
C. none (if no modifier is used), private, protected, and public.
D. none (if no modifier is used), protected, private, and public.

6 Encapsulation means ______________.
A. that data fields should be declared private.
B. that a class can extend another class.
C. that a variable of supertype can refer to a subtype object.
D. that a class can contain another class.

7 Composition means ______________.
A. that data fields should be declared private.
B. that a class can extend another class.
C. that a variable of supertype can refer to a subtype object.
D. that a class can contain another class.

8 Analyze the following code:
Circle c = new Circle (5);
Cylinder c = cy;
A. The code has a compile error.  B. The code has a runtime error.  C. The code is fine.

9 Analyze the following code:
public class Test extends A {
    public static void main(String[] args) {
        Test t = new Test();
t.print();
    }
}
class A {
    String s;
    A(String s) {
        this.s = s;
    }
public void print() {

System.out.println(s);
}
}

A. The program does not compile because Test does not have a default constructor Test().
B. The program has an implicit default constructor Test(), but it cannot be compiled, because its super class does not have a default constructor. The program would compile if the constructor in the class A were removed.
C. The program would compile if a default constructor A(){} is added to class A explicitly.
D. The program compiles, but it has a runtime error due to the conflict on the method name print.

10 What is the printout for the first statement in the main method?
public class Foo {
    static int i = 0;
    static int j = 0;
    public static void main(String[] args) {
        int i = 2;
        int k = 3;
        {
            int j = 3;
            System.out.println("i + j is " + i + j);
        }
        k = i + j;
        System.out.println("k is " + k);
        System.out.println("j is " + j);
    }
}

A. i + j is 5
B. i + j is 6
C. i + j is 22
D. i + j is 23

11 Which of the following can be placed in the blank line in the following code?
public class Test {
    private int id;
    public void m1() {
        _.id = 45;
    }
}

A. this
B. Test

12 You can declare two variables with the same name in __________.
A. a method one as a formal parameter and the other as a local variable
B. a block
C. two nested blocks in a method (two nested blocks means one being inside the other)
D. different methods in a class

13 ______ is a construct that defines objects of the same type.
A. A class
B. An object
C. A method
D. A data field

14 Which of the following statements are true?
A. A default constructor is provided automatically if no constructors are explicitly declared in the class.
B. At least one constructor must always be defined explicitly.
C. Every class has a default constructor.
D. The default constructor is a no-arg constructor.

15 What is wrong in the following code?
class TempClass {
    int i;
    public void TempClass(int j) {
int i = j;
}
}
public class C {
public static void main(String[] args) {
TempClass temp = new TempClass(2);
}
}

A. The program has a compilation error because TempClass does not have a default constructor.
B. The program has a compilation error because TempClass does not have a constructor with an int argument.
C. The program compiles fine, but it does not run because class C is not public.
D. The program compiles and runs fine.

16 Given the declaration Circle x = new Circle(), which of the following statement is most accurate.
A. x contains an int value.
B. x contains an object of the Circle type.
C. x contains a reference to a Circle object.
D. You can assign an int value to x.

17 Which of the following statement is most accurate?
A. A reference variable is an object.
B. A reference variable refers to an object.
C. An object may contain other objects.
D. An object may contain the references of other objects.

18 Variables that are shared by every instances of a class are __________.
A. public variables
B. private variables
C. instance variables
D. class variables

19 Analyze the following code:
public class Test {
private int t;
public static void main(String[] args) {
int x;
System.out.println(t);
}
}
A. The variable t is not initialized and therefore causes errors.
B. The variable t is private and therefore cannot be accessed in the main method.
C. t is non-static and it cannot be referenced in a static context in the main method.
D. The variable x is not initialized and therefore causes errors.
E. The program compiles and runs fine.

20 Which of the following statements are true?
A. Use the private modifier to encapsulate data fields.
B. Encapsulating data fields makes the program easy to maintain.
C. Encapsulating data fields makes the program short.
D. Encapsulating data fields helps prevent programming errors.

21 When invoking a method with an object argument, __________ is passed.
A. the contents of the object
B. a copy of the object
C. the reference of the object
D. the object is copied, then the reference of the copied object
22 When you create an array using the following statement, the element values are automatically initialized to 0.

```java
int[][] matrix = new int[5][ ];
```

A. True  B. False

23 The following program displays ________.

```java
public class Test {
    public static void main(String[] args) {
        String s = "Java";
        StringBuilder buffer = new StringBuilder(s);
        change(s);
        System.out.println(s);
    }
    private static void change(String s) {
        s = s + " and HTML";
    }
}
```

A. Java  B. Java and HTML  C. and HTML  D. nothing is displayed

24 Which class do you use to write data into a text file?

A. File  B. PrintWriter  C. Scanner  D. System

25 The signature of a method consists of ________.

A. method name  B. method name and parameter list  C. return type, method name, and parameter list  D. parameter list

26 When you invoke a method with a parameter, the value of the argument is passed to the parameter. This is referred to as ________.

A. method invocation  B. pass by value  C. pass by reference  D. pass by name

27 The client can use a method without knowing how it is implemented. The details of the implementation are encapsulated in the method and hidden from the client who invokes the method. This is known as ________.

A. information hiding  B. encapsulation  C. method hiding  D. simplifying method

28 Which of the following statements is valid?

A. int i = new int(30);  B. double d[] = new double[30];  C. int[] i = {3, 4, 3, 2};  D. char[] c = new char();  E. char[] c = new char[4]{'a', 'b', 'c', 'd'};

29 When you return an array from a method, the method returns ________.

A. a copy of the array  B. a copy of the first element  C. the reference of the array  D. the length of the array

30 Which of the following is a valid identifier?

A. $343  B. class  C. 9X  D. 8+9  E. radius

Good Luck …