Exam
Name___________________________________

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Suppose s1 and s2 are two strings. What is the result of
   s1.equals(s2) == s2.equals(s1)
   A) true  B) false

2) _______ returns a string. (choose all that apply)
   A) String.valueOf(new char[]{'a', 'b', 'c'})
   B) String.valueOf(12.53)
   C) String.valueOf(false)
   D) String.valueOf(123)
   E) String.copyValueOf(new char[]{'a', 'b', 'c'})

3) Assume s is " abc ", the method ______ returns a new string "abc".
   A) s.trim(s)  B) String.trim(s)  C) trim(s)  D) s.trim()

4) Given the following program:

    public class Test {
        public static void main(String[] args) {
            for (int i = 0; i < args.length; i++) {
                System.out.print(args[i] + " ");
            }
        }
    }

    What is the output, if you run the program using

    java Test 1 2 3

    A) 1  B) 3  C) 1 2 3  D) 1 2
5) What is the output of the following code?

```java
class Test {
    public static void main(String[] args) {
        String s1 = "Welcome to Java!";
        String s2 = s1;

        if (s1 == s2)
            System.out.println("s1 and s2 reference to the same String object");
        else
            System.out.println("s1 and s2 reference to different String objects");
    }
}
```

A) s1 and s2 reference to different String objects
B) s1 and s2 reference to the same String object

6) Which of the following statements are incorrect? (choose all that apply)

A) String s = 'r';       B) int k = null;       C) float f = 4.5;       D) char c = "r";

7) Which of the following statements is preferred to create a string "Welcome to Java"?

A) String s; s = "Welcome to Java";
B) String s = new String("Welcome to Java");
C) String s = "Welcome to Java";
D) String s; s = new String("Welcome to Java");

8) _______ can be accessed from any static method in the class.

A) A static variable       B) An instance variable       C) A local variable

9) You can declare two variables with the same name in _______.

A) a block
B) two nested blocks in a method (two nested blocks means one being inside the other)
C) different methods in a class
D) a method one as a formal parameter and the other as a local variable

10) The internal state of an immutable class cannot be changed. String is an immutable class.

A) true       B) false
11) Analyze the following code:

class Test {
    private double i;

    public Test(double i) {
        this.t();
        this.i = i;
    }

    public Test() {
        System.out.println("Default constructor");
        this(1);
    }

    public void t() {
        System.out.println("Invoking t");
    }
}

(choose all that apply)
A) this.i may be replaced by i.
B) this(1) must be replaced by this(1.0).
C) this(1) must be called before System.out.println("Default constructor").
D) this.t() may be replaced by t().

12) Analyze the following code:

class Circle {
    private double radius;

    public Circle(double radius) {
        radius = radius;
    }
}

A) The program does not compile because Circle does not have a default constructor.
B) The program has a compilation error because it does not have a main method.
C) The program has a compilation error because you cannot assign radius to radius.
D) The program will compile, but you cannot create an object of Circle with a specified radius. The object will always have radius 0.

13) _______ can be accessed from any instance method in the class. (choose all that apply)
A) A static variable
B) A local variable
C) An instance variable

14) If a method is declared private in the superclass, you may declare the method public in the subclass.
A) true
B) false
15) Which of the following classes cannot be extended?
   A) class A { protected A();}   B) final class A {
   C) class A { private A();}   D) class A {

16) If an object is an instance of class A, and class A is a subclass of class B, then the object is also an instance of class B.
   A) true   B) false

17) Invoking ________ returns the number of the elements in an ArrayList x.
   A) x.size()   B) x.getLength()   C) x.getSize()   D) x.length()

18) What modifier should you use on the members of a class so that they are not accessible to another class in a different package, but are accessible to any subclasses in any package?
   A) protected   B) public   C) private   D) Use the default modifier.

19) Which of the following classes are immutable? (choose all that apply)
   A) String
   B) Double
   C) BigInteger
   D) Integer
   E) BigDecimal

20) Which of the following statements regarding abstract methods are true? (choose all that apply)
   A) It is possible to declare an abstract class that contains no abstract methods.
   B) A data field can be declared abstract.
   C) A class that contains abstract methods must be abstract.
   D) An abstract method cannot be contained in a nonabstract class.
   E) Abstract classes have constructors.

21) A subclass of a non-abstract class must be non-abstract.
   A) true   B) false
22) Analyze the following code.

```java
public class Test {
    public static void main(String[] args) {
        Number x = new Integer(3);
        System.out.println(x.intValue());
        System.out.println((Integer)x.compareTo(new Integer(4)));
    }
}
```

A) The program has a syntax error because `x` cannot be cast into `Integer`.
B) The program has a syntax error because an `Integer` instance cannot be assigned to a `Number` variable.
C) The program has a syntax error because `intValue` is an abstract method in `Number`.
D) The program compiles and runs fine.
E) The program has a syntax error because the member access operator (.) is executed before the casting operator.

23) ______ is to identify the classes and discover the relationships among these classes.

   A) Coding  
   B) Requirements specification  
   C) Designing classes  
   D) Testing

24) Which of the following statements are true? (choose all that apply)

   A) Override the methods `equals` and `toString` defined in the `Object` class whenever possible.
   B) Override the `hashCode` method whenever the `equals` method is overridden. By contract, two equal objects must have the same hash code.
   C) A public default no-arg constructor is assumed if no constructors are defined explicitly.
   D) You should follow standard Java programming style and naming conventions. Choose informative names for classes, data fields, and methods.

25) If a parameter is of the `Object` type, you can pass any object to it. This is known as generic programming.

   A) true  
   B) false

26) ______ is a general binary relationship that describes an activity between two objects.

   A) Composition  
   B) Association  
   C) Inheritance  
   D) Aggregation

27) Which layout manager should you use to place GUI components in a row from left to right.

   A) `FlowLayout`  
   B) `CardLayout`  
   C) `BorderLayout`  
   D) `GridLayout`

28) ______ are referred to as heavyweight components.

   A) AWT components  
   B) Swing components  
   C) GUI components  
   D) Non-GUI components
29) Which color is the darkest?
   A) new Color(20, 0, 0)
   B) new Color(10, 0, 0)
   C) new Color(30, 0, 0)
   D) new Color(0, 0, 0)
   E) f.setForeGround(Color.yellow)

30) To repaint graphics, invoke ______ on a Swing component.
   A) repaint()
   B) update()
   C) paintComponent()
   D) init()

31) Suppose a button jbt is placed in a frame, the coordinate of the button within the content pane of the frame is ______.
   A) (0, 0)
   B) (jbt.x, jbt.y)
   C) cannot be obtained
   D) (jbt.getX(), jbt.getY())

32) You can draw things on a panel.
   A) true
   B) false

33) "abcdefgh".substring(1, 3) returns ______.
   A) abc
   B) cde
   C) bcd
   D) bc

34) Assume s is "ABCABC", the method ______ returns an array of characters.
   A) toChars(s)
   B) String.toChars()
   C) s.toCharArray()
   D) s.toChars()
   E) String.toCharArray()

35) Java uses ______ to reference the current object.
   A) this
   B) null
   C) thisObject
   D) that
36) What is the printout for the third statement in the main method?

```java
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) j is 3  
B) j is 2  
C) j is 0  
D) j is 1

37) In OOP, a reference variable can reference to several type of objects. This is called ________.

A) inheritance  
B) abstraction  
C) polymorphism  
D) encapsulation

38) What is the output of the following code:

```java
public class Test {
    public static void main(String[] args) {
        String s1 = new String("Java");
        String s2 = new String("Java");
        System.out.print((s1 == s2) + " " + (s1.equals(s2)));
    }
}
```

A) true true  
B) false true  
C) true false  
D) false false

39) You cannot create an instance of an abstract class using the new operator.

A) true  
B) false

40) What is the best suitable relationship between Company and Employee?

A) Aggregation  
B) None  
C) Inheritance  
D) Association

41) The method ________ sets the font (Helvetica, 20-point bold) in component C.

A) c.setFont(new Font("Helvetica", Font.BOLD, 20))
B) c.setFont(new Font("Helvetica", Font.bold, 20))
C) c.setFont(Font("Helvetica", Font.BOLD, 20))
D) c.setFont(new Font("helvetica", BOLD, 20))
42) The following are the methods to obtain font properties in a FontMetrics object fm. (choose all that apply)
   A) fm.getDescent()          B) fm.getLeading()
   C) fm.getHeight()           D) fm.getAscent()

43) Which of the following statements are correct to concatenate string s1 into s2. (choose all that apply)
   A) s1.concatenate(s2);       B) s1 += s2;
   C) s2.concatenate(s1);      D) s2 += s1;

44) A constructor can access __________. (choose all that apply)
   A) A static variable       B) A public instance variable
   C) A local variable defined in any method D) A private instance variable

45) If a method is declared public in the superclass, you may declare the method private in the subclass.
   A) true                      B) false

46) Suppose A is an interface, B is a concrete class with a default constructor that implements
    (choose all that apply)
   A) B b = new B();           B) A a = new A();
   C) B b = new A();           D) A a = new B();

47) An aggregation relationship is usually represented as __________ in __________.
    A) a method/the aggregated class B) a method/the aggregating class
    C) a data field/the aggregated class D) a data field/the aggregating class

48) A panel can be placed inside a panel.
   A) true                      B) false

49) You can draw graphics on any GUI components.
   A) true                      B) false

50) To check if a string s contains the prefix "Java", you may write (choose all that apply)
    A) if (s.substring(0, 4).equals("Java")) ...
    B) if (s.startsWith("Java")) ...
    C) if (s.indexOf("Java") == 0) ...
    D) if (s.charAt(0) == 'J' && s.charAt(1) == 'a' && s.charAt(2) == 'v' && s.charAt(3) == 'a') ...
1) A
2) A, B, C, D, E
3) D
4) C
5) B
6) A, B, C, D
7) C
8) A
9) C
10) A
11) C, D
12) D
13) A, C
14) A
15) B
16) A
17) A
18) A
19) A, B, C, D, E
20) A, C, D, E
21) B
22) E
23) C
24) A, B, C, D
25) A
26) B
27) A
28) C
29) D
30) A
31) D
32) A
33) D
34) C
35) A
36) C
37) C
38) B
39) A
40) A
41) A
42) A, B, C, D
43) C, D
44) B, D
45) B
46) A, D
47) D
48) A
49) A
50) A, B, C, D
49) 

50) 
