

1) What is the output of the following program (if any)?

```
public class Operators {  
    public static void main(String args[]) {  
        int i = 3, j = 5;  
        int k = i++ + j;  
        System.out.println(i + " " + j + " " + k);  
    }  
}
```

- a) 3 5 8
- b) 4 5 8
- c) 4 5 9
- d) Compilation Error

2) Which of the following expressions is equivalent to the Boolean expression

**!(varA < 5 && varB != varC)**

assume any value for varA, varB and varC

- a) varA > 5 || varB != varC
- b) varA >= 5 || varB == varC
- c) !(varA < 5) || (varB != varC)
- d) None of the above

3) What is the output of the following program (if any)?

```
public class Operators {  
    public static void main(String args[]) {  
        System.out.println(5 + 15 / 3 * 2 - 8 % 3);  
    }  
}
```

- a) 13
- b) 5
- c) 1
- d) Compilation Error

4) What is the output of the following program (if any)?

```
public class CompareToClass {  
    public static void main(String args[]) {  
        String str1 = "Hello";  
        String str2 = "Java";  
        String str3 = "111CS";  
        System.out.println(str1.equals("hello") + " " +  
        (str2.compareTo("java")<0) + " " + (str3.compareTo("CS111")>0));  
    }  
}
```

- a) false false false
- b) false true false
- c) true false true
- d) Compilation Error

5) Which of the following statements are equivalent?

<p>(I)</p> <pre> if (i &gt; 0)     if(j &gt; 0)         x = 0;     else         if (k &gt; 0)             y = 0;         else             z = 0; </pre>	<p>(II)</p> <pre> if (i &gt; 0) {     if (j &gt; 0)         x = 0;     else if (k &gt; 0)         y = 0; } else     z = 0; </pre>
<p>(III)</p> <pre> if (i &gt; 0)     if (j &gt; 0)         x = 0;     else if (k &gt; 0)         y = 0;     else         z = 0; </pre>	<p>(IV)</p> <pre> if (i &gt; 0)     if ((j &gt; 0) &amp;&amp; (i &gt; 0))         x = 0;     else if (k &gt; 0)         y = 0;     else         z = 0; </pre>

- a) (I), (II), and (IV) are equivalent.
- b) (I), (III), and (IV) are equivalent.
- c) (I), (II), and (III) are equivalent.
- d) They are no equivalent statements.

6) Are the following two statements equivalent?

<p>(I)</p> <pre> if (income &lt;= 10000)     tax = income * 0.1; else if (income &lt;= 20000)     tax = 1000 +         (income - 10000) * 0.15; </pre>	<p>(II)</p> <pre> if (income &lt;= 10000)     tax = income * 0.1; else if (income &gt; 10000 &amp;&amp;         income &lt;= 20000)     tax = 1000 +         (income - 10000) * 0.15; </pre>
--	--

- a) Yes.
- b) No.
- c) (I) has a compilation error.
- d) (II) has a compilation error.

7) Consider the following statement

```

if (score > 90)
    pay *= 1.03;
else
    pay = pay * 1.01;

```

- a) It increases **pay** by 1% if **score** is greater than 90, otherwise increases **pay** by 3%.
- b) It increases **pay** by 3% if **score** is less or equal than 90, otherwise increases **pay** by 1%.
- c) It increases **pay** by 3% if **score** is greater than 90, otherwise increases **pay** by 1%.
- d) It has a compilation error.

8) What is the output of the following segment (if any)?

```
int odd = 1;
if(odd) {
    System.out.println("odd");
}
else{
    System.out.println("even");
}
```

- a) odd
- b) even
- c) It runs, but no output
- d) Compilation error

9) What is the output of the following program (if any)?

```
public class Equals{
    public static void main(String [] args){
        int x = 100;
        double y = 100.1;
        boolean b = (x = y);
        System.out.println(b);
    }
}
```

- a) true
- b) false
- c) Compilation fails
- d) It runs, but no output

10) What is the output of the following segment (if any)?

```
int var1=1, var2=2, var3=3;
if(++var1 > var2++ || var1-- > 0)
    var3++;
else
    var3--;
System.out.println(var1+" "+var2+" "+var3);
```

- a) 2 3 2
- b) 1 3 4
- c) 2 2 4
- d) Compilation fails

11) What is the output of the following segment (if any)?

```
double d = 10.5;  
int i = (int)d;  
System.out.println(i+ " " + d);
```

- a) 10 10.5
- b) 10.5 10.5
- c) 10 10.0
- d) Compilation fails

12) After execution of the following code, what will be the value of `cnt`?

```
int cnt = 20;  
if (cnt > 6)  
    cnt = cnt + 5;  
else if (cnt > 10)  
    cnt = cnt + 15;  
else cnt = 9;  
System.out.println(cnt);
```

- a) 20
- b) 25
- c) 18
- d) 17

**Question 2. (2 Marks)**

Given two `int` variables, `x` and `y`, write the following Boolean expressions in Java:

- a) an expression that returns `true` if `x` is divisible by 3.
  
- b) an expression that returns `true` if  $|x - 5| < 4$ .
  
- c) an expression that returns `true` if either `x` is greater than 50 or `y` is greater than 60, but not both.
  
- d) an expression that returns `true` if `x` is even and `y` is odd

**Question 3. (2 Marks)**

Consider the following program:

```
import java.util.Scanner;
public class MyClass {
    public static void main(String [] args) {
        Scanner read = new Scanner (System.in);
        boolean a = read.nextBoolean();
        boolean b = read.nextBoolean();
        if( a ){
            if ( b )
                System.out.println("Output 1");
            }
        else if(a && b){
            System.out.println( "Output 2");
        }
        else{
            if ( !b ){
                System.out.println( "Output 3" ) ;
            }
            else{
                System.out.println( "Output 4" ) ;
            }
            System.out.println( "Output 5" ) ;
        }
        System.out.println( "END" ) ;
    }
}
```

Complete the following table:

value of variable a	value of variable b	output (if any)
true	true	
true	false	
false	true	
false	false	