Institute of Software Engineering

Graduate Diploma in Software Engineering

ITS1010 - Programming Fundamentals – Assignment 04

Answer all the questions and submit your attempt on or before the given date.

1. Input two numbers and check whether the first number is greater than the second number. If so add the two numbers otherwise display the two numbers.

2. Write a java program to find the absolute number of a given integer number.

3. Enter marks Obtained by a student for Chemistry, Physics and Combined maths. Calculate the total and average. If the average is greater than 75 then display "Pass" otherwise "Fail". Write a java program to perform above task.

4. Enter unit price and amount bought from a product. Calculate the total. If the total is greater than Rs.1500/- display "You are entitled for the super draw. Otherwise display "try again".

5. Enter unit price and amount bought from a product. Calculate the total. If the total is more than Rs.500/- give 5% discount. Calculate the discount and new total and display those. Otherwise display "No discount given".

6. Write a Java program to get a Year from user input and find whether it is a leap year or not.

7. Write a Java program to find & print the area of a circle when user input the radius.

8. Customer can withdraw cash from an ATM. Withdrawal is refused
   if amount entered>current balance
   if amount entered > daily limit
   if current balance < 5000 rupees, then a charge of 2% is made.
   if current balance >= 5000, no charge is made
   Write a java program which input a request for a sum of money decides if a withdrawal can be made or not and calculate any charges. Appropriate output messages should be included.

9. Write a java program to find the maximum number of three integer numbers input by the keyboard and print results as follows; "Maximum number is : 45"

10. Write a Java program to input an integer number from the keyboard and print whether the number is odd or even.

11. Which of the following lines can be legally inserted at the line 10?

```
class Example{
   public static void main(String[] args) {
         int x = 10;
         //Insert code here//Line 10
   }
}
```

A. if(x){}
B. if(x=10){}
C. if(x==10){}
D. if(x=100!=10){}
E. if((x=100)!=10){}
F. if((x=100)>0==true){}

12. Which of the following lines can be legally inserted at the line 10?

```
class Example{
   public static void main(String[] args) {
         int x = 10;
         boolean b=true;
         //Insert code here//Line 10
   }
}
```

A. if(b){}
B. if(b=false){}
C. if(b==false){}
D. if(b=false==false){}
E. if((b=false)==false){}
F. if(b=(false==true)){}

13. Write the outputs for the following code lines.

```
int x = 10;
```

A. System.out.println(x=9);
B. System.out.println(x==9);
C. System.out.println(x=9!=10);
D. System.out.println((x=9)==10);
E. System.out.println((x=9)<=10);

14. Write the outputs for the following code lines.

```
boolean b=true;
```

A. System.out.println(b);
B. System.out.println(b=true);
C. System.out.println(b==true);
D. System.out.println(b!=true);
E. System.out.println(b=true==true);
F. System.out.println((b=true)==false);
G. System.out.println(b=(true!=false));

15. Write the outputs for the following code lines.

```
int x=99;
if(x++==x){
    System.out.println("x++==x : "+x);
}
x=99;
if(++x==x){
    System.out.println("++x==x : "+x);
}
x=99;
if(x==x++){
    System.out.println("x==x++ : "+x);
}
x=99;
if(x==++x){
    System.out.println("x==++x : "+x);
}
x=99;
if(++x==++x){
    System.out.println("++x==++x : "+x);
}
x=99;
if(x++==x++){
    System.out.println("x++==x++ : "+x);
}
x=99;
if(++x==x++){
    System.out.println("++x==x++ : "+x);
}
x=99;
if(x++==++x){
    System.out.println("x++==++x : "+x);
}
```

16. Write the outputs for the following code lines.

```
int x=99;
if(x++==x){
    System.out.println("x++==x : "+x);
}
if(++x==x ){
    System.out.println("++x==x : "+x);
}
if(x==x++){
    System.out.println("x==x++ : "+x);
}
if(x==++x){
    System.out.println("x==++x : "+x);
}
if(++x==++x){
    System.out.println("++x==++x : "+x);
}
if(x++==x++){
    System.out.println("x++==x++ : "+x);
}
if(++x==x++){
    System.out.println("++x==x++ : "+x);
}
```

17. Write the outputs for the following code lines.

```
int x=99;
int y=99;
if(x++==y){
    System.out.println("x++==y : "+x+" : "+y);
}
if(++x==y){
    System.out.println("++x==y : "+x+" : "+y);
}
if(x==y++){
    System.out.println("x==y++ : "+x+" : "+y);
}
if(x==++y){
    System.out.println("x==++y : "+x+" : "+y);
}
if(++x==++y){
    System.out.println("++x==++y : "+x+" : "+y);
}
if(x++==y++){
    System.out.println("x++==y++ : "+x+" : "+y);
}
if(++x==y++){
    System.out.println("++x==y++ : "+x+" : "+y);
}
if(x++==++y){
    System.out.println("x++==++y : "+x+" : "+y);
}
```

18. Given code fragment:

```
int x=9;
/*Insert code here */ {  //12
    System.out.println("Success");
}
```

Which of the followings can be inserted at the line 12 to get the output “Success”

A. if(x>=10) B. if(x++>=10) C. if(++x>=10)
D. if(++x>=x++) E. if(++x>x++) F. if(x++>=x++)
G. if(++x<=x++) H. if(x<=x++)

19. Given code fragment:

```
int x=100,y=99;
    /* Insert Code here*/ {  //Line 12
    System.out.println("Success");
}else{
    System.out.println("Failed");
}
```

Which of the following lines can be inserted at the line 12 to get the output as “Success”

A. if(x==y) B. if(x++==++y)
C. if(x++==y++) D. if(++x==y++)

20. What are the outputs of following commands?

```
byte b = 10;
short s = 100;
int x = 125;
long l = 15000;
float f = 1.5f;
double d = 21.231;
char c = 'c';
boolean bool = 10>9;
System.out.println(b+s+x+""+f+d+c+bool);  //Line 1
System.out.println(""+b+s+x+f+d+c+bool);  //Line 2
System.out.println(b+s+x+f+d+c+""+bool);  //Line 3
System.out.println(b+s+x+f+d+c+bool+"");  //Line 4
System.out.println(bool+b+f+d+c+""+x+l);  //Line 5
```

21. Assume that i = 1, j = 2, k = 3 and m = 2. What does each of the following statements print?

```
System.out.println( i ==1);                  //Line 1
System.out.println( j ==3);                  //Line 2
System.out.println( ( i >=1) && ( j <4) );   //Line 3
System.out.println( ( m <=99) & ( k < m ) ); //Line 4
System.out.println( ( j >= i ) || ( k == m ) ); //Line 5
System.out.println( ( k + m < j )|(3- j>= k)); //Line 6
System.out.println( !( k > m ) );            //Line 7
```

22. What are the outputs of following commands?

```
int x=20,y=60;
boolean bool;
System.out.println(x=10);                 //Line 1
System.out.println(bool=true);            //Line 2
System.out.println(x=10>0);               //Line 3
System.out.println((x=10)>0);             //Line 4
System.out.println(bool=(x=10)>0);        //Line 5
System.out.println(bool=x+y>100);         //Line 6
```

23. Given:

```
class Example{
  public static void main(String args[]){
    //line 5
    switch(x){
      default   : System.out.print("4 ");
      case 1    : System.out.print("1 ");
      case 2    : System.out.print("2 ");
      case 3    : System.out.print("3 ");
    }
  }
}
```

What will be the outputs when you insert the following codes at the line 5?

A. int x=1; B. int x=2; C. int x=3;
D. int x=4; E. int x=0; F. int x=5;

24. Which of the following lines are legal?

```
import java.util.*;
class Example{
  public static void main(String args[]){
    int x=100;
    System.out.println(x);                //Line 1
    {
      int y=200;
      {
        int z=300;
        System.out.println(x);            //Line 2
        System.out.println(y);            //Line 3
        System.out.println(z);            //Line 4
      }
      System.out.println(x);   //Line 5
      System.out.println(y);   //Line 6
      System.out.println(z);   //Line 7
    }
    System.out.println(x);                //Line 8
    System.out.println(y);                //Line 9

    System.out.println(z);                //Line 10
  }
}
```

A. Line 1 B. Line 2 C. Line 3 D. Line 4
E. Line 5 F. Line 6 G. Line 7 H. Line 8
I. Line 9 K. Line 10

25. Given:

```
class Example{
  public static void main(String args[]){
    //Line 5
    switch(x){
      default   : System.out.print("4 ");break;
      case 2    : System.out.print("2 ");
      case 3    : System.out.print("3 ");
      case 1    : System.out.print("1 ");break;

    }
  }
}
```

What will be the outputs when you insert the following codes at the line 5?

A. int x=1; B. int x=2; C. int x=3;
D. int x=4; E. int x=0; F. int x=5;

26. Which of the following code fragments can be inserted at line 10 to legal line 12

```
final int x=100;
final int y;
y=100;
int z=100;
int a;
//Insert code here          //Line 10
System.out.println(a);     //Line 12
```

A. if(x>0){a=0;} B. a=0; C. if(y>0){a=0;}
D. if(z>0){a=0;} E. if(true){a=0;}
G. if(y>0){a=0;}else {a=-1;}
H. a=z>0?0:-1;

27. Given:

```
class Example {
    public static void main(String[] args) {
        int a = 2;
        char b,c,d;
        b = (a < 2) ? 'f' : 'g';        // 1
        if (a < 2) c = 'h'; else c = 'i';   // 2
        if (a < 2) d = 'j';        // 3
        if (a > 2) d = 'k';        // 4
        if (a == 2) d = 'l';       // 5
        System.out.print(b + "," + c + "," + d);    // 6
    }
}
```

What is the result of attempting to compile and run the program?

A. Prints: g, i, l
B. Compiler Error: variable b might not have been initialized.
C. Compiler Error: variable c might not have been initialized.
D. Compiler Error: variable d might not have been initialized.
E. Runtime Exception
F. None of the above.

28. Given Code:

```
class Example{
    public static void main(String args[]){
        int a=-5;
        int b=-2;
        a%=b;
        a/=b;
        b=a>0?0:a;
        System.out.println(a+" "+b);
    }
}
```

Select one option?

A. Prints 1 0 B. Prints -1 -1
C. Prints -2 -2 D. Prints 0 0

29. Given:

```
class Example{
    public static void main(String args[]){
        int a=1;
        final int b=2;
        final int c;
        c=3;
        final char d='A';
        final char e='B';
        int x=1;
        switch(x){
            case 65: System.out.print("65");
            //Insert code//line 10
        }
    }
}
```

Which of the following codes can be inserted legally at line 10

A. case a:// B. case b: //
C. case c: D. case e:
E. case f: F. case 'A':
G. case 1.0: H. case (char)66:

30. Given:

```
//Insert code here //line 4
switch(x){
    case 'A'  : System.out.println("65 ");break;
    case 'B'  : System.out.println("66 ");break;
    case 'C'  : System.out.println("67 ");break;
    default   : System.out.println("wrong ");
}
```

Which of the following codes can be inserted legally at line 4

A. char x='A'; B. int x=65; C. int x=65536;
D. byte x=65; E. short x=66 ;
F. boolean x =true; G. String x="A";
H. double x=65.0;

31. Given Code fragment:

```
Scanner input=new Scanner(System.in);
System.out.print("Input student average : ");
double avg=input.nextDouble();
if(avg>=50){
    System.out.println("Pass");
}else{
    System.out.println("Fail");
}
System.out.println("Thanking you..");
```

What are outputs for the following inputs?

A. 99 B. 75 C. 49.99 D. 50.01
E. 50.0 F. 49.0 G. 25

32. What are the outputs of following commands?

```
System.out.println(12+8/5%4*(5-4/5)+4*5);                 //Line 1
System.out.println(4%5*3-4/7+4%2-5/(5*4%5));              //Line 2
System.out.println(5-8%4*5(5/8*(3%4)*4)+8/4+1);           //Line 3
System.out.println(1.5%2.1-5.4*1.1/(5.4%5));              //Line 4
System.out.println((5+4)%4+(5/8.0)+4);                    //Line 5
System.out.println(5-4*6(5%4-3)*5+6/(1.0/2.0)-5*4);       //Line 6
System.out.println(7+3-4*4%6+4*2.5-3%2);                  //Line 7
System.out.println(5-7*(9%4)+5+8/7+2);                    //Line 8
System.out.println((2-5%5)-10.8%5.1*5*4);                 //Line 9
System.out.println(5+5-4/(3%1+5+(7-8)*4+5));              //Line 10
System.out.println(9%4*5+6%10-5*4);                       //Line 12
System.out.println(9%1+5-(5+5%2)-5/8+5);                  //Line 13
System.out.print(((7 * 2) % 5)+" ");                      //Line 14
System.out.print(" " + (7 % 5));                          //Line 15
```

33. What are the outputs of following commands?

```
int a=1,b=2,c=3,d=4;
int x;
x=a++ + b++ + c++ + d++;
System.out.println(a+" "+b+" "+c+" "+d+" "+x);    //Line 1
x+=a+=b+=c+=d;                                    //Line 2
System.out.println(a+" "+b+" "+c+" "+d+" "+x);    //Line 3
x=a=b=c=d;                                        //Line 4
System.out.println(a+" "+b+" "+c+" "+d+" "+x);    //Line 5
```

34. What are the outputs of following commands?

```
boolean b = false;
System.out.println(10>4 && true !=b==(10+3/2==8)==true);   //Line 1
System.out.println(b=false==true||true!=(b=false));        //Line 2
System.out.println((b=false)=true?4:5==5&true==3*2<=29);   //Line 3
System.out.print (('a' == 'a')+" ");                       //Line 4
System.out.print(('a' == 'b')+" ");                        //Line 5
System.out.print((5 != 6)+" ");                            //Line 6
System.out.print((5.0 == 5L)+" ");                         //Line 7
System.out.println((true == false));                       //Line 8
```

35. What are the outputs of following commands?

```
boolean b1, b2, b3;
b1 = true != false;                                  //Line 1
b2 = 5%3 == 2 ^ true == !false ;                     //Line 2
System.out.println((b3 =true) & b2 || b1 == false);  //Line 3
System.out.println(b3 = b2 == b1);                   //Line 4
b3= true;                                            //Line 5
System.out.println(b3^b2&b1|false != (b3 = false));  //Line 6
System.out.println(!b3==b2 && b2 != b1 ||!b1 != b2);  //Line 7
```

References:
http://zetcode.com/lang/java/expressions/
http://www.cs.bilkent.edu.tr/~guvenir/courses/CS101/op_precedence.html
https://www.programiz.com/java-programming/operator-precedence
https://introcs.cs.princeton.edu/java/11precedence/

Java operator precedence

The *operator precedence* tells us which operators are evaluated first. The precedence level is necessary to avoid ambiguity in expressions.

What is the outcome of the following expression, 28 or 40?

```
3 + 5 * 5
```

Like in mathematics, the multiplication operator has higher precedence than the addition operator. So the outcome is 28.

```
(3 + 5) * 5
```

Java associativity rule

Sometimes the precedence is not satisfactory to determine the outcome of an expression. There is another rule called associativity. The associativity of operators determines the order of evaluation of operators with the same precedence level.

Operator	Description	Associativity
++	unary postfix increment	right to left
--	unary postfix decrement	
++	unary prefix increment	right to left
--	unary prefix decrement	
+	unary plus	
-	unary minus	
!	unary logical negation	
~	unary bitwise complement	
(*type*)	unary cast	
*	multiplication	left to right
/	division	
%	remainder	
+	addition or string concatenation	left to right
-	subtraction	
<<	left shift	left to right
>>	signed right shift	
>>>	unsigned right shift	
<	less than	left to right
<=	less than or equal to	
>	greater than	
>=	greater than or equal to	
instanceof	type comparison	
==	is equal to	left to right
!=	is not equal to	