

Part A (40 Marks)

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

- 1) What is the result of applying the command: **javac ClassExam.java**. The text of the **ClassExam.Java** file is : 1) _____

```
public class ClassExam {  
  
    public static void main(String[] args) {  
        int i=0;  
        myMain(i);  
    }  
    private static void myMain(int i){  
        i ++;  
    }  
}
```

- A) The generation of compile-time errors
B) The creation of the file ClassExam.class
C) The output of the value of the variable i
D) The generation of run-time errors
E) None of the above
- 2) What is the result of applying the command: **java HelloExam.class**. The text of the **HelloExam.java** file is : 2) _____

```
import javax.swing.JOptionPane;  
public class HelloExam {  
  
    public static void main(String[] args) {  
        display();  
        String s = "Hello Exam!";  
    }  
  
    public static void display(){  
        JOptionPane.showMessageDialog(null, "Input?");  
    }  
}
```

- A) No output
B) The display of the message : **Hello Exam!**
C) The generation of an error free file with the name : **HelloExam.java**
D) The display of the message : Input?
E) None of the above
- 3) The file name **Exam.Java** suggests that it refers to _____ 3) _____
- A) an executable Java program file
B) a binary Java program file
C) a Java source code file
D) a Java requirement specification file
E) none of the above

- 4) Compiling a source code file results in the generation of ____ 4) _____
- A) a binary executable program file
 - B) an error free source code file
 - C) an executable program file when there are no compilation errors
 - D) compilation errors
 - E) none of the above

- 5) What will happen as a result of compiling the file **ExamError.java** given below : 5) _____

```
public class ExamErrors {
    public static void main(String[] args) {
        int i=0;
        i++;
    }
    public static void echo(){
        javax.swing.JOptionPane.showMessageDialog(null, "Hello!");
    }
}
```

- A) The generation of compile-time errors
- B) The display of the message : **Hello!**
- C) The generation of a file with the name : **ExamError.class**
- D) The generation of run-time errors
- E) None of the above

- 6) What will happen as a result of running the program **ExamRun.class** whose source code is given below : 6) _____

```
public class ExamRun {

    public static void main(String[] args) {
        display("0");
        int echo=10;
    }

    public static void display(String i){
        int echo=0;
    }

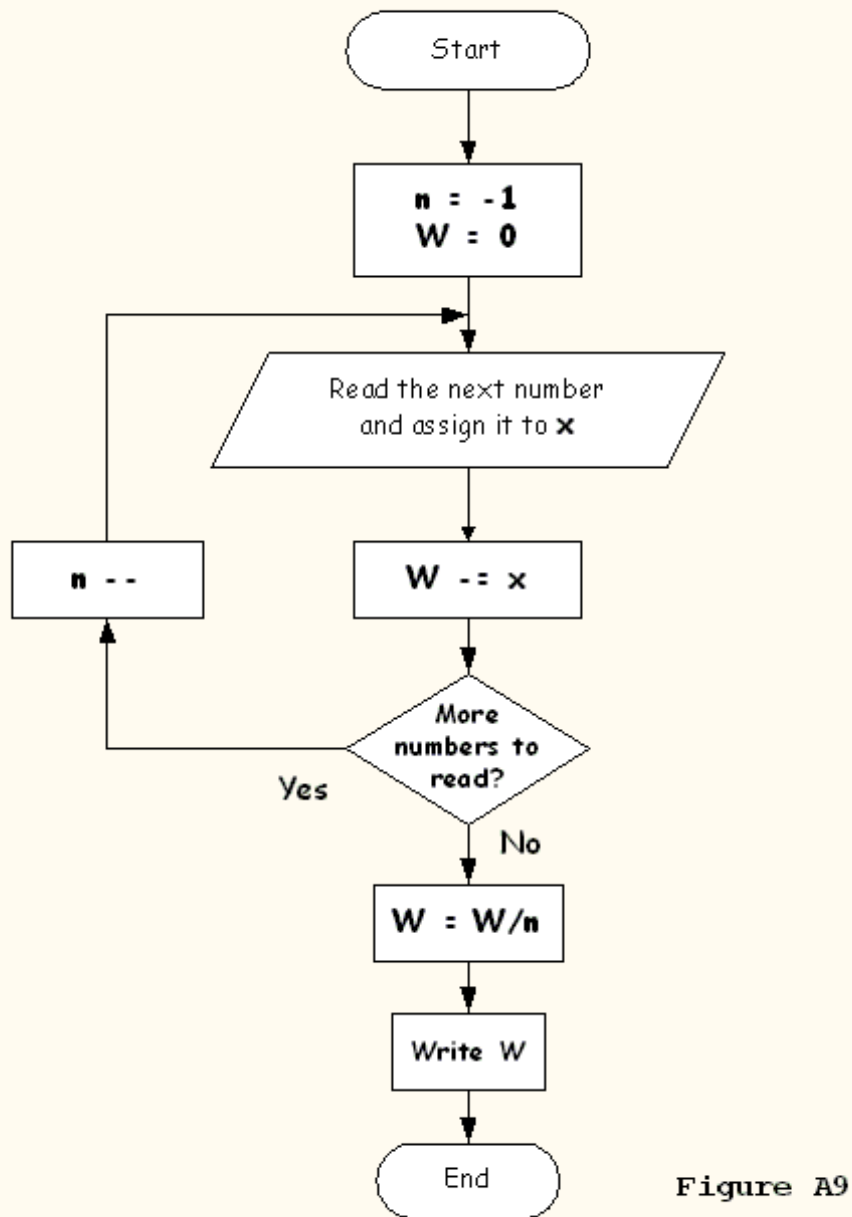
    public void echo(int i){
        javax.swing.JOptionPane.showMessageDialog(null,i);
    }

}
```

- A) The generation of compile-time errors
- B) The generation of run-time errors
- C) The display of the message : 10
- D) The display of the message : 0
- E) None of the above

7) What will be the value of **W** when the algorithm of figure A9 executes to completion assuming that the input sequence of numbers is: **-1, 2, -2, 1, -1, 2, 1, -2** ?

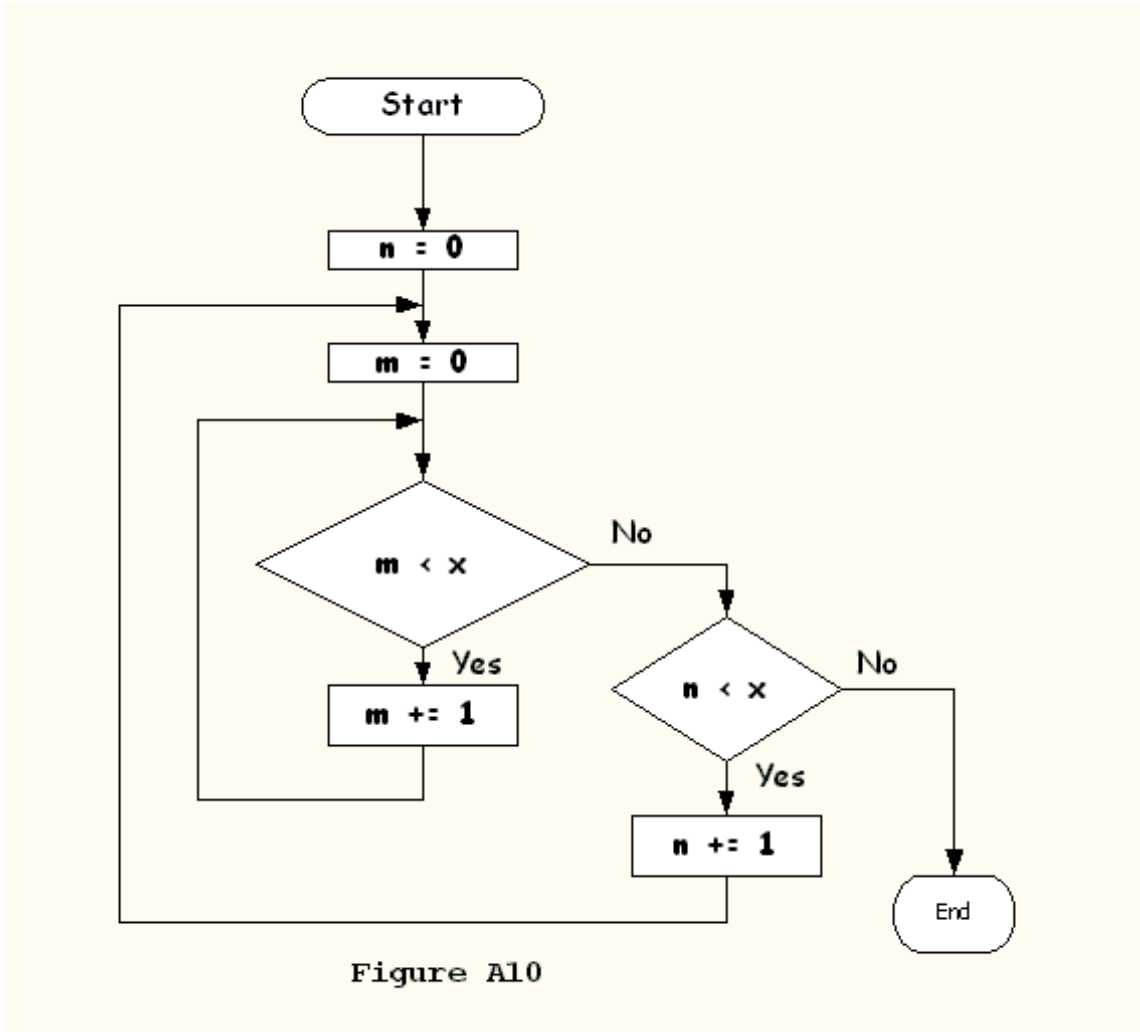
7) _____



- A) 1.5
- B) -1
- C) -2
- D) 0
- E) None of the bove

8) For what value of the parameter x the Algorithm of Figure A10 will have one or more infinit loops?

8) _____



- A) -1
- B) 0
- C) 1
- D) 2
- E) None of the bove

9) What will be the output of the following program when it is run?

9) _____

```
public class TQ328 {
    public static void main(String[] args) {
        int x =10,y=3;
        double z=0.5;
        z = z*y+x;
        System.out.println(z);
    }
}
```

- A) 11
- B) 10
- C) 11.5
- D) The program does not compile correctly
- E) None of the above

10) What will be the output of the following program when it is run?

10) _____

```
public class TQ329 {
    public static void main(String[] args) {
        int w=7,y=3;
        double x=0.5;
        x = w/y+x;
        System.out.println(x);
    }
}
```

- A) 2
- B) 2.5
- C) 3
- D) The program does not compile correctly
- E) None of the above

11) What will be the output of the following program when it is run?

11) _____

```
public class TQ330 {
    public static void main(String[] args) {
        double a=2,b=3;
        int x=3;
        b = x/a+x;
        System.out.println(b);
    }
}
```

- A) 4
- B) 0.6
- C) 4.5
- D) The program does not compile correctly
- E) None of the above

12) What will be the output of the following program when it is run?

12) _____

```
public class TQ331 {
    public static void main(String[] args) {
        final String a ="1";
        final String b ="1.0";
        String c = a+b;
        double x = Double.parseDouble(c);
        System.out.println(x);
    }
}
```

- A) 2
- B) 2.0
- C) 11.0
- D) The program does not compile correctly
- E) None of the above

13) What will be the output of the following program when it is run?

13) _____

```
public class TQ332 {
    public static void main(String[] args) {
        double x = 2.5;
        double a = 4;
        int y = 0;

        int z = y*x + Math.sqrt(a);

        System.out.println(z);
    }
}
```

- A) 2.0
- B) 2
- C) The program will have a run-time error
- D) The program does not compile correctly
- E) None of the above

14) What will be the output of the following program when it is executed?
The ASCII codes for 'a' and 'A' are 97 and 65 respectively.

14) _____

```
public class TQ333 {
    public static void main(String[] args) {

        char a = 'A';
        char A = 'a';

        int b = a+A;
        String s = "["+b;

        System.out.println(s);
    }
}
```

- A) [aA
- B) [a+A
- C) [6597
- D) [162
- E) None of the above

15) What will be the output of the following program when it is executed?

15) _____

```
public class TQ334 {
    public static void main(String[] args) {
        boolean i=false;
        String sa = "GTCAGTCCCACGTGACAAAA";

        int flag = sa.indexOf("GTC");
        String sb = sa.substring(flag);

        flag = flag + sb.indexOf(sa);
        System.out.println(flag);
    }
}
```

- A) 20
- B) 3
- C) 4
- D) 1
- E) None of the above

16) What will be the output of the following program when it is executed?

16) _____

```
public class TQ335 {
    public static void main(String[] args) {

        String s ="GUCACGUGAC";
        int i = s.length()/2;
        int j = s.indexOf("GA",i-1);
        String y = s.substring(i,j);
        System.out.println(y);

    }
}
```

- A) ACGUGA
- B) GA
- C) GAC
- D) GU
- E) None of the above

17) What will be the output of the following program when it is executed?

17) _____

```
public class TQ414 {
    public static void main(String[] args) {

        int x = 1, y=2;
        double z = 0.99;

        boolean f = z < x && z < y || !( x == 1);

        System.out.println(f) ;

    }
}
```

- A) true
- B) false
- C) The program will not compile
- D) The program will have a run-time error
- E) None of the above

18) What will be the output of the following program when it is executed?

18) _____

```
public class TQ415 {
    public static void main(String[] args) {
        int x=2, y=2;

        if( x <= y ){
            x -= x - y;
        }

        if( x > y) {
            x ++;
        }
        System.out.println(x);
    }
}
```

- A) 0
- B) 6
- C) 4
- D) 2
- E) None of the above

19) What will be the output of the following program when it is executed?

19) _____

```
public class TQ416 {
    public static void main(String[] args) {
        int w,z;
        String[] v ={"A", "U", "G"};
        int out=0;

        String s="U";
        w = v.length;
        z = s.length();

        if( s.equals(v[out])){
            out = out + 1;
        }else if (w <= z){
            out = z;
        }else{
            out = w;
        }
        System.out.println(out);
    }
}
```

- A) 1
- B) 2
- C) 3
- D) The program does not compile
- E) None of the above

20) What will be the output of the following program when it is executed?

20) _____

```
public class TQ417 {
    public static void main(String[] args) {

        double x = 0.2, y = 0.5;
        int a=0;

        if( x >= 0.2 && y <= 0.5){
            a = 1;
        } else if (x ==0.2 && y == 0.5){
            a = 2;
        } else{
            a = 3;
        }
        System.out.println(a);
    }
}
```

- A) 1
- B) 2
- C) 3
- D) The program does not compile
- E) None of the above

21) What will be the output of the following program when it is executed?

21) _____

```
public class TQ418 {
    public static void main(String[] args) {
        int i,j=0;
        String s = "AGATAAATGA";
        String p = s.substring(s.length()/2 );
        String q = s.substring(0,s.length()/2);
        String w = p+q;

        i = w.length();

        switch (i){
            case 0:
                j=10;
                break;

            case 4:
                j=6;
                break;

            case 5:
                j=4;
                break;

            case 10:
                j = 5;
                break;
        }
        System.out.println(j);
    }
}
```

- A) 10
- B) 6
- C) 4
- D) 5
- E) None of the above

22) What will be the output of the following program when it is executed?

22) _____

```
public class TQ419 {
    public static void main(String[] args) {
        int x = 4;
        int m = 0;

        if( x == 2){
            m = 1;
        }else if( x > 3){
            m = 2 ;
        }else if ( x == 4){
            m = 3;
        }
        System.out.println(m);
    }
}
```

- A) 0
- B) 1
- C) 2
- D) 3
- E) None of the above

23) What will be the output of the following program when it is executed?

23) _____

```
public class TQ420 {
    public static void main(String[] args) {
        int n=1, m= 1, p;
        if( n > m ){
            p = n - m;
        } else {
            p = m - n;
        }
        System.out.println(p);
    }
}
```

- A) 0
- B) 1
- C) 2
- D) No output
- E) None of the above

24) What will be the output of the following program when it is executed?

24) _____

```
public class TQ57 {
    public static void main(String[] args) {
        String s="0";
        String[] x ={"0","1","2"};
        for(int k=0;k<3;k++){
            s += x[k];
        }
        System.out.println(s);
    }
}
```

- A) 3
- B) 4
- C) 0012
- D) The program does not compile
- E) None of the above

25) What will be the output of the following program when it is executed?

25) _____

```
public class TQ58 {
    public static void main(String[] args) {

        int x = 7;
        while ( x > 0){
            x -= 2;
        }
        System.out.println(x);
    }
}
```

- A) 0
- B) 1
- C) -1
- D) -2
- E) None of the above

26) What will be the output of the following program when it is executed?

26) _____

```
public class TQ59 {
    public static void main(String[] args) {
        int m=0;
        int y = 21;
        do{
            y = y/2;
            m++;
        } while( y != 0 );

        System.out.println(m);
    }
}
```

- A) 4
- B) 5
- C) The program has an infinite loop
- D) The program does not compile
- E) None of the above

27) What will be the output of the following program when it is executed?

27) _____

```
public class TQ510 {
    public static void main(String[] args) {
        int aij=0;
        int n = 3;
        int m = 3;
        for(int i=0;i<n;i++){
            for(int j=0;j<m;j++){
                if( i != j){
                    aij = aij;
                } else{
                    aij++;
                }
            }
        }

        System.out.println(aij);
    }
}
```

- A) 3
- B) 4
- C) 9
- D) 12
- E) None of the above

28) What will be the output of the following program when it is executed?

28) _____

```
public class TQ511 {
    public static void main(String[] args) {

        int x=10,m=0;
        while( x > 0){

            for(int i=0;i<1;i++){
                x +=1;
            }

            x -=2;
            m++;
        }
        System.out.println(m);
    }
}
```

- A) 20
- B) 10
- C) 5
- D) The program has an infinite loop
- E) None of the above

29) What will be the output of the following program when it is executed?

29) _____

```
public class TQ512 {
    public static void main(String[] args) {
        int y = 7;
        do{
            y -= 3;
        } while(y > 0);
        System.out.println(y);
    }
}
```

- A) 0
- B) 1
- C) -2
- D) No output
- E) None of the above

30) What will be the output of the following program when it is executed?

30) _____

```
public class TQ78 {
    public static void main(String[] args) {
        double[] z = { 1,2,3,4,5,6,7};
        System.out.println(doWork(z,true));
    }

    private static double doWork(double[] x, boolean y){
        double z =0;
        for(int i=0;i<x.length;i++) {

            if(y){
                if( x[i] % 2 == 0)
                    z += x[i];

            } else{
                if( x[i] % 2 != 0)
                    z += x[i];

            }
        }
        return z;
    }
}
```

- A) 7.0
- B) 12.0
- C) 18.0
- D) The program does not compile
- E) None of the above

31) What will be the output of the following program when it is executed?

31) _____

```
public class TQ79 {
    public static void main(String[] args) {
        int n =5;
        n = dec(n,n);

        System.out.println(n);
    }

    public static int dec(int x, int n){
        x = 1;
        n = 2;
        return n+x;
    }
}
```

- A) 5
- B) 2
- C) 1
- D) The program does not compile
- E) None of the above

32) What will be the output of the following program when it is executed?

32) _____

```
public class TQ710 {
    public static void main(String[] args) {
        String y = "ABCXBCA";
        String[] x = new String[y.length()];
        doWork(x,y);
        String s=x[0];
        for(int j=1;j<x.length;j++){
            s += x[j];
        }
        System.out.println(s);
    }
    public static void doWork(String[] x, String y){
        int n= x.length;
        for(int i=0;i<x.length;i++){
            x[i] = y.substring(n-i-1,n-i);
        }
    }
}
```

- A) ABCXBCA
- B) CBXCBA
- C) The program has run-time errors
- D) The program does not compile
- E) None of the above

33) What is the output of the following program? The seven lines of the file **in87.txt** contain 33) _____

the data : 4 , 0 , 2 , 7 , 8 , 5 , 5

```
import java.io.BufferedReader;
import java.io.FileReader;
import java.io.IOException;
public class TQ87 {

    public static void main(String[] args) throws IOException{

        BufferedReader in =
            new BufferedReader(new FileReader("in87.txt"));
        int x =7;
        double[] n = new double[x];

        for(int i=0;i<x;i++){
            n[i] = Double.parseDouble((in.readLine()).trim());
        }
        in.close();

        double y=0;
        for(int j=0;j<x;j++){
            for(int k=j;k<x;k++){
                if( n[j]<n[k]){
                    y = n[j];
                    n[j]=n[k];
                    n[k]=y;
                }
            }
        }

        System.out.println(n[0]);
    }
}
```

- A) 0.0
- B) 7.0
- C) 8.0
- D) 31.0
- E) None of the above

34) What is the output of the following program?

34) _____

```
import java.io.BufferedReader;
import java.io.FileReader;
import java.io.IOException;
public class TQ89 {

    public static void main(String[] args) throws IOException{

        int[]a = { 4,2,3,'A',4,'B'};
        int diff = 0;
        for(int i=0;i<a.length;i++){
            if( i <=2){
                diff += a[i];
            }
        }

        System.out.println(diff);
    }
}
```

- A) 2
- B) 6
- C) 9
- D) The program will not compile
- E) None of the above

35) What is the output of the following program? The single line of the file **in810.txt** contain the data : 56789:1:2:3:4

35) _____

```
public class TQ810 {
    public static void main(String[] args) throws IOException {
        BufferedReader in =
            new BufferedReader(new FileReader("in810.txt"));

        String line = in.readLine();
        in.close();

        String a[] = line.split(":");

        String s = a[0];
        int n=0;
        for(int i=0;i<a.length-1;i++){
            n += Integer.parseInt(a[i+1].trim());
        }

        System.out.println(n);
    }
}
```

- A) 7
- B) 8
- C) 9
- D) 10
- E) None of the above

36) What is the output of the following program when it is executed?

36) _____

```
public class TQ911 {
    private double x;
    private double y;
    private static double val=0;
    public static void main(String[] args) {
        int n=3;
        TQ911[] a = new TQ911[n*n];
        for(int i=0;i<n;i++){
            for(int j=0;j<n;j++){
                String s = i + ":" + j;
                a[i+j*(n-1)] = new TQ911(s);

                if( val < a[i+j*(n-1)].getValue()){
                    val = a[i+j*(n-1)].getValue();
                }
            }
        }
        System.out.println(val);
    }

    TQ911(String w){
        String[] a = w.split(":");
        x = Double.parseDouble(a[0]);
        y = Double.parseDouble(a[1]);
    }

    private double getValue(){
        return x*y;
    }
}
```

- A) 0.0
- B) 2.0
- C) 3.0
- D) 4.0
- E) None of the above

37) What is the output of the following program when it is executed?

37) _____

```
public class TQ912 {
    private int n=1;
    public static void main(String[] args) {
        TQ912 x = new TQ912();
        System.out.println(x.doFun());
    }

    private void doN(){
        n = n*(n+1);
    }
    private int doFun(){
        while( n*n < 9){
            doN();
        }
        return n;
    }
}
```

- A) 1
- B) 4
- C) 6
- D) 9
- E) None of the above

38) What is the output of the following program when it is executed?

38) _____

```
public class TQ913 {
    private static int x=0;
    public static void main(String[] args) {

        TQ913 y = new TQ913();
        TQ913 z = new TQ913();

        y.inc();
        z.inc();
        inc();

        System.out.println(y.getX());
    }

    TQ913(){
    }

    private static int getX(){
        return x;
    }
    private static void inc(){
        x ++;
    }
}
```

- A) 0
- B) 1
- C) 2
- D) 3
- E) None of the above

39) What is the output of the following program when it is executed? The program is composed of four classes which are listed below.

39) _____

```
public class TQ101 {
    public static void main(String[] args) {
        int n=5;
        Shape[] s = new Shape[n];

        for(int i=0;i<n;i++){
            s[i] = getShape(i);
        }
        System.out.println(compute(s));
    }
    public static Shape getShape(int i){
        if( i % 2 ==0){
            return new Circle(i);
        }else{
            return new Polygon(i,i);
        }
    }
}
```

```

    }
}
public static double compute(Shape[] a){
    double nc =0;
    for(int i=0;i<a.length;i++){
        if( a[i].check(nc)){
            nc = a[i].getMeasure();
        }
    }
    return nc;
}
}

abstract class Shape {
    protected abstract double getMeasure();
    protected abstract boolean check(double x);
}

public class Polygon extends Shape{
    private double x;
    private double y;
    Polygon(double x_,double y_){
        x = x_;
        y = y_;
    }
    public double getMeasure(){
        return 2*(x+y);
    }
    public boolean check(double z){
        if( getMeasure() > z)
            return true;
        return false;
    }
}

public class Circle extends Shape{
    private double r;
    Circle(double r_){
        r = r_;
    }
    public double getMeasure(){
        return 2*r;
    }
    public boolean check(double z){
        if( getMeasure() > z)
            return true;
        return false;
    }
}
}

```

- A) 2.0
- B) 5.0
- C) 10.0
- D) 12.0
- E) None of the above

40) Which of the following is a valid Java conditional statement?

40) _____

- A) $7 < n < 17$
- B) $7 < n \ || \ < 17$
- C) $7 < n \ || \ 17$
- D) $(7 < n) \ || \ (n < 17)$
- E) None of the above