Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. What is wrong with the following “skeleton” of a Java program?

   ```java
   public class MyClass
   {
   public static void main(String args[])
   {
   }
   }
   ```

   A. `public` and `class` on the first line should be interchanged
   B. `MyClass` name is wrong
   C. There should not be a `[]` after `args`
   D. Nothing is wrong
   E. None of these

2. Which line of code will cause Hello to be printed?

   A. `System.out.println("Hello");`
   B. `System.out.println(Hello);`
   C. `System.out.println("Hello")`
   D. All of these
   E. None of these

3. What is actually printed with the following code?

   ```java
   System.out.print("Fire");
   System.out.println(" Ants");
   ```

   A. FireAnts
   B. Fire Ants
   C. Fire
   D. Pants on fire
   E. None of these

4. What is the syntax for indicating that a line of text is not Java code; rather, it is a remark?

   A. `rem`
   B. `\`
   C. `//`
   D. `comment`
   E. None of these
Lesson 1 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: D    PTS: 1
2. ANS: A    PTS: 1
3. ANS: B    PTS: 1
4. ANS: C    PTS: 1
Lesson 2 ...Quiz

Multiple Choice
*Identify the choice that best completes the statement or answers the question.*

___ 1. What are the three variable types we have studied up to this point?

A. String, float, spinner
B. integer, dblPrec, ace
C. int, double, word

___ 2. Suppose you have the number 189.24. Which variable type would you use to store this number?

A. String
B. int
C. double

___ 3. Which line of code declares \( k \) to be an integer?

A. \( k \) int;
B. \( int \) \( k \);
C. integer \( k \);

___ 4. Which of the following is an illegal name for a variable?

A. Num
B. flag-stuff
C. 12flag

___ 5. Which of the following is the least desirable way to name a variable?

A. redcolor
B. red_color
C. redColor
D. String, int, double
E. None of these
F. Both A and D
Lesson 2 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: D  PTS:  1
2. ANS: C  PTS:  1
3. ANS: B  PTS:  1
4. ANS: E
   ...both B and C are illegal
   PTS:  1
5. ANS: F  PTS:  1
Lesson 3 Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What is output by the following code?

   ```java
   String s = “Mona Lisa”;
   System.out.println(s.length());
   ```

   A. 7  D. 9
   B. illegal code  E. None of these
   C. 8

2. What is output by the following code?

   ```java
   String girl = “Heather Jones”;
   System.out.println(girl.substring(8));
   ```

   A. Heather (one space after the ‘r’)  D. 8Jones
   B. er Jones  E. None of these
   C. Jones

3. What is output by the following code?

   ```java
   String girl = “Heather Jones”;
   System.out.println(girl.substring(8,11));
   ```

   A. Jon  D. ather Jones
   B. one  E. None of these
   C. ones

4. What is the index of the ‘L’ in the String “Abraham Lincoln”?

   A. 9  D. 0
   B. 8  E. None of these
   C. 7

5. What is output by the following code?

   ```java
   String s = “Beaver Cleaver”;
   System.out.println(s.toUpperCase());
   ```

   A. beaver cleaver  D. eEAVER cLEAVER
   B. BEAVER CLEAVER  E. None of these
   C. b
Lesson 3 Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: D PTS: 1
2. ANS: C PTS: 1
3. ANS: A PTS: 1
4. ANS: B PTS: 1
5. ANS: B PTS: 1
Lesson 4 ...Quiz

Multiple Choice
*Identify the choice that best completes the statement or answers the question.*

1. If `int j = 3`, what will be the value of `j++`?
   - A. 4
   - B. 3
   - C. 2
   - D. 3.1
   - E. None of these

2. What is another way to write `p = p –1;`?
   - A. `p++`
   - B. `++p`
   - C. `1 - p`
   - D. `p + 1`
   - E. None of these

3. Write `x += j;` another way.
   - A. `x = x + j;`
   - B. `x + j = x;`
   - C. `x + x = j;`
   - D. `j = j + x;`
   - E. None of these

4. Write code that is equivalent to saying the new value of `w` is the old value of `w` plus 6?
   - A. `w = w + 6;`
   - B. `w += 6`
   - C. `w++6`
   - D. Both A and B
   - E. Both B and C

5. Which of the following is illegal?
   - A. `x +=9;`
   - B. `x = 9;`
   - C. `9 = x;`
   - D. `x = ++9;`
   - E. More than one of these
MULTIPLE CHOICE

1. ANS: A  PTS:  1
2. ANS: E  PTS:  1
   ... answer is \( p\rightarrow \) or \( \sim p \)

3. ANS: A  PTS:  1
4. ANS: A  PTS:  1
5. ANS: E  PTS:  1
   ... both C and D
Lesson 5 ...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. Which of the following is illegal?

A. int i = 5/2;
B. double d = 27;
C. int i = 203.932;
D. More than one of these
E. None of these

___ 2. The following code is illegal. Rewrite the code using an integer cast in the last line so as to make it legal.

    double d = 187.2;
    int j = d;

A. int j = (cast)d;
B. int j = int (d);
C. int j = int d;
D. int j = (int)d;
E. None of these

___ 3. What is the output of the following?

    System.out.println( 27/5 + 3.1);

A. Illegal, won’t compile
B. 27/5 + 3.1
C. 8
D. 8.5
E. None of these

___ 4. What is the output of the following?

    System.out.println( (double)7/2 + 3.1);

A. 6.6
B. 6.1
C. 6
D. Illegal, won’t compile
E. None of these
MULTIPLE CHOICE

1. ANS: C
   ... it would seem at first glance that A is illegal; however, 5/2 is done with integer arithmetic yielding an
   answer of 2.... and that’s legal to store in int i.
   
   PTS: 1

2. ANS: D  PTS: 1

3. ANS: E
   ... real answer is 8.1

   PTS: 1

4. ANS: A  PTS: 1
Lesson 6 Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Show how we would calculate and print the square root of 139.46
   A. Math.sqrt(139.46);
   B. println(sqrt(139.46));
   C. System.out.println(Math.sqrt(139.46));
   D. (139.46)^(1/2);
   E. None of these

2. Show how we would print the value of pi (3.14159...).
   A. System.out.println(PI.math);
   B. System.out.println("pi");
   C. System.out.println(PI);
   D. System.out.println(Math.pi);
   E. System.out.println(Math.PI);

3. What would the following print if d = 208.4?
   System.out.println(Math.ceil(d));
   A. 209.0
   B. 209
   C. 208.0
   D. 208
   E. None of these

4. Which line of code will calculate (3.1)^4.052 and store the result in double d.
   A. double d = Math.pow(4.052, 3.1);
   B. double d = Math.pow(3.1, 4.052);
   C. double d = 3.1(pow(4.052));
   D. double d = 3.1^(4.052)
   E. None of these
**MULTIPLE CHOICE**

1. ANS: C  
   PTS: 1
2. ANS: E  
   PTS: 1
3. ANS: A  
   PTS: 1
4. ANS: B  
   PTS: 1
Lesson 7 Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What are the three data types that we are able to input from the keyboard?
   A. int, data, server
   B. String, document, file
   C. picture, text, file
   D. String, int, double
   E. None of these

2. Suppose a Scanner object, kbReader, has already been created. Which line of code uses kbReader to input a number with “decimal places” from the keyboard and store the result in the variable, fract.
   A. double fract = kbReader.nextDouble();
   B. double fract = kbReader.next();
   C. double fract = kbReader.nextInt();
   D. double fract = kbReader.nextDbl();
   E. None of these

3. Suppose a Scanner object, kbReader, has already been created. Which line of code uses kbReader to input a quantity like “Jo mamma” from the keyboard and store the result in the variable, name.
   A. String name = kbReader.next();
   B. String name = kbReader.nextLine();
   C. String name = kbReader.nextInt();
   D. String name = kbReader.get();
   E. More than one of these

4. Suppose a Scanner object, kbReader, has already been created. Which line of code uses kbReader to input a number with “no decimal places” from the keyboard and store the result in the variable, count.
   A. int count = kbReader.nextInt();
   B. int count = kbReader.nextInt;
   C. int count = kbReader.nextDouble();
   D. int count = kbReader.next();
   E. More than one of these
Lesson 7 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: D    PTS: 1
2. ANS: A    PTS: 1
3. ANS: B    PTS: 1
4. ANS: A    PTS: 1
Lesson 8 ...Quiz

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

____ 1. What are the two possible values for a `boolean` type variable?
   - A. yes, no
   - B. true, false
   - C. always, never
   - D. nein, ya
   - E. None of these

____ 2. If `boolean p` is `false` what is `!p`?
   - A. false
   - B. Illegal
   - C. Not enough information
   - D. This is a stupid question
   - E. true

____ 3. What is the operator used to indicate Boolean **AND**?
   - A. `||`
   - B. `&&`
   - C. `&`
   - D. `&|`
   - E. `^`

____ 4. What is the operator used to indicate Boolean **OR**?
   - A. `||`
   - B. `&&`
   - C. `&`
   - D. `|`
   - E. `^`

____ 5. Which has higher precedence `&&` or `||`?
   - A. Depends on the context
   - B. `&&`
   - C. `||`
   - D. Precedence is not assigned to these
   - E. They are of equal precedence

____ 6. What is the output of the following code assuming that `p` is `true` and `q` is `false`?

   ```java
   boolean bb = !p || q;
   System.out.println(bb);
   ```
   - A. true
   - B. false
   - C. Illegal, won’t compile
   - D. Need more information
   - E. None of these
Lesson 8 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B  PTS: 1
2. ANS: E  PTS: 1
3. ANS: B  PTS: 1
4. ANS: A  PTS: 1
5. ANS: B  PTS: 1
6. ANS: B  PTS: 1
Lesson 9 _Quiz

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

___ 1. Which is the basic skeleton of an if - else structure?

A. if-else
   
   ```java
   if (
   
   )
   
   }
   
   }
   ```

B. {if(    )
   
   }
   
   {else
   
   }

C. If(    )
   
   {
   
   }
   
   else
   
   {
   
   }

D. If(    )
   
   {
   
   }

E. None of these

___ 2. In the following code, assume that the portion designated with <#1> is a true statement. What will be the output?

```java
if( <#1> )
{
    System.out.print("Elvis");
}
System.out.println(" Presley");
```

A. Elvis
B. ElvisPresley
C. Elvis Presley
D. Presley (has a leading space)
E. None of these

___ 3. In the following code, assume that the portion designated with <#1> is a false statement. What will be the output?

```java
if( <#1> )
```
```java
{
    System.out.print("Elvis");
}
System.out.println(" Presley");
```

A. Elvis               D. Presley (has a leading space)
B. ElvisPresley        E. None of these
C. Elvis Presley

4. If you wanted to compare the contents of two Strings, s1 and s2, which of the following would be appropriate to use?

A. s1.equals(s2)       D. All of the preceding answers
B. s2.equals(s1)       E. s1 == s2
C. s1.equalsIgnoreCase(s2) F. None of these
Lesson 9 Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: C  PTS: 1
2. ANS: C  PTS: 1
3. ANS: D  PTS: 1
4. ANS: D  PTS: 1
Lesson 10 ...Quiz

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

1. In a *switch* statement (switch(??)) what are the two type of variables that may be used in the area designated by?
   A. char, int  
   B. int, double  
   C. char, double  
   D. String, int  
   E. char, String

2. What is the purpose of *default* in a *switch* structure?
   A. Provides for error control  
   B. Provide for anything not specifically covered by one of the cases  
   C. Provides flow control  
   D. *default* is not part of a switch structure  
   E. None of these

```java
int p = ??;
int x = 79;
switch(p)
{
    case 1:
        x = 20;
        break;
    case 2:
        x = 2;
    case 3:
        x = 3;
    default:
        x ++;
}
```

3. If *p = 2* what is the final value of *x in the code above*?
   A. 1  
   B. 2  
   C. 3  
   D. 4  
   E. None of these

4. If *p = 1* what is the final value of *x in the code above*?
   A. 18  
   B. 20  
   C. 22  
   D. 80  
   E. 3
Answer Section

MULTIPLE CHOICE

1. ANS: A PTS: 1
2. ANS: B PTS: 1
3. ANS: D PTS: 1
4. ANS: B PTS: 1
Lesson 11 ...quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

```java
int sum = 0;
for(int j = 0; j < 3; j++)
{
    sum = sum + 2;
}
System.out.println(sum);
```

____ 1. Identify the control expression of the for-loop in the code above.
A. int j = 0  
B. j < 3  
C. j++  
D. int sum = 0;  
E. sum = sum + 2;

____ 2. Identify the step expression of the for-loop in the code above.
A. int j = 0  
B. j < 3  
C. j++  
D. int sum = 0;  
E. sum = sum + 2;

____ 3. Identify the initializing expression of the for-loop in the code above.
A. int j = 0  
B. j < 3  
C. j++  
D. int sum = 0;  
E. sum = sum + 2;

____ 4. What is printed by the code above?
A. 1  
B. 2  
C. 3  
D. 4  
E. None of these

____ 5. How many time does the loop iterate (repeat)?
A. 1  
B. 2  
C. 3  
D. 4  
E. None of these
Lesson 11 ...quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B  PTS: 1
2. ANS: C  PTS: 1
3. ANS: A  PTS: 1
4. ANS: E  
  ... answer is 6
  PTS: 1
5. ANS: C  PTS: 1
Lesson 12 Quiz

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

____ 1. Which code forms the basic skeleton of a `while` loop?

A. `{}
   }
   while( );

B. `{}
   while( );
   }

C. while( );
   {
   }

D. `while( )`
   `{}
   }

E. None of these

____ 2. Which code forms the basic skeleton of a `do-while` loop?

A. `do`
   `{}
   }while( );

B. `do`
   `{`
   `while ( )`
   `}`
   `}

C. `while`
   `{`
   `do( );`
   `}

D. `do`
   `{}
   `while ( )`
   `}

E. None of these

____ 3. What is the effect of `break` when encountered in a loop?

A. The remaining lines of code inside the loop are skipped; however, the loop continues
B. The program ends
C. `break` inside a loop is illegal
D. The loop terminates
E. None of these

____ 4. What is the effect of `continue` when encountered in a loop?
A. The remaining lines of code inside the loop are skipped; however, the loop continues
B. The program ends
C. break inside a loop is illegal
D. The loop terminates
E. None of these

5. What is the difference in a while and a do-while loop?

A. There is no difference. They behave exactly the same.
B. In a while loop, the control expression is at the top of the loop, whereas in a do-while loop, it’s at the bottom.
C. In a do-while loop, the control expression is at the top of the loop, whereas in a while loop, it’s at the bottom.
D. A do-while loop is guaranteed to iterate at least once. A while-loop might not iterate at all.
E. More than one of these
Lesson 12 ... Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: D  PTS:  1
2. ANS: B  PTS:  1
3. ANS: D  PTS:  1
4. ANS: A  PTS:  1
5. ANS: E  PTS:  1
... both B an D

PTS:  1
Lesson 13 Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. What is the ASCII code for ‘B’?

A. 65           D. 98
B. 66           E. None of these
C. 97

___ 2. What is the ASCII code for ‘z’?

A. 89           D. 122
B. 90           E. None of these
C. 121

___ 3. Suppose that \( \text{int} \ j \) is a number that is the ASCII code of a desired character. Which code would print that character?

A. System.out.println(j);
B. System.out.println(Character.convert(j));
C. System.out.println(Character(j));
D. System.out.println((char)j);
E. None of these

___ 4. What single line of code that will convert \( \text{String} \ s \) (a one-character \( \text{String} \)) into \( \text{char} \ \text{ch} \)?

A. char ch = '' + s;
B. char ch = (int)s;
C. char ch = Character(s);
D. char ch = s.charAt(0);
E. None of these

___ 5. Show a single line of code that will convert \( \text{char} \ \text{ch} \) into \( \text{String} \ s \).

A. String s = ch.toString( );
B. String s = "" + ch;
C. String s = ch;
D. More than one of these
E. None of these
Lesson 13 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B     PTS: 1
2. ANS: D     PTS: 1
3. ANS: D     PTS: 1
4. ANS: D     PTS: 1
5. ANS: B     PTS: 1
Lesson 14 ... Quiz

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

___ 1. Convert $100101_{\text{bin}}$ to decimal form.
   
   A. 424  
   B. 89  
   C. 57  
   D. 37  
   E. None of these

___ 2. Convert $3C4_{\text{hex}}$ into decimal form.
   
   A. 2823  
   B. 96  
   C. 964  
   D. 208  
   E. None of these

___ 3. Convert $271_{\text{oct}}$ into decimal form.
   
   A. 185  
   B. 623  
   C. 109  
   D. 67  
   E. None of these

___ 4. What is printed by the following?
   
   \[
   \text{System.out.println(0x4B);} 
   \]
   
   A. 75  
   B. 85  
   C. 95  
   D. 138  
   E. None of these

___ 5. Which line of code converts int $j$ into an equivalent hex String?
   
   A. String $s = \text{Integer.toString(j, 8);}$  
   B. String $s = \text{Integer.toHexstring(j);}$  
   C. String $s = \text{Integer.toString(j, 16);}$  
   D. String $s = \text{Integer.toString(j, hex);}$  
   E. More than one of these
Lesson 14 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: D  PTS: 1
2. ANS: C  PTS: 1
3. ANS: A  PTS: 1
4. ANS: A  PTS: 1
5. ANS: E
   ... both B and C
   
   PTS: 1
Multiple Choice

Identify the choice that best completes the statement or answers the question.

public class Drive
{
    public Drive(String ss)
    {
        <#1>
        miles = 1;
        gas = 1;
    }

    public String getGas( )
    {
        <#2>
    }

    <#3>
    public String carType;
}

____ 1. In the code above, what code replaces <#1> so that the constructor initializes carType to the String value passed to the constructor?

A. carType = Constructor.String;            D. ss = String carType;
B. ss = carType;                             E. None of these
C. carType = ss;

____ 2. In the code above, what code replaces <#3> so as to cause gas and miles to both be publicly available integer instance fields?

A. public int miles, gas;                    D. public stateVars(gas, miles);
B. private int miles gas;                    E. None of these
C. public (int) miles, gas;

____ 3. In the code above, what replaces <#2> so that a binary representation (in String form) of the gas data member is returned.

A. return gas(binaryString);                D. return toString(gas);
B. return Integer.toBinaryString(gas);     E. None of these
C. return getGas(gas);

____ 4. Which line of code (in some other class besides Drive) creates a Drive object called drv. (The String literal, “Chevy” is passed to the constructor. Refer to the code above.)

A. drv = new(“Chevy”);                     D. Drive drv = new Drive(“Chevy”);
B. Drive drv = Drive(“Chevy”);             E. None of these
C. Drive = drv(“Chevy”);
Lesson 15 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: C  PTS: 1
2. ANS: A  PTS: 1
3. ANS: B  PTS: 1
4. ANS: D  PTS: 1
Lesson 16 ...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

```java
public class TvShow {
    public TvShow(String showName, int numMinutes) {
        // ... ...
    }
    public double cost(int i) {
        // ... ...
    }
    // ... other methods and state variables not shown...
}
```

1. Which line of code will instantiate the object `show22` from the `TvShow` class? In the arguments that are passed to its constructor, specify that the number of minutes the show runs as given by the integer variable `x`, and specify that the show name is “Leave it to Beaver”. (Refer to the code above.)

   A. `TvShow show22 = new TvShow(x, “Leave it to Beaver”);`
   B. `TvShow show22 = new TvShow(“Leave it to Beaver”, x);`
   C. `TvShow show22 = TvShow(“Leave it to Beaver”, x);`
   D. `show22 TvShow = new TvShow(“Leave it to Beaver”, x);`
   E. None of these

2. In the `main` method of class `Tester` there is the following line of code immediately following the line of code specified in the above problem.

   ```java
   int var = show22.getNumActors(“male”);
   ```

   There must, of course, be a method named `getNumActors` in the `TvShow` class. Write the signature for this method. (Refer to the `TvShow` class above.)

   A. `public int getNumActors(maleOrFemale)`
   B. `public getNumActors(String maleOrFemale)`
   C. `public int getNumActors(String maleOrFemale)`
   D. `private int getNumActors(String maleOrFemale)`
   E. None of these

3. From within the `main` method of class `Tester`, which line of code uses a `TvShow` object called `show22` to access the `cost` method.

   A. `int dx = show22.cost(3);`
   B. `double dx = show22.cost(3);`
   C. `String dx = show22.cost(3);`
   D. `double dx(3) = show22.cost( );`
   E. None of these
Lesson 16 Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B  PTS: 1
2. ANS: C  PTS: 1
3. ANS: B  PTS: 1
Lesson 17...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What is the output of the following code?

```java
String s1 = “Peter Pan”;
String s2 = “Humpty Dumpty”;
System.out.println(s1.compareTo(s2));
```

A. A positive integer  
B. A negative integer  
C. zero  
D. A number in hex form  
E. None of these

2. What is the output of the following code?

```java
String s1 = “peter pan”;
String s2 = “humpty dumpty”;
System.out.println(s1.compareTo(s2));
```

A. A positive integer  
B. A negative integer  
C. Zero  
D. Infinity  
E. None of these

3. What is the output of the following code?

```java
String s1 = “Peter Pan”;
System.out.println(s1.indexOf(“ter”));
```

A. 1  
B. 2  
C. 3  
D. 4  
E. None of these

4. What is the output of the following code?

```java
String s1 = “ABCCBA”;
System.out.println(s1.lastIndexOf(66));
```

A. 1  
B. 2  
C. 3  
D. 4  
E. None of these

5. What is the output of the following code?

```java
String s1 = “Shakespeare”;  
System.out.println(s1.replace(‘a’, ‘X’));
```

A. ShXkespeare  
D. XXaXXXXXaXX
<table>
<thead>
<tr>
<th>Option</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.</td>
<td>ShXkespeXre</td>
</tr>
<tr>
<td>C.</td>
<td>ShakespeXre</td>
</tr>
<tr>
<td>E.</td>
<td>None of these</td>
</tr>
</tbody>
</table>

Lesson 17 ... Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: A  PTS: 1
2. ANS: A  PTS: 1
3. ANS: B  PTS: 1
4. ANS: D  PTS: 1
5. ANS: B  PTS: 1
Lesson 18 ... Quiz

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

1. How many elements are stored in `double d[]`? Store the answer in an appropriate variable type.

   A. `int i = d.length();`
   B. `int i = d.length;`
   C. `int i = (double)d.length;`
   D. More than one of these
   E. None of these

2. Which line of code will store the odd integers from 1 to 15 in an integer array called `ary`?

   A. `int ary[] = {1,3,5,7,9,11,13,15};`
   B. `int []ary = {1,3,5,7,9,11,13,15};`
   C. `int ary[] = int{1,3,5,7,9,11,13,15};`
   D. More than one of these
   E. None of these

3. Which of the following is a correct way to declare a `String` array?

   A. `String []s;`
   B. `String s[];`
   C. Both A and B
   D. `String s;`
   E. None of these

4. Which of the following is a correct way to pass a `double` array called `dd` to a method called `maxVert`?

   A. `maxVert(double []dd);`
   B. `maxVert(double dd[]);`
   C. `maxVert(dd[]);`
   D. `maxVert(dd);`
   E. Both A and B

5. Which of the following signatures of the method `maxVert` is a correct way to receive as a parameter the `double` array called `vv`?

   A. `public void maxVert(double []vv)`
   B. `public void maxVert(double vv[])`
   C. `public void maxVert(vv[])`
   D. `public void maxVert(vv)`
   E. Both A and B
Lesson 18 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B  PTS: 1
2. ANS: D ...both A and B  PTS: 1
3. ANS: C  PTS: 1
4. ANS: D  PTS: 1
5. ANS: E  PTS: 1
Lesson 19 ... Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. How is the Arrays class used to sort the int a[ ] array?
   A. sort.Arrays(a);
   B. sort.Arrays(a[]);
   C. Arrays.sort(a);
   D. Arrays.sort(a[]);
   E. None of these

2. What is the output of the following code?
   ```java
   int a[] = new int[100];
   a[3] = 511;
   int b[];
   b = a;
   b[3] = 46;
   System.out.println(a[3]);
   ```
   A. 46
   B. 0
   C. 511
   D. Not enough information
   E. None of these

3. What is the output of the following code?
   ```java
   char ch[] = {'0', '1', '2', '3', '4', '5', '6'};
   char xx[] = {'a', 'b', 'c', 'd', 'e', 'f', 'g'};
   System.arraycopy(ch, 1, xx, 2, 3);
   System.out.println(xx[3]);
   ```
   A. 1
   B. 3
   C. 2
   D. d
   E. c

4. Can the logical size of an array ever exceed the physical size?
   A. Yes
   B. No
   C. These terms do not apply to an array
   D. Arrays don’t have a physical size
   E. This is a stupid question
Lesson 19...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: C        PTS: 1
2. ANS: A        PTS: 1
3. ANS: C        PTS: 1
4. ANS: B        PTS: 1
Lesson 20 Quiz

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

___ 1. Static methods are sometimes called what kind of methods?
   
   A. noble  
   B. classical  
   C. abstract  
   D. convoluted  
   E. None of these

___ 2. Class variables are also called what kind of instance fields?
   
   A. classic  
   B. final  
   C. static  
   D. abstract  
   E. None of these

___ 3. Suppose class *Automobile* has a static method called *getMileage* with the following signature:

   ```java
   public static double getMileage(String make, String model)
   ```

   How would you call this method for a Ford Mustang and store the result in *double mpg*?

   A. `double mpg = new Automobile.getMileage("Ford", "Mustang");`
   B. `double mpg = getMileage("Ford", "Mustang");`
   C. `double mpg = Automobile.getMileage("Ford", "Mustang");`
   D. `double mpg = Automobile.getMileage("Mustang", "Ford");`
   E. None of these

___ 4. Consider the call to the *sqrt* method via *Math.sqrt(179.2)*. What evidence is there that *sqrt* is a static method?

   A. It is not necessary to create an object in order to access the method.
   B. The class name, *Math*, precedes the method.
   C. All methods that start with a lower case letter are automatically static.
   D. Both A and B
   E. Both B and C
MULTIPLE CHOICE

1. ANS: E  
   ... answer is *class* variables

   PTS: 1

2. ANS: C  

   PTS: 1

3. ANS: C  

   PTS: 1

4. ANS: D  

   PTS: 1
Lesson 21 ..Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Show how to convert \textit{int} \textit{i} into its wrapper class equivalent.

A. \texttt{Integer iw = new Integer(i);} 
B. \texttt{Integer iw = i;} 
C. \texttt{Integer iw = new WrapperClass(i)} 
D. More than one of these 
E. None of these

____ 2. Show how to convert \textit{Double dw} into its \textit{double} equivalent.

A. \texttt{double d = dw;} 
B. \texttt{double d = dw.doubleValue( );} 
C. \texttt{double d = Double.parseDouble(dw);} 
D. More than one of these 
E. None of these

____ 3. Show how to convert \textit{boolean b} into its wrapper class equivalent using the autoboxing feature of Java 5.0.

A. \texttt{Boolean bw = new b;} 
B. \texttt{Boolean bw = new Boolean(b);} 
C. \texttt{Boolean bw = b;} 
D. \texttt{Boolean bw = b.wrapperClass( );} 
E. None of these

____ 4. Show how to convert \textit{Character cw} into its \textit{char} equivalent using auto-unboxing.

A. \texttt{Character cw = new Character(ch);} 
B. \texttt{char ch = cw;} 
C. \texttt{Character cw = Character(ch);} 
D. \texttt{char cw.unwrap( );} 
E. None of these

____ 5. What is the purpose of wrapper classes?

A. To produce greater accuracy 
B. To increase speed 
C. To allow for leap year 
D. To convert primitive type variables into objects containing the equivalent information 
E. None of these
Lesson 21 Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: D
   ...both A and B. B is for Java 5.0 and higher.
   PTS: 1

2. ANS: D
   ... both A and B. A is for Java 5.0 and higher
   PTS: 1

3. ANS: C  PTS: 1
4. ANS: B  PTS: 1
5. ANS: D  PTS: 1
Lesson 22...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Consider the line of code:

   ```java
   String s = "45";
   ``

   How to is s converted into an int type?

   A. int i = (cast)Integer.parseInt(s);
   B. int i = s;
   C. int i = Integer.parseInt(s);
   D. More than one of these
   E. None of these

2. Consider the line of code:

   ```java
   String s = "2.072";
   ``

   Which code converts s into a double type?

   A. double d = parseDouble(s);
   B. double d = s;
   C. double d = Double.parseDouble(s);
   D. double d = 0.0 + s;
   E. More than one of these

3. Show how to convert int i into a hex String.

   A. String s = Integer.toHexString(i);
   B. String s = Integer.toString(i, 16);
   C. String s = Integer.toString(i, "hex");
   D. String s = Integer.toHexString(i);
   E. More than one of these

4. Show how to convert int i into an octal String.

   A. String s = Integer.toOctalString(i, 8);
   B. String s = new Integer.toString(i, 8);
   C. String s = Integer.toString(i, 8);
   D. String s = String.toString(i, 8);
   E. None of these

5. Show how to convert int i into a binary String.

   A. String s = Integer.toBinaryString(i);
   B. String s = Integer.toBinString(i);
   C. String s = Integer.toBinaryString(i, 2);
   D. String s = toBinaryString(i, 2);
   E. None of these
Lesson 22 Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: C  PTS: 1
2. ANS: C  PTS: 1
3. ANS: E  
...both A and B  
   PTS: 1
4. ANS: C  PTS: 1
5. ANS: A  PTS: 1
Lesson 23 ...Quiz
Multiple Choice
Identify the choice that best completes the statement or answers the question.
____

1. What import is necessary before using the StringTokenizer class?
A. import java.nerd.*
B. import java.util.*;
C. import java.io.*;

____

D. import java.text.*;
E. None of these

2. How many tokens does the following String have if only blanks are considered as delimiters?

“Star-spangled banner”
A. 0
B. 1
C. 2
____

D. 3
E. 4

3. What method of the StringTokenizer class is used to determine if there are any more tokens left?
A. moreTokens( )
B. hasMoreTokens( )
C. countTokens( )

____

D. gotMore( )
E. More than one of these

4. What code will create a StringTokenizer object tok from the String object str. In the creation of this

object, also specify that the delimiters are to be a dash and a question mark.
A.
B.
C.
D.
E.
____

StringTokenizer tok = new StringTokenizer(str, “-”, “?”);
StringTokenizer tok = new StringTokenizer(str, “-?”);
StringTokenizer tok = new StringTokenizer(“-?”, str);
StringTokenizer tok = strStringTokenizer(str, “-?”);
None of these

5. What is output by the following code?

StringTokenizer st = new StringTokenizer(“Dude, where’s my car?”);
String str = st.nextToken( );
str = st.nextToken( );
System.out.println(str);
A. Dude
B. where’s
C. my

D. car
E. None of these


Lesson 23 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B  PTS: 1
2. ANS: C  PTS: 1
3. ANS: E
...both B and C  
   PTS: 1
4. ANS: B  PTS: 1
5. ANS: B  PTS: 1
Lesson 24 ... Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. Show how to use the Scanner class to create a Scanner scr object that could be used to read lines of text from the file `C:\MyData\Data1.txt`.

A. Scanner scr = new Scanner(new File(“C:\MyData\Data1.txt”));
B. Scanner scr = new Scanner(new File(“C:\MyData\Data1.txt”));
C. Scanner scr = new Scanner(new File(“C://MyData//Data1.txt”));
D. Scanner scr = new Scanner(“C:\MyData\Data1.txt”);
E. Scanner scr = new Scanner(File(“C:\MyData\Data1.txt”));

___ 2. How would you use an scr object that reads a disk file to read a line of text from that file and store it in String s?

A. String s = scr.nextLine();
B. String s = scr.next();
C. String s = scr.nextLine;
D. String s = nextLine(scr);
E. None of these

___ 3. What import is needed for the Scanner class?

A. import java.io.*;
B. import java.text.*;
C. import java.nerdstuff.*;
D. import java.awt.*
E. None of these

___ 4. After you open a file and you are finished inputting from the file, what’s the last thing you should do with the Scanner object?

A. Delete the file with scr.delete();
B. Append the file with scr.append();
C. Close the file with scr.close();
D. Renew the file with scr.renew();
E. None of these

___ 5. Suppose you use the File class in `main` and since its object is capable of throwing an IOException, show how you would modify the signature of `main` so as to accommodate this possibility.

A. public throws IOException static void main(String args[])
B. public static void main(String args[]) throw IOException
C. public static void main(String args[]) throws IOException;
D. public static void main(String args[]) throws IOException
E. None of these
MULTIPLE CHOICE

1. ANS: B  PTS: 1
2. ANS: A  PTS: 1
3. ANS: E  
   ... import java.util.*;
   
   PTS: 1
4. ANS: C  PTS: 1
5. ANS: D  PTS: 1
Lesson 25 ...Quiz

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

Consider the file `A:\NumData.in` with the following content:

```
56  37  22  –18
2
17  82  9
1  2  3  8  11  181
...
```

The above file is input and processed by the following code:

```java
public static void main(String args[]) throws IOException
{
    Scanner sf = new Scanner(new File("A:\\NumData.in"));
    int maxIndx = -1;
    String text[] = new String[100];
    while(sf.hasNext( ))
    {
        maxIndx++;
        text[maxIndx] = sf.nextLine( );
    }
    sf.close( );

    for (int j = 0; j <= maxIndx; j++)
    {
        Scanner sc = new Scanner( text[j] );
        while(sc.hasNext( ))
        {
            int k = sc.nextInt( );
            … do something with k …
        }
    }
}
```

**1.** What code above is responsible for handling the unpredictable number of lines of text in the file?

A. `sc.hasNext( )`  
B. `sf.hasNext( )`  
C. `throws IOException`  

**2.** What code above is responsible for handling the unpredictable number of integers on each line of text?

A. `sc.hasNext( )`  
B. `sf.hasNext( )`  
C. `throws IOException`  
D. `String text[] = new String[100];`  
E. `Scanner sc = new Scanner( text[j] );`
A. `sc.hasNext()`  
B. `sf.hasNext()`  
C. `throws IOException`  
D. `String text[] = new String[100];`  
E. `Scanner sc = new Scanner( text[j] );`
Lesson 25 Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B    PTS: 1
2. ANS: A    PTS: 1
Lesson 26 ...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Show how to use the FileWriter and PrintWriter classes to create a PrintWriter pw object that could be used to write lines of text to the file C:\MyData\Data1.txt.

A. FileWriter fw = new FileWriter("C:\MyData\Data1.txt");
   PrintWriter pw = new PrintWriter(fw);

B. FileWriter fw = new FileWriter("C:\MyData\Data1.txt");
   PrintWriter pw = PrintWriter(fw);

C. FileWriter fw = PrintWriter("C:\MyData\Data1.txt");
   PrintWriter pw = PrintWriter(fw);

D. FileWriter fw = PrintWriter("C:\MyData\Data1.txt");
   PrintWriter pw = new PrintWriter( new fw);

E. None of these

2. How would you use the pw object from the previous problem to write String s to the Data1.txt file?

A. s.println( pw);
B. pw.print(s);
C. pw.System.out.println(s);
D. pw.println(s);
E. None of these

3. What import is needed for the FileWriter and PrintWriter classes?

A. import java.util.*;
B. import java.text.*;
C. import java.io.*;
D. import java.language.*
E. None of these

4. Why is it so important to close a file that has been opened with FileWriter?

A. It’s not important.
B. This prevents the computer from spinning the hard disk excessively.
C. This prevents the computer from running low on memory.
D. Some of the information “written” to the file may not actually be sent to the file until the file is closed.
E. None of these
MULTIPLE CHOICE

1. ANS: A  PTS: 1
2. ANS: D  PTS: 1
3. ANS: C  PTS: 1
4. ANS: D  PTS: 1
Lesson 27 Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Show how to create a `NumberFormat` object.
   
   A. `NumberFormat nf = new NumberFormat.getNumberInstance();`
   B. `NumberFormat nf = new NumberFormat();`
   C. `NumberFormat nf = new NumFmt.getNumberInstance();`
   D. More than one of these
   E. None of these

2. Look at the following table and write code that would format the printout of `double d1` so that it would be consistent with the table. Your code should produce a formatted printout of `d1`.

<table>
<thead>
<tr>
<th><code>double d1</code></th>
<th>Formatted output</th>
</tr>
</thead>
<tbody>
<tr>
<td>187.206912</td>
<td>187.207</td>
</tr>
<tr>
<td>180.0</td>
<td>180.00</td>
</tr>
</tbody>
</table>

   A. `NumberFormat nf = NumberFormat.getNumberInstance();
      nf.setMaximumFractionDigits(3);
      nf.setMinimumFractionDigits(2);
      System.out.println(nf.format(d1));`
   B. `NumberFormat nf = NumberFormat.getNumberInstance();
      nf.setMaximumFractionDigits(2);
      nf.setMinimumFractionDigits(3);
      System.out.println(nf.format(d1));`
   C. `NumberFormat nf = NumberFormat.getNumberInstance();
      nf.setMaximumFractionDigits(3);
      nf.setMinimumFractionDigits(3);
      System.out.println(nf.format(d1));`
   D. `NumberFormat nf = NumberFormat.getNumberInstance();
      nf.maxFractionDigits(3);
      nf.minFractionDigits(2);
      System.out.println(nf.format(d1));`
   E. None of these

3. What class would you use if you wish to format numerical output with a pattern like “#,###.000”?

   A. `Math`  
   B. `String`  
   C. `NumberFormat`  
   D. `DecimalFormat`  
   E. None of these
Lesson 27: Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: E
   ... answer is  NumberFormat nf = NumberFormat.getNumberInstance();
   PTS: 1

2. ANS: A  PTS: 1

3. ANS: D  PTS: 1
Lesson 28 Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What symbol indicates a bitwise **AND**?
   
   A. `&&`
   B. `&`
   C. `||`
   D. `|`
   E. `^`

2. What symbol indicates a bitwise **OR**?
   
   A. `&&`
   B. `&`
   C. `||`
   D. `|`
   E. `^`

3. What symbol indicates a bitwise **NOT**?
   
   A. `!`
   B. `~`
   C. `||`
   D. `|`
   E. `^`

4. Do a bitwise **AND** between the following two binary numbers.
   
   \[
   \begin{align*}
   &1001101 \\
   \text{AND} \\
   &1000111
   \end{align*}
   \]
   
   A. 1000101
   B. 1001111
   C. 1000010
   D. 1000001
   E. None of these

5. Do a bitwise **OR** between the following two binary numbers.
   
   \[
   \begin{align*}
   &1001101 \\
   \text{OR} \\
   &1000111
   \end{align*}
   \]
   
   A. 1000101
   B. 1001111
   C. 1000010
   D. 1000001
   E. None of these

6. What is output by the following code?
   
   ```java
   System.out.println(~103 > 0);
   ```
   
   A. -103
   B. `true`
   C. `false`
   D. `!103`
   E. None of these
Lesson 28 Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B  PTS: 1
2. ANS: D  PTS: 1
3. ANS: B  PTS: 1
4. ANS: A  PTS: 1
5. ANS: B  PTS: 1
6. ANS: C  PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What is output by:
   \[ \text{System.out.println}(8<<3); \]
   A. 0
   B. 1
   C. 64
   D. 24
   E. None of these

2. What is output by:
   \[ \text{System.out.println}(64>>2); \]
   A. 128
   B. 256
   C. 32
   D. 16
   E. None of these

3. What is output by:
   \[ \text{System.out.println}(-64>>2); \]
   A. 128
   B. 256
   C. -32
   D. 16
   E. -16

4. Whereas \((f>3) && (n--<2))\) means boolean AND with short-circuiting, what does \((f>3) & (n++<-2))\) mean?
   A. boolean AND without short-circuiting
   B. bitwise AND without short-circuiting
   C. bitwise AND with short-circuiting
   D. It is illegal
   E. None of these

5. Which has higher precedence, \& or |?
   A. &
   B. |
   C. They are of equal precedence and would therefore be executed in a left-to-right order
   D. Precedance does not apply
   E. Depends on the context of the problem
Lesson 29 ..Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: C    PTS: 1
2. ANS: D    PTS: 1
3. ANS: E    PTS: 1
4. ANS: A    PTS: 1
5. ANS: A    PTS: 1
Lesson 30 ... Quiz

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

1. Which line of code will create an object that could be used to create random numbers?

   A. Random rd = new RandomInt();
   B. Random rd = new Random();
   C. Random rd = Random();
   D. Random rd = new RandomDouble();
   E. None of these

2. Assuming a Random rd object already exists, which line of code will generate integers in the range from `Integer.MIN_VALUE` to `Integer.MAX_VALUE`?

   A. int i = rd.nextInt(0);
   B. int i = new rd.nextInt();
   C. int i = rd.nextInt();
   D. int i = rd.nextInt(Integer.MIN_VALUE, Integer.MAX_VALUE);
   E. None of these

3. Assuming Random rd already exists, which line of code will generate integers in the range from 0 (inclusive) to 100 (inclusive)?

   A. int i = rd.nextInt(101);
   B. int i = rd.nextInt(100);
   C. int i = rd.nextInt(99);
   D. int i = rd.nextInt(0, 100);
   E. None of these

4. Assuming a Random rd object already exists, which line of code will generate doubles in the range from 0 (inclusive) to 1 (exclusive)?

   A. double d = rd.nextDouble(1);
   B. double d = rd.nextDouble();
   C. double d = rd.nextDouble(0, 1);
   D. double d = new rd.nextDouble();
   E. None of these
Lesson 30...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B      PTS: 1
2. ANS: C      PTS: 1
3. ANS: A      PTS: 1
4. ANS: B      PTS: 1
Lesson 31 Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. How do you convert the contents of StringBuffer sb to String s?
   A. String s = new StringBuffer.toString( );
   B. String s = new StringBuffer.toString(sb);
   C. String s = StringBuffer.toString(sb);
   D. String s = toString( sb);
   E. String s = sb.toString( );

2. Is it possible to place a String into a StringBuffer object at the time of creation of that object? If so, how?
   A. No, never
   B. Yes
      String s = “Hello”;
      StringBuffer sb = new StringBuffer(s);
   C. No, if it’s a leap year
   D. No if the String has no alphabetical characters
   E. None of these

3. Assuming that sb is a StringBuffer object that already contains String data equivalent to “Rubber”. Which line of code can change the contents to the equivalent of “Rubber Ducky”?
   A. sb.add(“Rubber”<--“ Ducky”);
   B. sb.append(“Rubber”, “ Ducky”);
   C. sb.append(“ Ducky”);
   D. sb.add(“ Ducky”);
   E. None of these

4. If a colleague in your software development group complains that his code is running very slowly and you are aware that he is concatenating many strings in loops that iterate many times, what would you suggest he do?
   A. Write more efficient code
   B. Use string buffers
   C. Get a job in accounting
   D. Avoid concatenating very short strings
   E. None of these
MULTIPLE CHOICE

1. ANS: E  PTS:  1
2. ANS: B  PTS:  1
3. ANS: C  PTS:  1
4. ANS: B  PTS:  1
Lesson 32 Quiz

**Multiple Choice**
Identify the choice that best completes the statement or answers the question.

___ 1. Rewrite $x \&\& (y \| z)$ with “+” and “*” where $x$, $y$, and $z$ are boolean variables.

   A. $(x \ast y) + z$
   B. $x + (y \ast z)$
   C. $x \ast (y + z)$
   D. $(x + y) \ast z$
   E. None of these

___ 2. Apply DeMorgan’s Theorem to:

   $!(p + z)$

   A. $\neg p \ast \neg z$
   B. $p! \ast z!$
   C. $!p \ast !z$
   D. $!p + !z$
   E. None of these

___ 3. Apply DeMorgan’s Theorem to:

   $!(p \ast !q)$

   A. $p + !q$
   B. $!p + q$
   C. $!p \ast q$
   D. $p \ast !q$
   E. None of these

___ 4. If $b$ is a boolean variable, simplify:

   $b \ast true$

   A. $b$
   B. $!b$
   C. true
   D. false
   E. None of these

___ 5. If $b$ is a boolean variable, simplify:

   $b + true$

   A. $b$
   B. $!b$
   C. true
   D. false
   E. None of these
Lesson 32...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: C  PTS: 1
2. ANS: C  PTS: 1
3. ANS: B  PTS: 1
4. ANS: A  PTS: 1
5. ANS: C  PTS: 1
Lesson 33 ... Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Which is the most recommended, use of “if – else”, or use of the “selection operator”?
   A. if-else
   B. selection operator
   C. Neither. They are both outdated
   D. The two are not interchangeable
   E. None of these

2. Rewrite the following using the selection operator:
   String s;
   if(bol)
   {
     s = “global positioning system”;
   }
   else
   {
     s = “gps”;
   }
   A. String s = bol? “gps” : “global positioning system”;
   B. String s = = bol? “global positioning system” : “gps”;
   C. String s = bol: “global positioning system” ? “gps”;
   D. String s = bol? “global positioning system” : “gps”;
   E. None of these

3. Rewrite the following using an if-else structure:
   double d = (b >= 37)? Math.pow(3.2,3.55) : 37.2;
   A. double d;
      if(b >=37)
      {
        d = Math.pow(3.2, 3.55);
      }
      else
      {
        d = 37.2;
      }
   B. double d;
      if(b >=37)
      {
        d = 37.2;
      }
   D. More than one of these
   E. None of these
C. double d = 37.2;
   if(b >= 37) {
       d = Math.pow(3.2, 3.55);
   }
Lesson 33 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: A  PTS: 1
2. ANS: D  PTS: 1
3. ANS: E  
   ... both A and C

   PTS: 1
Lesson 34 ...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___  1. Is an *int* type passed by reference or by value to a method?
   A. reference  
   B. value  
   C. neither

___  2. Is a *double* type passed by reference or by value to a method?
   A. reference  
   B. value  
   C. neither

___  3. Is a *String* passed by reference or by value to a method?
   A. reference  
   B. value  
   C. neither

___  4. Is a *BankAccount* object passed by reference or by value to a method?
   A. reference  
   B. value  
   C. neither

___  5. An *int[ ]* array is passed as an argument to a method. The signature of the method is:
   
   ```java
   public String calc(int b[])
   ```

Which of the following is true?

   A. A new b array is created
   B. b is just a reference back to the original a array.
   C. Changes in b do not affect a.
   D. The a array is passed by value to the calc method.
   E. None of these

___  6. An original variable in some “calling code” is passed by value to a method. The original variable is...

   A. …not modified when the corresponding value in the method is changed.
   B. …modified when the corresponding value in the method is changed.
MULTIPLE CHOICE

1. ANS: B   PTS: 1
2. ANS: B   PTS: 1
3. ANS: B   PTS: 1
4. ANS: A   PTS: 1
5. ANS: B   PTS: 1
6. ANS: A   PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Show how to create a doubly subscripted double array that would represent the following arrangement.

\[
\begin{array}{ccc}
123.0 & 1.045 & 72.9201 \\
-262.02 & 2.0 & -92.28 \\
\end{array}
\]

A. double d[][] = {{123.0, 1.045, 72.9201, -262.02, 2.0, -92.28}};
B. double d[][] = {{123.0, -262.02}, {1.045, 2.0}, {72.9201, -92.28}};
C. double d[][] = {{123.0, 1.045, 72.9201},
                    {-262.02, 2.0, -92.28}};
D. More than one of these
E. None of these

2. Show how to determine the number of rows in the two-dimensional integer array, int z[][].

A. length.z
B. length.z( )
C. z.length( )
D. z.length
E. None of these

3. Show how to determine the number of columns in a two-dimensional array, double d[][].

A. d[0].length
B. d[].length
C. d.length
D. d.length(0)
E. None of these

4. Is it possible to have an array whose rows have differing numbers of columns?

A. Yes
B. No
Lesson 35...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: C     PTS: 1
2. ANS: D     PTS: 1
3. ANS: A     PTS: 1
4. ANS: A     PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

<table>
<thead>
<tr>
<th>Class Name</th>
<th>Public methods</th>
<th>Private methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polygon</td>
<td>perimeter</td>
<td>numVertices</td>
</tr>
<tr>
<td></td>
<td>area</td>
<td></td>
</tr>
<tr>
<td>Triangle</td>
<td>side1</td>
<td>angle1</td>
</tr>
<tr>
<td></td>
<td>side2</td>
<td>angle2</td>
</tr>
<tr>
<td></td>
<td>side3</td>
<td>angle3</td>
</tr>
</tbody>
</table>

1. How you would write the header (signature) for the Triangle class so that it inherits the Polygon class? (Refer to the code above.)

   A. public class Polygon inherits Triangle   D. public class Triangle extends Polygon
   B. public class Triangle inherits Polygon    E. None of these
   C. public class Polygon extends Triangle

2. Assume that the Triangle class inherits the Polygon class, that ply is a Polygon object, and that tri is a Triangle object. Furthermore, assume that all these objects have been created and are used from within some other class that is unrelated to the Triangle and Polygon classes. Is the following legal? (Refer to the code above.)

   tri.side1( )

   A. Yes   B. No

3. Assume that the Triangle class inherits the Polygon class, that ply is a Polygon object, and that tri is a Triangle object. Furthermore, assume that all these objects have been created and are used from within some other class that is unrelated to the Triangle and Polygon classes. Is the following legal? (Refer to the code above.)

   tri.perimeter( )

   A. Yes   B. No

4. Assume that the Triangle class inherits the Polygon class, that ply is a Polygon object, and that tri is a Triangle object. Furthermore, assume that all these objects have been created and are used from within some other class that is unrelated to the Triangle and Polygon classes. Is the following legal? (Refer to the code above.)

   tri.numVertices( )

   A. Yes   B. No
5. Assume that the Triangle class inherits the Polygon class, that ply is a Polygon object, and that tri is a Triangle object. Furthermore, assume that all these objects have been created and are used from within some other class that is unrelated to the Triangle and Polygon classes. Is the following legal? (Refer to the code above.)

   ply.area( )

A. Yes  B. No

6. Assume that the Triangle class inherits the Polygon class, that ply is a Polygon object, and that tri is a Triangle object. Furthermore, assume that all these objects have been created and are used from within some other class that is unrelated to the Triangle and Polygon classes. Is the following legal? (Refer to the code above.)

   ply.numVertices( )

A. Yes  B. No

7. Assume that the Triangle class inherits the Polygon class, that ply is a Polygon object, and that tri is a Triangle object. Furthermore, assume that all these objects have been created and are used from within some other class that is unrelated to the Triangle and Polygon classes. Is the following legal? (Refer to the code above.)

   ply.side3( )

A. Yes  B. No
Lesson 36...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: D  PTS: 1
2. ANS: A  PTS: 1
3. ANS: A  PTS: 1
4. ANS: B  PTS: 1
5. ANS: A  PTS: 1
6. ANS: B  PTS: 1
7. ANS: B  PTS: 1
Lesson 37 ... Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What is the technique by which the handling of an IOException is deferred “up the calling chain”?
   A. Append throws IOException to the signature of the class in which the exception could possibly occur.
   B. Append throws IOException to the signature of the method in which the exception could possibly occur.
   C. Both of these
   D. None of these

2. What are the two types of exceptions? Which of these two must be “handled”?
   A. fatal and nonFatal (must be handled)
   B. fatal (must be handled) and nonFatal
   C. checked (must be handled) & unchecked
   D. checked & unchecked (must be handled)
   E. None of these

3. Of the two categories of exceptions, which is IOException?
   A. fatal
   B. nonFatal
   C. checked
   D. unchecked
   E. None of these

4. Of the two categories of exceptions, which is NumberFormatException?
   A. fatal
   B. nonFatal
   C. checked
   D. unchecked
   E. None of these

5. If a method throws an exception class up the calling chain, then all of its subclasses are automatically thrown as well.
   A. True
   B. False

6. If a try statement is present, then both catch and finally must also be present.
   A. True
   B. False
Lesson 37 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B  PTS: 1
2. ANS: C  PTS: 1
3. ANS: C  PTS: 1
4. ANS: D  PTS: 1
5. ANS: A  PTS: 1
6. ANS: B  PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What is the signature for the Ford class so that it will be forced to implement the Car interface?
   A. public class Ford extends Car  
   B. public class Ford inherits Car  
   C. public class Ford uses Car  
   D. public class Ford finalizes Car  
   E. None of these

2. The property of two methods having the same name but with possibly different implementations (in different classes) is known as which of the following?
   A. similarity  
   B. polymorphism  
   C. inheritance  
   D. overriding  
   E. None of these

3. Saying that a class realizes an interface is the same as saying that it does what to the interface.
   A. uses  
   B. inherits  
   C. implements  
   D. extends  
   E. None of these

4. Suppose that the class Bank implements the two interfaces Accounting and Personnel. It also inherits the class Financial. Write the signature for the Bank class.
   A. public class Bank extends Accounting, Personnel implements Financial  
   B. public class Bank implements Accounting, Personnel extends Financial  
   C. public class Bank extends Financial implements Accounting, Personnel  
   D. None of these

5. Write the code for an interface called Trigonometry that has a method called sin that both receives and returns a double. It has another method called convertToRadians that takes an integer parameter. It returns a double.
   A. public interface Trigonometry
      {
         double sin(double theta){ }
         double convertToRadians(int degrees){ }
      }
   B. public interface Trigonometry
      {
         double sin(double theta);
         double convertToRadians(int degrees);
      }
   C. public interface Trigonometry
      {
         double sin(double theta)
         double convertToRadians(int degrees)
D. public interface Trigonometry
   {
       int sin(double theta);
       int convertToRadians(double degrees);
   }

E. None of these
MULTIPLE CHOICE

1. ANS: E
   ... real answer is  
   public class Ford implements Car

   PTS: 1

2. ANS: B  PTS: 1
3. ANS: C  PTS: 1
4. ANS: C  PTS: 1
5. ANS: B  PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What Big O value does a time complexity analysis of the following code yield?
   ```java
   for(int j = 0; j < n; j++)
   {
   for(k = 0; k < n + 100; k++)
   { ...
some code... 
   }
   }
   ```
   - A. O(n)
   - B. O(n^2)
   - C. O(log n)
   - D. O(nlog n)
   - E. None of these

2. What Big O value does a time complexity analysis of the following code yield?
   ```java
   for(int j = 0; j < n - 20; j+= 22)
   { 
   for(k = n; k > 0; k--)
   { 
   ...
some code...
   }
   }
   ```
   - A. O(n)
   - B. O(n^2)
   - C. O(log n)
   - D. O(nlog n)
   - E. None of these

3. What Big O value does a time complexity analysis of the following code yield?
   ```java
   for(int j = 1; j <= n; j*=2)
   { 
   for(k = 0; k < n + 100; k++)
   { 
   ...
some code...
   }
   }
   ```
   - A. O(n)
   - B. O(n^2)
   - C. O(log n)
   - D. O(nlog n)
   - E. None of these

4. What Big O value does a time complexity analysis of the following code yield?
for(int j = n + 1; j >0; j/=2) {
    …some code…
}

  A. O(n)          D. O(nlog n)
  B. O(n²)         E. None of these
  C. O(log n)

5. What is the Big O value for a sequential (linear) search of a list of names?

  A. O(n)          D. O(nlog n)
  B. O(n²)         E. None of these
  C. O(log n)

6. What is the Big O value for a binary search of an ordered list?

  A. O(n)          D. O(nlog n)
  B. O(n²)         E. None of these
  C. O(log n)
Lesson 39...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B  PTS: 1
2. ANS: B  PTS: 1
3. ANS: D  PTS: 1
4. ANS: C  PTS: 1
5. ANS: A  PTS: 1
6. ANS: C  PTS: 1
Lesson 40 „Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. What is the value of 5! (five factorial)?
   A. 129
   B. 15
   C. 5
   D. 0
   E. None of these

___ 2. What is returned by method(8)?

   ```java
   public static int method(int n)
   {
     if(n == 5)
     {
       return 20;
     }
     else
     {
       return n + method(n - 1);
     }
   }
   ```

   A. 40
   B. 41
   C. 42
   D. 43
   E. None of these

___ 3. What is returned by method(1)?

   ```java
   public static int method(int n)
   {
     if(n > 5)
     {
       return n - 1;
     }
     else
     {
       return n * method(n + 2);
     }
   }
   ```

   A. 70
   B. 80
   C. 90
   D. 100
   E. None of these
Lesson 40 „Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: E
   ... 120 is the answer
   PTS: 1

2. ANS: B
   PTS: 1

3. ANS: C
   PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Is the following is a Selection Sort or an Insertion Sort?

   ```java
   public static void sort(int a[]) {
       int x, j;
       boolean keepGoing;
       for (int k = 1; k < a.length; k++) {
           itemToInsert = a[k];
           j = k - 1;
           keepGoing = true;
           while ((j >= 0) && keepGoing) {
               if (x < a[j]) {
                   a[j + 1] = a[j];
                   j--;
                   if (j == -1) {
                       a[0] = x;
                   }
               } else {
                   keepGoing = false;
                   a[j + 1] = x;
               }
           }
       }
   }
   ```

   A. Selection sort  
   B. Insertion sort

2. Is the following is a Selection Sort or an Insertion Sort?

   ```java
   public static void sort(int a[]) {
       int min, minIndex;
       for (int i = 0; i < a.length; ++i) {
           min = a[i];
           minIndex = i;
           for (int j = i + 1; j < a.length; ++j) {
               if (a[j] < min) { //salient feature
                   min = a[j];
               }
           }
       }
   }
   ```
minIndex = j;
}
}
a[minIndex] = a[i];
a[i] = min;
}

A. Selection sort

B. Insertion sort

3. What code swaps the contents of the int variables x and y.

A. int temp = x;
   x = y;
   x = temp;

B. int temp = x;
   x = y;
   y = temp;

C. int temp = x;
   temp = y;
   y = temp;

D. int temp = x;
   x = y;
   temp = y;

E. None of these
Lesson 41A ...Quiz (Selection and Insertion Sorts)
Answer Section

MULTIPLE CHOICE

1. ANS: B  PTS: 1
2. ANS: A  PTS: 1
3. ANS: B  PTS: 1
Lesson 41B Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Does the following describe a Merge Sort or Quick Sort?

This sort begins by placing each element into its own individual list. Then each pair of adjacent lists is combined into one sorted list. This continues until there is one big, final, sorted list.

A. Merge Sort  
B. Quick Sort

____ 2. Does the following describe a Merge Sort or Quick Sort?

This sort begins by breaking the original list into two partitions (sections) based on the value of some “pivot value.” One partition will eventually contain all the elements with values greater than the pivot value. The other will eventually contain all the elements with values less than or equal to the pivot value. Repeat this process on each partition.

A. Merge Sort  
B. Quick Sort

____ 3. Identify the following as a Merge Sort or Quick Sort.

public static void sort (int a[], int left, int right)
{
    if (right == left) return;
    int middle = (left + right) /2;
    sort(a, left, middle);
    sort(a, middle + 1, right);
    combine(a, left, middle, right);
}

A. Merge Sort  
B. Quick Sort

____ 4. Identify the following as a Merge Sort or Quick Sort.

public static void sort(int a[], int left, int right)
{
    if (left >= right) return;
    int k = left;
    int j = right;
    int centVal = a[(left + right) / 2];
    while ( k < j )
    {
        while (a[k] < centVal)
        {
            k++;
        }
        while (centVal < a[j])
        {
            j--;
        }
    }
}
if (k <= j) {
    int temp = a[k];
    a[k] = a[j];
    a[j] = temp;
    k++;
    j--;
}
}
sort(a, left, j);
sort(a, k, right);

A. Merge Sort

B. Quick Sort
Lesson 41B ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: A  PTS: 1
2. ANS: B  PTS: 1
3. ANS: A  PTS: 1
4. ANS: B  PTS: 1
Lesson 42 Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What is the only data type that resides in List objects?
   A. Object type objects
   B. int
   C. double
   D. String
   E. None of these

2. Which is the proper way to instantiate a List object that is implemented as an ArrayList?
   A. List lst = ArrayList();
   B. List lst = new ArrayList();
   C. ArrayList lst = new ArrayList();
   D. More than one of these
   E. None of these

Multiple Response
Identify one or more choices that best complete the statement or answer the question.

3. What three java.util classes implement the List interface?
   A. Stack
   B. LinkedList
   C. ArrayList
   D. Queue
   E. Vector
Lesson 42 Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: A  PTS: 1
2. ANS: D
   ...both B and C  
   PTS: 1

MULTIPLE RESPONSE

3. ANS: B, C, E  PTS: 1
Lesson 43 ...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

For the following problems assume that we have an object, aryLst, created as follows:

List aryLst = new ArrayList();

Even though parameter types are not used in the instantiation of the object above, assume that only wrapper class Integer types are to be stored in aryLst.

____ 1. Assume j is an int type. What code will add it to the end of the aryLst object? (Refer to the code above.)

A. Integer jw = j;  
B. Integer jw = new Integer();  
   aryLst.add(jw); 
C. jw.add(aryLst);

____ 2. What code will retrieve the number stored at index 15 of aryLst and store it in int x?

A. Object obj = aryLst.get(15);  
   Integer xw = (Integer)obj;  
   int x = xw; 
B. Object obj = aryLst.get(15);  
   Integer xw = (Integer)obj;  
   int x = xw.intValue();  
C. int x = aryLst.get(15);  

D. A and B  
E. A, B, and C 

____ 3. What is the simplest way to completely empty the aryLst list?

A. aryLst.clear();  
B. aryLstEmpty();  
C. aryLst.numEntries(0);  
D. aryLst.null  
E. None of these
MULTIPLE CHOICE

1. ANS: D
   ... both A and B
   PTS: 1

2. ANS: E    PTS: 1

3. ANS: A    PTS: 1
Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. What is the index of the iterator in the following list if the comma indicates the position of the iterator?
   
   A B C, D E

   A. 1
   B. 2
   C. 3
   D. 3
   E. None of these

2. Suppose we have a List object called myList. How would it be used to create an Iterator object?

   A. Iterator itr = new Iterator( );
   B. Iterator itr = myList.itr( );
   C. Iterator itr = myList.iterator( );
   D. More than one of these
   E. None of these

3. Which is the most robust interface, Iterator or ListIterator?

   A. Iterator
   B. ListIterator

4. Is it acceptable practice to use multiple iterators simultaneously on the same list?

   A. Yes
   B. No
Multiple Choice

1. ANS: D  PTS:  1
2. ANS: C  PTS:  1
3. ANS: B  PTS:  1
4. ANS: B  PTS:  1
Lesson 45 ... Quiz

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

1. What is the only method of the *Comparable* interface?
   - A. Compare
   - B. CompareTo
   - C. compareTo
   - D. compare
   - E. None of these

2. What is printed by the following code?
   ```java
   Integer iw = new Integer(108); //Java 5.0, Integer iw = 108;
   Integer ij = new Integer(92); //Java 5.0, Integer ij = 92;
   int i = iw.compareTo(ij);
   System.out.println(i);
   ```
   - A. positive number
   - B. negative number
   - C. zero
   - D. zero

3. Suppose there is a *Bridge* class from which objects are created that we wish to sort in some unique way by using a *sort* method in the *Arrays* class. You are not permitted to create a `compareTo` method in the *Bridge* class or to modify it in any way. What approach should you take so that the *Arrays.sort* method will sort the *Bridge* objects in this “unique way”?
   - A. Use `Array.compareTo()`.  
   - B. It can’t be done
   - C. Use `Arrays.compare()`.  
   - D. Create a *Comparator* object and pass it to the *sort* method.
Lesson45 Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: C  PTS: 1
2. ANS: A  PTS: 1
3. ANS: D  PTS: 1
Lesson 46 ...Quiz

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

_____ 1. Which is the correct way to instantiate `Set s`?

A. `Set s = new HashSet( );`  
B. `Set s = new TreeSet( );`  
C. `Set s = new SetTree( );`  
D. `Set s = new SetHash( );`  
E. More than one of these

_____ 2. What is the only data type that can reside in a `Set` object?

A. String object  
B. Object type object  
C. Wrapper class object  
D. Any object type

_____ 3. Will an `Iterator` necessarily step through the objects in a `Set` in the same order in which they were added to the `Set`?

A. Yes  
B. No

_____ 4. Which is the correct way to create an `Iterator` object for `Set s`?

A. `Iterator itr = s.iterator( );`  
B. `Iterator itr = iterator(s);`  
C. `Iterator itr = new Iterator( );`  
D. `Iterator itr = new Iterator(S);`  
E. None of these
Lesson 46 ... Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: E
   ... both A and B
   PTS: 1

2. ANS: B   PTS: 1

3. ANS: B   PTS: 1

4. ANS: A   PTS: 1
Lesson 47 ...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Is the following map legal?

<table>
<thead>
<tr>
<th>Key</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>19</td>
<td>-11</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>19</td>
<td>4</td>
</tr>
<tr>
<td>27</td>
<td>7</td>
</tr>
</tbody>
</table>

A. Yes  
B. No

2. Is the following map legal?

<table>
<thead>
<tr>
<th>Key</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Question1”</td>
<td>“yes”</td>
</tr>
<tr>
<td>“Question2”</td>
<td>“no”</td>
</tr>
<tr>
<td>“Question3”</td>
<td>“no”</td>
</tr>
<tr>
<td>“Question4”</td>
<td>“maybe”</td>
</tr>
<tr>
<td>“Question5”</td>
<td>“always”</td>
</tr>
</tbody>
</table>

A. Yes  
B. No

3. What are two ways to instantiate Map mp?

A. Map mp = new HashMap();  
   Map mp = new TreeMap();  
B. Map mp = HashMap();  
   Map mp = TreeMap();  
C. Map mp = new MapHash();  
   Map mp = new MapTree();  
D. Map mp = MapHash();  
   Map mp = MapTree();  
E. None of these

4. Given Map mp, show how to create an Iterator object of the key objects stored in mp.

A. Iterator itr = new Iterator(ks);  
B. Set ks = mp.keySet();  
   Iterator itr = ks.iterator();  
C. Set ks = mp.keySet();  
   Iterator itr = ks.iterator();  
D. Set ks = keySet( );  
   Iterator itr = ks.iterator( );  
E. None of these
MULTIPLE CHOICE

1. ANS: B  PTS: 1
2. ANS: A  PTS: 1
3. ANS: A  PTS: 1
4. ANS: C  PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Which code fragment implements the following flow chart?

A. int n = 4284, d = 1;
   while(d <= n/2);
   {
      if(n%d = = 0)
      {
         System.out.print(d + " ");
      }
      d++;
   }
   System.out.println(n);
   System.out.println("Finished");

B. int n = 4284, d = 1;
   do
   {
      if(n%d = = 0)
      {
         System.out.print(d + " ");
      }
   }while(d <= n/2);
   System.out.println(n);
   System.out.println("Finished");

C. int n = 4284, d = 1;
   do
   {
      if(n%d <= 0)
      {d++;
      {
         System.out.print(d + " ");
      }while(d <= n/2);
   System.out.println(n);
   System.out.println("Finished");

D. int n = 4284, d = 1;
   if(n%d = = 0)
   {do
   {
         System.out.print(d + " ");
   }


```java
} 
    d++; 
} while(d <= n/2);
System.out.println(n); 
System.out.println("Finished");
```
Lesson 48...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B      PTS: 1
Lesson 49 Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Suppose the nodes of a singly linked list store a String as the primary data. What other state variable must each node have?
   A. A reference to the last node in the chain
   B. A reference to the next node in the chain
   C. A reference to the first node in the chain
   D. All of these
   E. None of these

2. What is the value of the nextNode instance field for the tail node (last node) in a singly linked list?
   A. null
   B. 0
   C. nextNode
   D. previousNode
   E. None of these

3. Except for the headNode and tailNode, the other nodes in a singly linked list do not have uniquely named references. How could we address and thus retrieve information from any one of the interior nodes?
   A. It’s not possible.
   B. Use an iterator.
   C. The objects are automatically stored in a queue, so use methods of the Queue class.
   D. Begin at the headNode position (which is named) and traverse the chain of nodes using the nextNode field to get to the next node, until we finally arrive at the desired node.
   E. None of these

4. What is the first node typically called in a singly linked list?
   A. headNode
   B. nextNode
   C. tailNode
   D. previousNode
   E. None of these

5. What interface in Java provides the methods for a singly linked list?
   A. Single
   B. SinglyLinkedList
   C. List
   D. LinkedList
   E. It doesn’t exist
Lesson 49 ... Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B  PTS:  1
2. ANS: A  PTS:  1
3. ANS: D  PTS:  1
4. ANS: A  PTS:  1
5. ANS: E  PTS:  1
Lesson 50 ...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. Besides the primary data, what fields are required for each node designed to fit in a doubly linked list?

   A. A reference to the tail node and the head node
   B. A reference to the tail node and the next node
   C. A reference to the next node and the previous node
   D. A reference to the head node and the next node
   E. A reference to the head node and the previous node

___ 2. What standard Java class is organized as a doubly linked list?

   A. List
   B. LinkedList
   C. ListIterator
   D. Vector
   E. None of these

___ 3. If you had to choose only two methods that are the **most** important to a stack class, what would they be?

   A. pop and push
   B. push and delete
   C. peek and clear
   D. size and peek
   E. None of these

___ 4. What does an initially empty stack (named stck) look like after the following sequence of methods?

```
stck.push(57);
stck.push(22);
stck.peek();
stck.pop();
stck.push(127);
```

   A. 57
      22
      127
   B. 127
      22
      57
   C. 57
      127
   D. 127
      57
   E. None of these
Lesson 50 ... Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: C  PTS: 1
2. ANS: B  PTS: 1
3. ANS: A  PTS: 1
4. ANS: D  PTS: 1
Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. What is a fundamental requirement of an array before a binary search can be performed on it?
   - A. It must be ordered
   - B. It must not be ordered
   - C. Then must be an even number of elements
   - D. There must be an odd number of elements
   - E. None of these

2. What is the average case Big O value for a binary search?
   - A. O(n)
   - B. O(n²)
   - C. O(log n)
   - D. O(nlog n)
   - E. None of these

3. When the `Arrays.binarySearch` method fails to find that for which it is searching, what information is returned?
   - A. `Integer.MAX_VALUE`
   - B. `Integer.MIN_VALUE`
   - C. A very large positive number in scientific notation
   - D. A negative number that, when decoded, yields the index before which the searched-for value would be inserted.
   - E. None of these

4. If you have a large unsorted array of 100,000 `doubles` that you only wish to search one time for a particular value, which would be the most time-efficient way to search it, using a linear search or a binary search?
   - A. Linear search
   - B. Binary search
MULTIPLE CHOICE

1. ANS: A PTS: 1
2. ANS: C PTS: 1
3. ANS: D PTS: 1
4. ANS: A
   A linear search would be most efficient since a binary search would first require ordering the array. This
   would be time consuming.

PTS: 1
Lesson 52 Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. Which of these insertion sequences would produce the following binary search tree?

A. \{25, 50, 52, 56\}  
B. \{50, 25, 52, 56\}  
C. \{50, 25, 56, 52\}  
D. \{50, 52, 25, 56\}  
E. None of these

___ 2. For a binary search tree that stores a single String at each node, what thing(s) must each node object contain as state variables?

A. The actual data  
B. A reference to left-hand child node  
C. A reference to the right-hand child node  
D. All of the above  
E. None of these

___ 3. If a node object has no children, what is stored in the two data members that are references to the left-hand and right-hand child nodes?

A. Empty String  
B. 0  
C. References to the root node  
D. References to the parent node  
E. None of these

___ 4. What is the average case Big O value for a reasonably balanced tree?

A. O(n)  
B. O(n^2)  
C. O(log n)  
D. O(n log n)  
E. None of these

___ 5. What disadvantages are there in using a binary search on an array as compared to using a binary search tree?

A. With an ordered array it would be necessary to reorder after each new insertion.  
B. An array that contains the data has to be pre-dimensioned. This runs the risk of dimensioning too small and running out of space. On the other hand, if we dimension too large, it is wasteful of memory.  
C. Both A and B  
D. None of these
Lesson 52 ... Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: C PTS: 1
2. ANS: D PTS: 1
3. ANS: E PTS: 1
4. ANS: C PTS: 1
5. ANS: C PTS: 1
Lesson 53 ... Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. Is a queue a FIFO or a LIFO?
   A. FIFO
   B. LIFO
   C. Neither

___ 2. What are the two most important methods of a queue class?
   A. size, clear
   B. enqueue, dequeue
   C. enqueue, clear
   D. dequeue, size
   E. None of these

___ 3. What is the Big O value for the enqueue and dequeue methods of a LinkedList based queue?
   A. O(1)
   B. O(n)
   C. O(n^2)
   D. O(log n)
   E. O(n log n)

___ 4. Suppose Queue q initially looks like the following where “One” is at the front of the queue:

   {“One”, “Two”, “Three”}

What will Queue q look like after the following code is executed?

   q.enqueue(Eleven”);
   String s = q.dequeue( );
   q.enqueue(s);

   A. {“Two”, “Three”, “One”, “Eleven”}
   B. {“Three”, “Two”, “Eleven”, “One”}
   C. {“Two”, “Three”, “Eleven”, “One”}
   D. {“Two”, “Eleven”, “Three”, “One”}
   E. None of these
Lesson 53 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: A  PTS: 1
2. ANS: B  PTS: 1
3. ANS: A  PTS: 1
4. ANS: C  PTS: 1
Lesson 54 ...Quiz

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

____ 1. What are two ways to position an inner class?

   A. Inside a method  
   B. Inside another class but not inside a method  
   C. Inside an *if* statement  
   D. Both A and B  
   E. Both B and C

____ 2. If an inner class is placed inside a method, can its methods and variables be accessed from outside the method?

   A. Yes  
   B. No  
   C. Sometimes

____ 3. If an inner class is not inside a method, are the methods and variables of the outer class available to the inner class?

   A. Yes  
   B. No  
   C. Sometimes
Lesson 54...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: D PTS: 1
2. ANS: B PTS: 1
3. ANS: A PTS: 1
Lesson 55 ...Quiz

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

1. In a min heap, what is the relationship of a parent node to its two child nodes?
   - A. There is no relationship
   - B. The parent node is always equal to both of the child nodes.
   - C. The parent node is always greater than either of the child nodes.
   - D. The parent node is always less than either of the child nodes.

2. What is the relationship between a parent node’s two child nodes in a min heap?
   - A. There is no relationship
   - B. The left node is less than the right node
   - C. The left node is greater than the right node
   - D. The two nodes are equal

3. What is a complete tree?
   - A. A tree in which any missing leaf nodes are confined to the bottom level and on the far right
   - B. A tree in which any missing leaf nodes are confined to the bottom level and on the far left
   - C. A tree that has the maximum number of nodes allowed for its height
   - D. None of these

4. Does the following properly describe a reheap-up process in a min heap?
   - A node is placed as the root node and then swapped with one of its children if they are out of order. If a swap is made, then the new parent node is compared with its new parent and swapped if necessary. This is continued until the original leaf node falls into its proper position.
   - A. Yes
   - B. No
Lesson 55 .. Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: D  
   PTS: 1
2. ANS: A  
   PTS: 1
3. ANS: A  
   PTS: 1
4. ANS: B  
   The proper process is:
   A node is placed as a leaf node and then swapped with its parent if they are out of order. If a swap is made, then the new parent node is compared with its new parent and swapped if necessary. This is continued until the original leaf node falls into its proper position.

   PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. How does an ordinary queue differ from a priority queue?
   A. There is no difference.
   B. Priority queue is really a misnomer. It really acts like a stack.
   C. An ordinary queue operates strictly as a LIFO. In a priority queue, objects with the lowest priority go to the front of the queue.
   D. An ordinary queue operates strictly as a FIFO. In a priority queue, objects with the highest priority go to the front of the queue.
   E. None of these

2. What is the data structure of choice for a priority queue?
   A. Binary Search Tree
   B. Heap
   C. LinkedList
   D. ArrayList
   E. None of these

3. In a priority queue, is the first item enqueued always the first to be dequeued?
   A. Yes
   B. No
### MULTIPLE CHOICE

1. ANS: D  
   PTS: 1
2. ANS: B  
   PTS: 1
3. ANS: B  
   PTS: 1
Lesson 57 ...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

_____ 1. In a lookup table, is it possible for the keys to be one and the same as the indices?
   A. Yes  B. No

_____ 2. Which is simpler to use, a hash or a lookup table?
   A. Hash table  B. Lookup table

_____ 3. What are the two main categories for how to deal with collisions?
   A. chaining and searching  D. jumping and leaping
   B. chaining and probing  E. None of these
   C. looping and delaying

_____ 4. In order to gain maximum performance (speed) from a hash table, is a small or large load factor desirable?
   A. small  B. large

_____ 5. In which is it possible for multiple keys to map to the same index, a lookup or hash table?
   A. lookup table  B. hash table
Lesson 57...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: A  
   PTS: 1

2. ANS: B  
   PTS: 1

3. ANS: B  
   PTS: 1

4. ANS: A  
   PTS: 1

5. ANS: B  
   PTS: 1
for_Loop (Lesson 11) ...Contest Type Problems)

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What is the output of the following code?

```java
int sum=0;
for (int k=0; k<5; k++) {
    sum+=k;
}
System.out.println(sum);
```

A. 0  
B. 10  
C. 15  
D. 5  
E. None of these

2. What is the output of the following code?

```java
double kk = 3;
int j = 0;
for( j = 0; j <= 100; j++) {
    kk = kk + Math.pow(j, 2);
    ++kk;
}
System.out.println(j);
```

A. 66  
B. 100  
C. 101  
D. 99  
E. None of these

3. What is the final value of p?

```java
double p = 0;
for(m=10; m>6; --m) {
    if(m == 7) {
        p = p+m;
    }
    else {
        ++p;
    }
}
```

A. 10  
B. 4  
C. 5  
D. 12  
E. None of these
4. Which of the following will print the set of odd integers starting at 1 and ending at 9?

A. for(int j=0; j<=9; j++)
   { System.out.println(j); }
B. for(int j=1; j<10; j=j+2)
   { System.out.println(j); }
C. for(int j=1; j<=9; j+=2)
   { System.out.println(j); }
D. for(int j=1; j<=9; j+=2)
   { System.out.println(j); }
E. Both B and D

5. What is output?

```java
double x = 0;
for(int b=0; b<101; b++)
{
    x = x + 1;
    b--;
}
System.out.println(x);
```

A. 4950
B. 101
C. 100
D. Nothing, it’s an endless loop
E. None of these

6. What is output?

```java
int p, q=5;
for(p=0; p<5; p++;) //notice the semicolon
    q = q+1;
System.out.println(p + " + " + q);
```

A. 5 6
B. 6 6
C. 5 10
D. 5 5
E. None of these

7. What is output?

```java
int j, k;
int count = 0;
for(j=0; j<4; j++)
{
    for( k = 0; k < 10; k++ )
    {
        count++;
    }
}
System.out.print(count--);
System.out.println(count);
```
A. 98
B. 3939
C. 109
D. 4039
E. None of these
for Loop (Lesson 11) ... Contest Type Problems
Answer Section

MULTIPLE CHOICE

1. ANS: B  PTS: 1
2. ANS: C  PTS: 1
3. ANS: A  PTS: 1
4. ANS: E  PTS: 1
5. ANS: D  PTS: 1
6. ANS: A  PTS: 1
7. ANS: D  PTS: 1
while & do-while Loops (Lesson 12) ... Contest Type Problems

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. Which of the following imitates the action of the for-loop below?

for(int j=0; j<100; j++)
{… some code …}

A. int j =0;
   while(j<100){ j++; …some code…}

B. int j=0;
   while(j<100){…some code… j++;}

C. int j=0;
   do{…some code... j++;} while(j<100);

D. Both B and C
E. Both A and B

___ 2. How many times does this loop iterate?

int z = 19;
while(z < 20)
{
  if(z<100)
    continue;
  z++;
}

A. 0
B. 1
C. 2
D. Infinite number of times
E. Both A and B

___ 3. What is the output if the initial value of k and p are both 0?

do {
  if(k = =1)
  {
    p+=3;
  }
  k++;
  p--;
}while(k<3);
System.out.println(p);
4. How many times does this loop iterate if the value of the `boolean b` is **not** known?

    boolean p = true;
    int sum=0;
    while(p)
    {
        sum+=5;
        if(b || !b)
            break;
    }

A. None  
B. 2  
C. Can’t be determined  
D. Infinite number of times  
E. None of these

5. What type of loop would you use if the condition for staying in the loop needs to be tested **before** the loop iterates?

A. `for`-loop  
B. `while`-loop  
C. `do-while` loop  
D. All of these  
E. Both A and B
while & do-while Loops (Lesson 12) ... Contest Type Problems
Answer Section

MULTIPLE CHOICE

1. ANS: D
   It is suggested that D might also be accepted as an answer
   PTS: 1

2. ANS: D  PTS: 1

3. ANS: A  PTS: 1

4. ANS: E
   It goes through the loop just one time.
   PTS: 1

5. ANS: E  PTS: 1
Classes and Objects (Lesson 16)...Contest Type Problems

Multiple Choice
Identify the choice that best completes the statement or answers the question.

```java
public class Student {
    public Student(String nm) {
        <#1>
    }

    public String getName() {
        return name;
    }

    public void setGrade(int grd) {
        numGrades++;
        sum = sum + grd;
    }

    public double getAverage() {
        return sum/numGrades;
    }

    private String name;
    private double sum=0;
    public int numGrades=0;
}
```

1. What should replace `<#1>` in order that the instance field, `name`, be initialized when a new object is created? (Use the code above.)
   A. String name = nm;        D. Can’t be done because name is private
   B. name = nm;                E. None of these
   C. nm name;                  

2. Assuming `<#1>` if filled in correctly, how would you create a `Student` object called `stu1` and set `name` to “Sally”? (Use the code above.)
   A. Student stu1 = new Student( );        D. Student stu1 = new Student(“Sally”);
   B. stu1.name = “Sally”;                  E. None of these
   C. stu1 = new Student(“Sally”);

3. Assume a `Student` object called `myStd` has been created and grades have been assigned. How would you retrieve this student’s average and store the result in the integer variable `sa`? (Use the code above.)
A.  $sa = \text{myStd.getAverage( )};$
B.  $sa = (\text{int})(\text{myStd.sum/numGrades});$
C.  $sa = (\text{int})\text{myStd.getAverage( )};$
D.  Both B and C
E.  None of these

4. Which of the following would print the name of the student represented by the object called $sObj$? (Use the code above.)

A.  `System.out.println( sObj.getName( ) );`

B.  `System.out.println( sObj.name( ) );`

C.  Both A and B

D.  `System.out.println( sObj(name) );`

E.  None of these

5. Which state variable is accessible from outside the Student class? (Use the code above.)

A.  $numGrades$

B.  $name$

C.  $sum$

D.  Both $name$ and $sum$

E.  All are accessible
Classes and Objects (Lesson 16)...Contest Type Problems
Answer Section

MULTIPLE CHOICE

1. ANS: B  PTS: 1
2. ANS: D  PTS: 1
3. ANS: C  PTS: 1
4. ANS: A  PTS: 1
5. ANS: A  PTS: 1
Advanced String Methods (Lesson 17) ... Contest Type Problems

Multiple Choice
Identify the choice that best completes the statement or answers the question.

public class MyTester{
    public static int doStuff(String myString){
        int cc = 0;
        int p = myString.length() / 2;
        for (int k=0; k<myString.length() / 2; k++, p++)
            if(myString.charAt(k) == myString.charAt(p))
                cc++;
        return cc;
    }
}

1. What is returned by `doStuff("I would if I could")`? (Use the code above.)
   A. 1
   B. 2
   C. 3
   D. 4
   E. None of these

2. What is returned by `doStuff("fee fi fo fum")`? (Use the code above)
   A. 1
   B. 2
   C. 3
   D. 4
   E. None of these

public class MyTester{
    public static void convert(String myString){
        String tot = "";
        for(int j=0; j<myString.length(); j++)
            {char ch =
                Character.toUpperCase(myString.charAt(j));
                tot = tot + ch;
            }
        System.out.println(tot);
    }
}

3. What is output with the method call, `convert("Abe Lincoln")`? (Use the code above.)
   A. ABELINCOLN
   B. ABE LINCOLN
   C. aBE LINCOLN
   D. abe lincoln
   E. None of these

4. What is output with the method call, `convert("BR549")`? (Use code above.)
   A. Throws an exception
   B. BR549
5. What is output with the method call, `bailOnM("mumify")`?

A. 0  D. 6  
B. 1  E. None of these  
C. 2

6. What is output?

A. A blank  D. Won’t compile  
B. t  E. None of these  
C. e

7. What is output with the method call, `printStuff("A1 USDA prime.")`?

A. AUSDAprime  D. A USDA PRIME  
B. A USDA prime.  E. None of these  
C. 1

8. What is output with the method call, `elim("ABC1234DEF")`?

<table>
<thead>
<tr>
<th>Option</th>
<th>Actual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 0</td>
<td>6</td>
</tr>
<tr>
<td>B. 1</td>
<td>None of these</td>
</tr>
<tr>
<td>C. 2</td>
<td></td>
</tr>
</tbody>
</table>

B. Nothing  
C. BR549
int sum = 0;
for(int j=0; j<theString.length(); j++) {
    if(theString.charAt(j) > '1' &&
        theString.charAt(j) < '8')
        sum = sum + theString.charAt(j) * 2;
}
return sum;

9. What is output by `System.out.println("Alf Abrams".indexOf('A'))`?
   A. 0  D. 65
   B. 1  E. None of these
   C. 4

10. What is output by `System.out.println("Alf Abrams".lastIndexOf('A'))`?
    A. 0  D. 65
    B. 1  E. None of these
    C. 4

11. What is output with the method call, `doStuff("3872345619")`?
    A. 42345>>>1  D. 4345619>>>1
    B. 43456>>>1   E. None of these
    C. 42345>>>1
Advanced String Methods(Lesson 17) ...Contest Type Problems
Answer Section

MULTIPLE CHOICE

1. ANS: A  PTS: 1
2. ANS: B  PTS: 1
3. ANS: B  PTS: 1
4. ANS: C  PTS: 1
5. ANS: C  PTS: 1
6. ANS: E  PTS: 1
7. ANS: A  PTS: 1
8. ANS: D  PTS: 1
9. ANS: A  PTS: 1
10. ANS: C  PTS: 1
11. ANS: B  PTS: 1
Arrays (Lesson 19) ...Contest Type Problems

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. What is the value of `gem[1]`?

   int [] gem = {-102, 14, 5, 100, -100};

   A. -102     D. 100
   B. 14       E. -100
   C. 5

___ 2. Which code will sort the `gem` array?

   int [] gem = {-102, 14, 5, 100, -100};

   A. mergeSort(gem);     D. Collections.sort(gem);
   B. Arrays.sort(gem[]);  E. Both C and D
   C. Arrays.sort(gem);

___ 3. What is the value of `g` after the call to `nerdStuff`?

   int [] stk = {1, 5, 19, 2, 20, 180};
   int g = nerdStuff(stk) + 1;

   public static int nerdStuff(int [] cb)
   {
       int counter = 0;
       for(int k=0; k<cb.length; ++k)
           if( cb[k] < 3 )
               ++counter;
       return counter;
   }

   A. 3     D. 7
   B. 2     E. None of these
   C. 0

___ 4. Which of the following lines of code is a proper way to declare and initialize the `c` array?

   A. int [] c = new int[] {1, 2, 3, 4};
   B. int [10] c = {1, 2, 3, 4};
   C. int c = {1, 2, 3, 4};

   public static void testLoop(int [] a)
   {
       for(int j=0; <*1>; ++j)
           ++a[j];
   }
5. What should replace `<*1>` in the code above in order that the for-loop variable, \( j \), would cycle through all indices of the \( a \) array?

A. \( j < a.length - 1 \)
B. \( j < a.length( ) \)
C. \( j <= a.length \)
D. \( j < a.length + 1 \)
E. None of these

6. If `<*1>` has been filled in correctly in the code above, and \( a[3] = 19 \) before calling testLoop, what is \( a[3] \) afterwards?

A. 3
B. 19
C. 18
D. 20
E. None of these

7. What is output of the following code?

```java
public class ArrayTest
{
    public static void main(String [] args)
    {
        String s1 = "abcdefghijk";
        char [] x = s1.toCharArray( );
        String s2 = "mnopqrstuvw";
        char [] y = s2.toCharArray( );
        int vv[] = {0,1,0,1};
        for(int j=0; j<vv.length; j++)  {
            switch (vv[j])
            {
                case 0:
                    System.out.print(x[j]);
                    break;
                case 1:
                    System.out.print(y[j+1]);
            }
        }
    }
}
```

A. ancp
B. mbod
C. aocq
D. abcd
E. None of these

8. What is output of the following code?

```java
public class ArrayTest
{
    public static void main(String [] args)
    {
        int a[] = {0,1,2,3};
        int b[] = a;
        int sum = 0;
```
for(int j=0; j<3; j++)  {
    sum+=(a[j+1] * b[j]) + (a[j] * b[j+1]);
}
System.out.println(sum);
}

9. What is output of the following code?

```java
public class ArrayTest {
    public static void main(String [] args) {
        int [] z1 = {2,3,4,5,6};
        int [] z2 = {1,2,1,2,1};
        double d = 0;
        for(int j=0; j<3; j++)
        {
            d = d + Math.pow(z1[j+1], 2)  +  Math.pow(z2[j], 2);
        }
        System.out.println(d);
    }
}
```

A. 102  D. Throws an exception
B. 44  E. None of these
C. 56

10. What is output of the following code?

```java
public class MyTester {
    public static void main(String args[]) {
        int j, src =2, des=3, hm=2;
        int [] sa = {100,200,300,400,500};
        int [] da = {40,50,60,70,80};
        System.arraycopy(sa,src,da,des,hm);
        for(j=0; j<da.length; j++)
        {
            System.out.print(da[j]);
        }
    }
}
```

A. 1002003007080  D. 405060300400
B. 1002007080500  E. None of these
C. 405030040080
11. What is output of the following code?
   A. 6  
   B. 1  
   C. 0  
   D. 2  
   E. Throws an exception

12. What replaces `<#1>` so that the product of all the elements in array `d` is returned?

   ```java
   public static double getProduct()
   {
       double d[] = {100, -25, 16, 27, -102};
       double product = 1;
       <#1>
       return product;
   }
   ```

   A. for(double j: d)   product *= d[j];  
   B. for(int j = 0; j < d.length; j++)  
       product = product * j;  
   C. for(int j = 0; j < d.length; j++)  
       product *= d[j];  
   D. for(double j: d)   product *= j;  
   E. More than one of these
Arrays (Lesson 19) ...Contest Type Problems
Answer Section

MULTIPLE CHOICE

1. ANS: B   PTS: 1
2. ANS: C   PTS: 1
3. ANS: A   PTS: 1
4. ANS: A   PTS: 1
5. ANS: E
   Real answer is j < a.length
   PTS: 1
6. ANS: D   PTS: 1
7. ANS: C   PTS: 1
8. ANS: C   PTS: 1
9. ANS: C   PTS: 1
10. ANS: D  PTS: 1
11. ANS: B  PTS: 1
12. ANS: E
   Both C and D
   PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

```java
public class GpsTrack {
    public GpsTrack(int id) {
        vehicleCount++;  
        vehicleId = id;  
    }
    public static double getLonPos() {
        //Code not shown
    }
    public static double getLatPos() {
        //Code not shown
    }
    public double diffCor() {
        ...
        <#1>
        ...
    }
    //Other methods not shown
    public static double longitude;
    public static double latitude;
    public int vehicleID;
    public String quad = "";
    public static int vehicleCount = 0;
}
```

1. Which of the following is **not** a legal way to access `vehicleCount` in the code above? (Assume that `gpsZ` is a `GpsTrack` object.)
   - A. `double d = gpsZ.vehicleCount;`
   - B. `vehicleCount = 27;`
   - C. `gpsZ.vehicleCount = 27;`
   - D. `int i = GpsTrack.vehicleCount;`
   - E. All are legal

2. Which of the following is **not** a class variable? (Use the code above.)
   - A. `longitude`
   - B. `latitude`
   - C. `vehicleCount`
   - D. `vehicleCount`
   - E. They are all class variables
3. If no objects have yet been instantiated, what is the value of `GpsTrack.vehicleCount` after the following code executes? (Refer to the code above.)

   ```java
   GpsTrack gpsA = new GpsTrack(1);
   GpsTrack gpsB = new GpsTrack(3);
   ```

   A. 0  
   B. 1  
   C. 2  
   D. 3  
   E. None of these

4. Which of the following replacements for `<#1>` are legal? (Use the code above.)

   A. `String s = quad;`  
   B. `int vc = vehicleCount;`  
   C. `int id = vehicleID;`  
   D. `More than one of these`  
   E. `They are all illegal`

5. Is it possible for a constant to also be `static`?

   A. Yes  
   B. No  
   C. Yes, but only if the entire class is `static`
   D. Yes, but only if it’s a numeric  
   E. No, unless it’s leap year

6. The statement `double d = Math.sqrt(pow(3.1, 4.67))` is which of the following?

   A. Evidence that `Math` is a `static` class  
   B. Evidence that `sqrt` is a `static` method  
   C. Evidence that a `static` import was done so that `pow (3.1, 4.67)` is legal  
   D. Only A and C  
   E. Only B and C
MULTIPLE CHOICE

1. ANS: B   PTS: 1
2. ANS: C   PTS: 1
3. ANS: C   PTS: 1
4. ANS: D   PTS: 1
5. ANS: A   PTS: 1
6. ANS: E   PTS: 1
Wrapper Class Objects (Lesson 22) ...Contest Type Problems

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___  1. What is the output?
   public class MyTester
   {
   public static void main(String args[])
   {
      int j=2, k=3;
      Integer bj, bk;
      while(k>0) {
       j = j*k;
       k = k/2;
      }
      bj = j;
      bk = k;
      System.out.println(bj.intValue() + bk);
   }
   }
   A. 0 D. 2
   B. 6 E. None of these
   C. 1

___  2. What is printed when we make the call getAsum("22222")?
   public static void getAsum(String a)
   {
      int total=0;
      Integer p1, p2;
      for(int j = a.length() - 1; j > 1;j--)
      {
         p1 = j-1;
         p2 = new Integer(j);
         total+=j;
      }
      System.out.println(total);
   }
   A. 9 D. 2
   B. 7 E. None of these
   C. 5

___  3. What is returned when we make the call theTest(2)?
   public static int theTest(int div)
   {
      Integer trial;
```java
double d = Math.PI/div;
trial = new Integer((int)d);
return trial.intValue();
```
Wrapper Class Objects (Lesson 22) ... Contest Type Problems
Answer Section

MULTIPLE CHOICE

1. ANS: B PTS: 1
2. ANS: A PTS: 1
3. ANS: D PTS: 1
4. ANS: A PTS: 1
StringTokenizer (Lesson 23) ...Contest Type Problems

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. What is output?

```java
import java.util.*;
public class MyTester
{
    public static void main(String args[]){
        int m=3, n=4, p=5;
        String s="5;4+5=9;3";
        StringTokenizer st=new StringTokenizer(s,";");
        while(st.hasMoreTokens( ))
        {
            System.out.print(st.nextToken( ));
        }
    }
}
```

A.  54593  D.  59=93
B.  54+593  E.  None of these
C.  54+5=93

___ 2. What should be passed as a parameter to the `total` method in order for it to return a 17?

```java
public static int total(String str) {
    StringTokenizer t = new StringTokenizer(str);
    int sum = 5;
    while(t.hasMoreTokens( ))
    {
        sum = sum+Integer.parseInt(t.nextToken( ));
    }
    return sum+1;
}
```

A.  “11”  D.  “15 –1 –2 –1”
B.  “3 8 0”  E.  All of these
C.  “7\n2 1\n1”

___ 3. What is output?

```java
import java.util.*;
public class MyTester
{
    public static void main(String args[]){
```
double [] md = {100.3, 100.4, 100.5, 100.6};
int k=0;
String b = "0 1 2";
StringTokenizer st=new StringTokenizer(b);
while(st.hasMoreTokens( ))
{
    String str = new String(st.nextToken( ));
    //System.out.println(str);
    double val = Double.parseDouble(str);
    ++k;
    md[k]+=val;
}
System.out.print(md[1]);

A.  100.4     D.  102.5
B.  101.4     E.  None of these
C.  101.5

4. What is output?

import java.util.*;
public class MyTester  {
    public static void main(String args[]){
        double [] md = {1, 2, 3, 4};
        int j;
        String b = "0 1 2";
        StringTokenizer st=new StringTokenizer(b);
        int k=st.countTokens( );
        for(j=1; j<=k; j++) {
            double f=Double.parseDouble(st.nextToken( ));
            //System.out.println(j + " " + f + " " + md[j]);
            if(j%2==1){
                md[j]*=f;
            }
            else {
                md[j]/=f;
            }
        }
        System.out.println(md[j-1]);
    }
}

A.  6     D.  Throws exception
B.  8     E.  None of these
C.  2
String s = “Four-score and seven years ago”;
StringTokenizer st = new StringTokenizer(s, “ -”);
for(int j=0; j<5; j++)
    System.out.print(st.nextToken( ));

5. What is output? (Use the code above.)
A. Fourscoreandsevenyearsago       D. Fourscore and seven years ago
B. Four-scoreandsevenyears         E. None of these
C. Fourscoreandsevenyears

6. How would the output change if the for-loop was changed to for(int j=1;j<=5;j++)? (Use the code above.)
A. Throws an exception
B. No change
C. “ago” would be appended to the end of the output.
D. Four-score would be omitted
E. None of these
MULTIPLE CHOICE

1. ANS: C       PTS: 1
2. ANS: E       PTS: 1
3. ANS: A       PTS: 1
4. ANS: B       PTS: 1
5. ANS: C       PTS: 1
6. ANS: B       PTS: 1
Bitwise Operators (Lesson 29) ...Contest Type Problems

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Suppose we wish to subtract the bitwise-OR of $m$ and $n$ from the bitwise-AND of $m$ and $n$. To which of the following should we set $z$?

   
   $$
   \text{public static int Herman(int m, int n) }
   \{
   \quad \text{int } z = \quad; \quad \\
   \quad \text{return } z;
   \}
   $$

   
   A. $(m && n) - (m ^ n)$
   B. $(m & n) - (m | n)$
   C. $m - n$

   D. $(m \& \& n) - (m \| n)$
   E. None of these

2. What is output by the following code?

   
   $$
   \text{int p = 9; }
   \text{int q = -1; }
   \text{boolean sim = } (q-- > 5) \& \& (p++ > 22)
   \text{System.out.println(p + " " + sim);} 
   $$

   
   A. 9 true
   B. 10 true
   C. 9 false

   D. 10 false
   E. None of these

3. What is the value of $w$? (Refer to the code above.)

   
   $$
   \text{int xz[] = }\{6, 0, 3, 3, 5, -1, 12, 7, 3, 3\};
   \text{int w = theMethod(xz);} 
   $$

   
   A. Exception is thrown
   B. 5
   C. 6

   D. 0
   E. None of these

4. What is the value of $w$? (Refer to the code above.)

   
   $$
   \text{int xz[] = }\{2, 0, 3, 3, 5, 4, 2, 7, 3, 3\};
   \text{int w = theMethod(xz);} 
   $$

   
   A. 0
   B. 5
   C. 6

   D. 0
   E. None of these
5. What is the value of \( w \)?

\[
\text{int } \text{xz}[] = \{6, 0, 3, 3, 5, -1, 12, 7, 3, 3\}; \\
\text{int } w = \text{theMethod(xz)};
\]

\[
\text{public static int theMethod(int k[] ) }
\]
\[
\quad \{ \\
\quad \quad \text{int } p=0; \\
\quad \quad \text{for(int } j=0; j < \text{k.length}; j++) \\
\quad \quad \quad \text{if (k[j] } >= 0 \text{ && k[j]} < \text{k.length} \text{ && k[k[j]] } = 3) \\
\quad \quad \quad \quad \text{p++;} \\
\quad \quad \text{return p;} \\
\quad \}
\]

A. Exception is thrown  
B. 5  
C. 6  
D. 0  
E. None of these
Bitwise Operators (Lesson 29) ... Contest Type Problems

Answer Section

MULTIPLE CHOICE

1. ANS: B  PTS:  1
2. ANS: D  PTS:  1
3. ANS: A  PTS:  1
4. ANS: C  PTS:  1
5. ANS: C  PTS:  1
Random Numbers (Lesson 30) ...Contest Type Problems

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. Which of the following is a possible output?

```java
Random rd = new Random( );
System.out.println( rd.nextInt(36) );
```

A. 0  
B. 36  
C. 37  
D. Throws an exception  
E. None of these

___ 2. To simulate the result of rolling a normal 6-sided die, what should replace `<*1>`?

```java
public static int dieOutcome( )
{
    Random rdm = new Random( );
    int die = `<*1>`;
    return die;
}
```

A. `rdm.nextDouble(6)`  
B. `rdm.nextInt(7)`  
C. `1 + rdm.nextDouble(7)`  
D. `1 + rdm.nextInt(6)`  
E. `1 + rdm.nextDouble(6)`

___ 3. Which of the following is a possible output of the following code?

```java
java.util.Random rd = new java.util.Random( );
System.out.println( 1+ 5 * rd.nextDouble( ) );
```

A. 0  
B. .9999  
C. 5.0  
D. 6.0  
E. None of these

___ 4. What would be the range of possible values of `db` for the following code?

```java
double db = genRndDbl(4, 1);
```

```java
public static double genRndDbl(int m, int a)
{
    Random r = new Random( );
    double d = a + m * r.nextDouble( );
    return d;
}
```

A. $1 < db < 5$  
B. $0 < db < 5$  
C. $1 < db < 4$  
D. $1 \leq db \leq 5$  
E. $0 \leq db \leq 5$
5. What would be the replacement code for `<*1>` to generate random numbers from the set \{20, 35, 50, 65\}?

\[
\text{Random } ri = \text{new Random();}
\text{int } ri = <*1>*
\]

A. \(20 \times 15 + ri\text{.nextInt}(4);\)  
B. \(20 + 15 \times ri\text{.nextInt}(5);\)  
C. \(15 \times 20 + ri\text{.nextInt}(4);\)

D. \(15 + 20 \times ri\text{.nextInt}(5);\)  
E. None of these

6. When a class has more than one method of the same name, this is called which of the following?

A. overloading  
B. inheritance  
C. overriding  
D. polymorphism  
E. None of these

7. Which of the following “tosses” a `Coin` object named `theCoin`, and produces a `true` when the `toss()` method yields a `HEADS`?

A. `theCoin.toss == HEADS`  
B. `toss == 0`  
C. `theCoin.toss() == Coin.HEADS`  
D. `theCoin.HEADS == HEADS`  
E. Both C and D

8. Assuming that the `Random` class is “perfect” and generates all of the integers with equal probability, what is the probability that `toss()` returns a head?
A. slightly over .5
B. slightly under .5
C. 1
D. exactly .5
E. None of these
Random Numbers (Lesson 30) ...Contest Type Problems

Answer Section

MULTIPLE CHOICE

1. ANS: A        PTS: 1
2. ANS: D        PTS: 1
3. ANS: C        PTS: 1
4. ANS: A        PTS: 1
5. ANS: E
   Real answer is 20 + 15 * ri.nextInt(4).
   PTS: 1
6. ANS: A        PTS: 1
7. ANS: C        PTS: 1
8. ANS: D        PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What is the output?

```java
public class StrBuf {
    public static void main(String args[]) {
        StringBuffer sb = new StringBuffer();
        int t[] = {1,2,8,9,2};
        String s = "Do unto others as you would have...";
        char [] sc = s.toCharArray();
        for(int j=0; j<t.length; j++) {
            if(t[j] == 2)
                sb.append(sc[j]);
        }
        System.out.print(sb.toString());
    }
}
```

A. Du  
B. t (leading space)  
C. on  
D. nothing  
E. None of these

2. What is the output?

```java
public class StrBuf {
    public static void main(String args[]) {
        StringBuffer sb = new StringBuffer("groovy");
        String st = "dude";
        sb.append(st);
        System.out.print(sb.length());
    }
}
```

A. 10  
B. 9  
C. 8  
D. Throws exception  
E. None of these

3. What is the output?

```java
StringBuffer asb = new StringBuffer("abcdef_mnopqrst");
StringBuffer nsb = StrBuf.sbStuff(asb);
System.out.println(nsb);
```

```java
public class StrBuf
```
public static StringBuffer sbStuff(StringBuffer sb)
{
    for(int j=0; j<sb.length(); j++)
        if(sb.charAt(j) >= 'q' -1)
            sb.setCharAt(j, 'x');
    return sb;
}

4. What is returned by the method call lefty("Rubber ducky")?

public static String lefty(String s)
{
    StringBuffer sb = new StringBuffer(s);
    for(int j=0; j<sb.length(); j++)
        if(sb.charAt(j) >= 'q' -1)
            sb.setCharAt(j, sb.charAt(j-2));
    return sb.toString();
}

A. ducky          D. Throws exception
B. bber ducky      E. None of these
C. Rubbeb d ckc

5. What is the output?

StringBuffer sb = new StringBuffer("Pepsi Cola");
sb.insert(2, "Coke");
System.out.println(sb);

A. PeCokepsi Cola          D. Throws exception
B. PepCokesi Cola          E. None of these
C. Pepsi ColaCokeCoke
MULTIPLE CHOICE

1. ANS: C
2. ANS: A
3. ANS: D
4. ANS: D
5. ANS: A
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. If we call `bolTest(x, y)` in the following code, which of the following is equivalent to what it returns? (assume that `x` and `y` are `boolean` types)

   ```java
   public static boolean bolTest(boolean a, boolean b)  {
           boolean temp = !a || b;
           return temp;
       }
   ```

   A. `!(x && y)`
   B. `!(x && !y)`
   C. `!x && y`
   D. `x || !y`
   E. None of these

2. What is output of the following code?

   ```java
   boolean bv = true;
   for(int j=0; j<79; j++)  {
           bv = !bv;
       }
   System.out.println(bv || false);
   ```

   A. Throws an exception
   B. `false`
   C. `true`
   D. `!bv`
   E. None of these

3. The `????` column of this table is represented by which of the following?

<table>
<thead>
<tr>
<th>p</th>
<th>q</th>
<th>!p</th>
<th>!q</th>
<th><code>????</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>false</td>
<td>false</td>
<td>true</td>
<td>true</td>
<td>false</td>
</tr>
<tr>
<td>false</td>
<td>true</td>
<td>true</td>
<td>false</td>
<td>false</td>
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<tr>
<td>true</td>
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</tr>
<tr>
<td>true</td>
<td>true</td>
<td>false</td>
<td>false</td>
<td>false</td>
</tr>
</tbody>
</table>

   A. `p && q`
   B. `p && !q`
   C. `!p & & q`
   D. `p || q`
   E. `p || !q`

4. Which of the following is the equivalent of `!x && ( a || b || !c)`?

   A. `!x&&a  ||  !x&&b  ||  !x&&(!c)`
   B. `x && !c`
   C. `!x || a && !x || b && & !x || !c`

   D. Both A and C
   E. None of these

5. In the following code, which of the following would equivalently replace the line of code marked with a rem?

   ```java
   public class smallClass  {
       public smallClass(boolean sv1)  {
   ```

   A. `bolTest(sv1)`
   B. `bolTest(true)`
   C. `bolTest(sv1 || true)`
   D. `bolTest(sv1 && true)`
   E. None of these
sv = sv1;
}

public boolean decide(boolean b, int j) {
    if (j > 30) {
        return !!(sv || !b); //
    }
    else {
        return false;
    }
}

private boolean sv;

A. return !sv || b
B. return !(sv || b)
C. return !(sv && !b)
D. return !sv && b
E. None of these
Boolean Algebra & DeMorgan's Theorem (Lesson 32) ...Contest Type Problems
Answer Section

MULTIPLE CHOICE

1. ANS: B  
   PTS: 1
2. ANS: B  
   PTS: 1
3. ANS: B  
   PTS: 1
4. ANS: A  
   PTS: 1
5. ANS: D  
   PTS: 1
public class Tire
{
...

public boolean vogue(boolean p, boolean q)
{
    boolean perk;
    perk = !p || q ? p&&q : p||q;
    return perk;
}
...


1. What would be an appropriate way to call vogue from some other class besides Tire? (assume a and b are booleans ... refer to the code above.)

A. String s;
   s = vogue(false, a&&b?a:!b);

B. int i;
   i = vogue(false, a&&b?a:!b);

C. vogue(false, a&&b?a:!b);

D. boolean bb;
   Tire obj = new Tire( );
   bb = obj.vogue(false, a&&b?a:!b);

E. boolean bol;
   Tire obj = new Tire( );
   bol = obj.vogue(3, a&&b?a:!b);

2. What is returned by the method call, vogue(true, false)? (Refer to the code above.)

A. 0
B. false
C. true
D. Nothing
E. None of these

3. Which of the following selection operator statements does the equivalent of this code?

   if(j = = g)
   {
       m = j++;
   }
   else
   {

m = 37;

A. m = (j = = g)?++j:37;  
B. m = if(j = = g)?j++:37;  
C. m = (j = = g)?37:j++;  
D. m = (j = = g)?j:37;  
E. None of these

4. What will be the value of ht after the method call, ht = nerdMethod(false, false)?

```java
public static double nerdMethod(boolean x, boolean y)
{
    double coneHeight;
    coneHeight = !(x&&y) ? 18.3 : 5 * Math.PI;
    return coneHeight;
}
```

A. 15.70796327  
B. 18.3  
C. 3.141592654  
D. `nerdMethod` is static and can’t be called without creating an object  
E. false
Selection Operator (Lesson 33) ...Contest Type Problems
Answer Section

MULTIPLE CHOICE

1. ANS: D  PTS: 1
2. ANS: C  PTS: 1
3. ANS: D  PTS: 1
4. ANS: B  PTS: 1
Passing by Value & by Reference (Lesson 34) ...Contest Type Problems

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

```java
public class Tester {
    public static void main(String args[])
    {
        int [] prf = {13,22,89,15};
        double d = 30.89;
        Circle myCir = new Circle(18);
        myCir.rad = 14;

        fg(prf, d, myCir);

        System.out.println(d);
        System.out.println(prf[2]);
        System.out.println(myCir.rad);
    }

    public static void fg(int [] x, double d, Circle c)
    {
        d++;
        x[2] = 16;
        c.rad = 122;
        System.out.println(d++);

        /*int nn[] = new int[x.length];
        nn[3] = x[0];
        x = nn; */
    }
}
```

1. What is the output of `System.out.println(d);` in `main`? (Use the code above.)
   - A. 30.89
   - B. 31.89
   - C. 29.89
   - D. 0
   - E. None of these

2. What is the output of `System.out.println(prf[2]);` in `main`? (Use the code above.)
   - A. 89
   - B. 16
   - C. 122
   - D. 22
   - E. None of these

3. What is the output of `System.out.println(myCir.rad);` in `main`? (Use the code above.)
   - A. 13
   - B. 14
   - C. 122
   - D. 16
   - E. None of these
4. What is the output of `println` in the `fg` method? (Use the code above.)

A. 0  
B. 32.89  
C. 30.89  
D. 31.89  
E. None of these

5. Remove the block rem symbols from within the `fg` method. What will be the resulting change in the array `prf` in `main`? (Use the code above.)

A. 0 and 3rd index elements exchanged  
B. 1st and 3rd index elements exchanged  
C. No change  
D. All elements in reverse order  
E. None of these

6. What is output by the following code?

```java
int []gem = {2,3,4,5,6};
harvest(gem);
for(int k=0; k<gem.length; k++)
    System.out.print(gem[k] + " ");

public static void harvest(int h[])
{
    int z[] = new int[h.length];
    for(int j=0; j<z.length; j++)
        z[j] = j * 2;

    h[2] = 7;

    for(int k=0; k<h.length; k++)
        System.out.print(h[k] + " ");
    System.out.println("\n");

    h = z;

    for(int k=0; k<h.length; k++)
        System.out.print(h[k] + " ");
    System.out.println("\n");
}
```

A. 2 3 7 5 6  
B. 2 3 4 5 6  
C. 2 3 7 5 6  
D. 2 3 4 5 6  
E. None of these
Passing by Value & by Reference (Lesson 34) ...Contest Type Problems

Answer Section

MULTIPLE CHOICE

1. ANS: A   PTS: 1
2. ANS: B   PTS: 1
3. ANS: C   PTS: 1
4. ANS: D   PTS: 1
5. ANS: C   PTS: 1
6. ANS: A   PTS: 1
Two-Dimensional Arrays (Lesson 35) ...Contest Type Problems

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Which of these answers is the resulting array after running the following code?

   ```java
   int [][] zorro = new int[3] [4];
   for(int row=0; row<zorro.length; row++)
   {
       for(int col=0; col<zorro[row].length; col++)
       {
           zorro[row][col] = col + 1;
       }
   }
   ```

   A. 0 0 0 0  1 1 1 1  2 2 2 2
       1 1 1 1
       2 2 2 2
       3 3 3 3

   B. 0 1 2 3  0 1 2 3
       0 1 2 3
       0 1 2 3

   C. 1 2 3 4  1 2 3 4
       1 2 3 4
       1 2 3 4

   D. 1 1 1 1
       2 2 2 2
       3 3 3 3

   E. None of these

2. Which of the following answers is the resulting array after running `main` in the `Tester` class?

   ```java
   public class Tester
   {
       public static void main(String args[])
       {
           int z[][] = {{5,6,7,8},
                        {1,2,3,4},
                        {0,1,2,3}};
           MatrixManip f = new MatrixManip();
           f.adjust(z);
       }
   }

   public class MatrixManip
   {
       ...public void adjust(int[][] mat)
       {
           for(int p=0; p<mat.length; p++)
           {
               ...
for(int q=0; q<mat[p].length; q++)
    --mat[p][q];
}
...
}

A. 4 5 6 7
    0 1 2 3
    -1 0 1 2

B. 5 6 7 8
    1 2 3 4
    0 1 2 3

C. 6 7 8 9
    2 3 4 5
    1 2 3 4

D. 1 1 1 1
    2 2 2 2
    3 3 3 3

E. None of these

3. What is printed by `System.out.println(intArray.length);`?

   ```java
   int [][] intArray = { {11,2}, {20,30}, {7,9}, {0,1} ;
   ```

   A. 2
   B. 4
   C. 8
   D. 0
   E. None of these

4. What is printed by `System.out.println(intArray[2].length);`?

   ```java
   int [][] intArray = { {11,2}, {20,30}, {7,9}, {0,1} ;
   ```

   A. 2
   B. 4
   C. 8
   D. 0
   E. None of these

5. Initialize the array `d` and call `doStuff` as follows:

   ```java
   int d[][] = {
       {-1,0,1},
       {5,6,7},
       {2,3,4}
   };
   doStuff(d);
   ```

   ```java
   public static void  doStuff (int [][] frst)
   {
       int len = frst.length;
       int sec[][] = new int[len] [];
       for(int j=0; j<len; j++)
           sec[j] = frst[len -j -1];
       frst = sec;
   }
   ```

   Immediately after the call to `doStuff`, what are the contents of `d`?
A.  
-1 5 2  
0 6 3  
1 7 4  

D.  
-1 0 1  
5 6 7  
2 3 4  

B.  
1 0 -1  
7 6 5  
4 3 2  

E.  None of these  

C.  
2 3 4  
5 6 7  
-1 0 1
Two-Dimensional Arrays (Lesson 35) ...Contest Type Problems
Answer Section

MULTIPLE CHOICE

1. ANS: C   PTS: 1
2. ANS: A   PTS: 1
3. ANS: B   PTS: 1
4. ANS: A   PTS: 1
5. ANS: D   PTS: 1
Inheritance (Lesson 36) ...Contest Type Problems

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What replaces <*1> and <*2> in the code above to indicate that objects cannot be instantiated and that the methods are not being defined?
   A. <*1>: abstract  <*2>: abstract
   B. <*1>: abstract  <*2>: final
   C. <*1>: final  <*2>: abstract
   D. <*1>: final  <*2>: final
   E. None of these

2. The interest earned on a loan is the product of 1/12, the principle, the rate, and the months. What replaces <*3> in the code above to correctly compute the interestEarned( ) method?
3. Assume that the class Info is a subclass of AccountDetails and has a constructor which receives a double and a String. Which of the following builds a Loan p object with rate .07, months 4, and principle $450? (Use the code above.)

A. Loan p (.07, 4, new Info(450, “Bob”));
B. Loan p = Loan(.07, 4, new Info(450, “Bob”));
C. Loan p = new Loan(.07, 4, Info(450, “Bob”));
D. Loan p = new Loan(.07, 4, new Info(450, “Bob”));
E. None of these

4. What is output by the following? (Refer to the code above.)

Parent pr = new Parent(7);
System.out.print(pr.work( ));

A. 1
B. 0
C. 3
D. 7
E. None of these

5. What is output by the following? (Refer to the code above.)

Parent pr = new Child(4, 11);
System.out.print(pr.work( ));
6. What replaces `<*1>` in the following code that causes Z to inherit class A?

```java
public class Z `<*1>`
{
    //methods and data not shown
}
```

A. implements A  
B. subclass of A  
C. subclass of class A  
D. extends A  
E. inherits A

7. Which of the following replaces `<*1>` in the code above so that the default constructor builds a Triangle object with base 2 and altitude 5?

```java
public class Triangle  {
    public Triangle( )  
    {
        `<*1>`
    }
}
public Triangle(int bs, int alt)  
{
    base = bs;
    altitude = alt;
}
public double area( )  
{
    return .5 * base * altitude;
}
private int base;
private int altitude;
}
```

A. this(2, 5);  
B. Triangle (2, 5);  
C. super(2, 5);  
D. this(base) = 2;  this(altitude) = 5;  
E. More than one of these
8. Assume that `<*1>` has been filled in correctly. Which of the following returns the area of *EquilateralTri et*? (use the code above.)

A. (EquilateralTri)et.area( )
B. et.super.area( )
C. et.(EquilateralTri)area( )

D. et.area( )
E. None of these

---

9. Given a *Triangle tri* that is initialized to hold a *Triangle* and an *EquilateralTri et* that is initialized to hold a *Triangle*, which of the following expressions evaluates to *true*? (Use the code above.)

A. Triangle instanceof *EquilateralTri*
B. tri instanceof et
C. tri instanceof *EquilateralTri*

D. Triangle instanceof Object
E. None of these

---

10. Suppose *st* is a *Street object*. Which of these is a valid call to method *House.getInfo( )* using *st* as an argument? (Use the code above.)

A. st.getInfo(Town t)
B. House.getInfo( (Town)st )
C. House.getInfo( Town(st) )

D. House.getInfo(Town.st)
E. None of these

---

11. Suppose *st* is a *Street object*. What is the value of this expression? (Use the code above.)

```
st instanceof Town
```

A. 0
B. true
C. 1

D. false
E. None of these

---

12. public class Car
{
    //methods and data not shown
}
public class Chevy extends Car {
    //methods and data not shown
}

public class Lumina extends Chevy {
    //methods and data not shown
}

12. Given the declarations below, which of the following expressions is true? (Use the code above.)

   Car cr = new Car();
   Chevy chv = new Chevy();
   Lumina lm = new Lumina();

   A. cr instanceof Chevy                     D. lm instanceof Car
   B. chv instanceof Lumina                  E. More than one of these
   C. cr instanceof Lumina

13. Suppose that the static method doStuff() of class Engine takes a parameter of type Lumina. Given the declarations below, which of these is a valid call to doStuff()? (Use the code above.)

   Car cr = new Lumina();
   Chevy chv = new Lumina();
   Lumina lm = new Lumina();

   A. Engine.doStuff(chv)                     D. doStuff((Car)lm)
   B. Engine.doStuff(cr)                     E. None of these
   C. Engine.doStuff(lm)

14. Suppose that Insect is an abstract class, that Bee is a class that extends Insect, and that Drone is a class that extends Bee. Given the following declaration, which of these is true?

   Drone d = new Drone();

   A. d instanceof Object                     D. d instanceof Drone
   B. d instanceof Insect                    E. All of these
   C. d instanceof Bee

15. If class Man is a subclass of class Person, what is the syntax for calling a private method of Person named meth() from within a private method of Man?

   A. this.meth()                             D. super(meth())
   B. meth()                                 E. None of these
   C. super.meth()

16. Which of the following replaces <*1> in the code to the right to call the constructor for the Pasta class with the parameter g?

   public class Spaghetti extends Pasta
public Spaghetti(int g, int h) {
    <*1>
    ...
}

A. this(g);
B. super(g);
C. x.super();
D. Pasta(g);
E. None of these
MULTIPLE CHOICE

1. ANS: A  PTS: 1
2. ANS: B  PTS: 1
3. ANS: D  PTS: 1
4. ANS: D  PTS: 1
5. ANS: E  
   Answer is 15  
   PTS: 1
6. ANS: D  PTS: 1
7. ANS: A  PTS: 1
8. ANS: D  PTS: 1
9. ANS: E  PTS: 1
10. ANS: B  PTS: 1
11. ANS: B  PTS: 1
12. ANS: D  PTS: 1
13. ANS: C  PTS: 1
14. ANS: E  PTS: 1
15. ANS: E  It can’t be done because it’s private.  
   PTS: 1
16. ANS: B  PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

//Assume nextLine( ) and nextInt( ) are static methods in //a class named Scanner that reads a String and an integer //from the keyboard.

Scanner rdr = new Scanner(System.in);
String str = rdr.nextLine( );
int j = rdr.nextInt( );

try  
{  
    System.out.print( str.charAt(j) );
}

catch(StringIndexOutOfBoundsException e)  
{  
    System.out.print(“Error: ” + j);
}

1. What is output by the code above using the input below?
   big mamma
   2
   A. mamma  D. i
   B. big mamma  E. big mamma2
   C. g

2. What is output by the code above using the input below?
   big mamma
   22
   A. b  D. Nothing
   B. Error: 22  E. None of these
   C. a

//Returns the product of two integers represented as //strings. If either string is not a number, returns the other //number. If both are not numbers, returns 1.

public static int product(String str1, String str2) {  
    int prd = 1;
    try {  
        prd*=Integer.parseInt(str1);
    }
    catch(NumberFormatException) {  

try {
    prd* = Integer.parseInt(str2);
} catch (NumberFormatException) {
    // Placeholder
}
return prd;

3. Which of the following replaces <*1*> in the code above to make it do what the remarks suggest?

A. prd = 1;
B. return 1;
C. System.exit( );
D. No code is needed
E. None of these

4. Assume <*1*> has been filled in correctly. What is returned by `product("two", "5")`? (Use the code above.)

A. 10
B. 5
C. 1
D. 2
E. None of these

5. What is output by the code below if the static method called `test()` encounters the following line of code? Assume the `test` signature includes `throws NumberFormatException`.

    int j = Integer.parseInt("Two Thousand");

    try {
        test( );
    }
    catch (NumberFormatException e) {
        System.out.println("Error with number format");
    }
    catch (RuntimeException e) {
        System.out.println("Error");
    }

A. Nothing
B. Error with number format
C. Error with number format
D. Error
E. None of these
6. If the code designated by <*1> below does not throw any exceptions, which of the remaining code sections will execute?

```
try {
    <*1>
}
catch(RunTimeException e) {
    <*2>
}
finally {
    <*3>
}
```

A. <*2>  
B. <*2> and <*3>(if no errors in <*2>)  
C. <*3>  
D. <*2> and <*3>  
E. None of these

7. What exceptions thrown by method mental() are passed up the calling chain?

```
public static void mental() throws IOException {
    // code not shown
}
```

A. All exceptions  
B. IOException  
C. IOException, its subclasses, and unchecked exceptions  
D. IOException and its subclasses  
E. None of these

8. Suppose the main method does not include a try or catch. Futhermore, the code which inputs disk values may throw an IOException. Which of these should replace <*1> in the code below?

```
public static void main(String[] args) <*1> {
    // input some values from disk
}
```

A. throws IOException  
B. throw IOException  
C. throws new IOException  
D. extends IOException  
E. None of these

9. Which of these is not a keyword in Java?

A. short  
B. continue  
C. finally  
D. final  
E. None of these
Exceptions (Lesson 37) ...Contest Type Problems
Answer Section

MULTIPLE CHOICE

1. ANS: C  PTS: 1
2. ANS: B  PTS: 1
3. ANS: D  PTS: 1
4. ANS: B  PTS: 1
5. ANS: C  PTS: 1
6. ANS: C  PTS: 1
7. ANS: C  PTS: 1
8. ANS: A  PTS: 1
9. ANS: E  PTS: 1
Interfaces (Lesson 38) ... Contest Type Problems

Multiple Choice
Identify the choice that best completes the statement or answers the question.

```
public interface Vector
{
    double dotProduct(double b[]);
    double[] crossProduct(double b[]);
    double absoluteValue(double b[]);
}

public class VectorManip <*1>*
{
    public VectorManip(double v[])
    {
        iComp = v[0];
        jComp = v[1];
        kComp = v[2];
    }

    public double dotProduct(double b[])
    {    …code not shown …    }

    public double[] crossProduct(double b[])
    {    …code not shown …    }

    public double absoluteValue(double b[])
    {    …code not shown …    }

    public double[] sum(double b[])
    {    …code not shown …    }

    private double iComp;
    private double jComp;
    private double kComp;
}
```

___ 1. What replaces <*1> so that VectorManip simultaneously implements the Vector interface and inherits the Tensor class? (Use the code above.)

A. implements Vector extends Tensor  D. extends Vector implements Tensor
B. implements Tensor extends Vector  E. None of these
C. extends Tensor implements Vector

___ 2. Assuming <*1> has been filled in correctly, which of the following is of correct syntax and is true if the object vm is created by:

```
VectorManip vm = new VectorManip(b); (Use the code above.)
```
A. `vm instanceof VectorManip`   B. `vm instanceof Vector`   C. `VectorManip instanceof vm`

3. Assuming `<*1>` has been filled in correctly, which of the following is true if `v1` is created by:

```
Vector v1 = new VectorManip(b);  (Use the code above.)
```

A. `v1` can use all the methods in the `VectorManip` class  
B. The syntax is incorrect  
C. `v1` is a `VectorManip` object  
D. `v1` is a `Vector` object  
E. None of these

4. Assuming `<*1>` has been filled in correctly, which of the following is true if the `crossProduct` method is omitted from the `VectorManip` class? (Use the code above.)

A. `VectorManip` won’t compile  
B. Omitting `crossProduct` is completely legal  
C. Omitting `crossProduct` would be completely legal if `VectorManip` did not implement `Vector`  
D. Both A and C  
E. None of these

5. Saying that `Jackson` realizes the `President` interface is the same as saying which of the following?

A. `Jackson` inherits `President`  
B. `Jackson` implements `President`  
C. `President` extends `Jackson`  
D. `President` implements `Jackson`  
E. None of these
Interfaces (Lesson 38) ... Contest Type Problems

Answer Section

MULTIPLE CHOICE

1. ANS: C
   
   `extends` must come first

   PTS: 1

2. ANS: E
   
   A and B both work

   PTS: 1

3. ANS: D   PTS: 1

4. ANS: D   PTS: 1

5. ANS: B   PTS: 1
Big O (Lesson 39) ...Contest Type Problems

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Which of the following would generally indicate the fastest algorithm for large \( n \)?
   
   A. \( O(n^2) \)  
   B. \( O(n \log n) \)  
   C. \( O(n) \)  
   D. \( O(\log n) \)  
   E. Need more info

2. What is the order of the time complexity of calling the method, \( \text{doIt(tam)} \). Assume that \( \text{tam} \) is a double array with \( m \) rows.

   ```java
   public double doIt(double vc[])
   {
     int k = vc[0];
     int sum = 0;
     for(int p=0; p<vc.length; p++)
       for(q=0; q<vc.length; q++, k--)
       {
         sum+= k + vc[q] + p;
       }
     return sum;
   }
   ```

   A. \( O(m) \)  
   B. \( O(m^2) \)  
   C. \( O(\log m) \)  
   D. \( O(\text{sum} + m) \)  
   E. None of these

3. For the algorithm represented in the table below, what would be the corresponding Big O value?

<table>
<thead>
<tr>
<th>Number of times to execute a block of code</th>
<th>Time required to run (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>2</td>
</tr>
<tr>
<td>2000</td>
<td>16</td>
</tr>
<tr>
<td>3000</td>
<td>54</td>
</tr>
</tbody>
</table>

   A. \( O(n) \)  
   B. \( O(n^2) \)  
   C. \( O(n^3) \)  
   D. \( O(\log n) \)  
   E. None of these

4. Which answer most closely represents the time order complexity of the following call to the \( \text{pooch} \) method? (Assume all rows have equal length in the \( \text{gryLion} \) array.)

   ```java
   m = gryLion.length;
   n = gryLion[0].length;
   int apro[] = pooch(gryLion);
   ```

   A. \( O(n) \)  
   B. \( O(n^2) \)  
   C. \( O(n^3) \)  
   D. \( O(\log n) \)  
   E. None of these
public static int[] pooch(int zzTop[][])
{
    int row, col;
    int barb[] = new int[zzTop.length];
    for(k =0; k < zzTop.length; k++)
    {
        for(j=0; j < zzTop[k].length; j++)
        {
            barb[k] += k * k + xxTop[k][j];
        }
    }
    return barb;
}

A.  O(mn)               D.  O(m^2n^2)
B.  O(m^2)               E.  None of these
C.  O(n^2)

5. What is the Big O value for the following code?

    for(j = 0; j < n; j+=2)
        for(k =0; k < d; k = k * 8)
        {
            ...some code...
        }

A.  O( n/2 log d )               D.  O(n log d)
B.  O(log (nd) )               E.  None of these
C.  O(d log n)
MULTIPLE CHOICE

1. ANS: D  PTS: 1
2. ANS: B  PTS: 1
3. ANS: C  PTS: 1
4. ANS: A  PTS: 1
5. ANS: D  PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

public class MergeSort
{
    private static void mSort(Comparable[] S, int first, int last)
    {
        int mid = (first + last) / 2;
        if(mid == first)  return;
        mSort(S, first, mid);
        mSort(S, mid, last);
        merge(S, first, last);
    }

    public static void mSort(Comparable[] S)
    {
        mSort(S, 0, S.length);
    }

    private static void merge(Comparable[] S, int first, int last)
    {
        Comparable tmp[] = new Comparable[last - first];
        int i=first, j=(first+last)/2, k=0;
        int mid=j;

        while(i<mid && j<last)
        {
            if(S[j].compareTo(S[j])<0)
                tmp[k++]=S[j++];
            else
                tmp[k++]=S[j++];
        }

        while(i<mid)   tmp[k++]=S[i++];
        while(j<last)  tmp[k++]=S[j++];

        for(i=0; i<last-first; ++i)
            S[first + i] = tmp[i];
    }
}
2. Suppose the array of `Integer` objects below is sorted with the `mSort()` method. What is the final state of the array after the two recursive calls to `mSort()` complete, but before the final call to `merge()`? (Use the code above.)

```
{11, 20, 1, -3, -2, 0}
```

A. `{11, 20, 1, -3, -2, 0}`  
B. `{1, -3, -2, 0, 11, 20}`  
C. `{3, -3, -2, 0, 1, 11, 20}`  
D. `{1, 11, 20, -3, -2}`  
E. None of these

3. Which of these has the same worst case Big O as the `mSort` method above?

A. Binary search  
B. Sequential search  
C. Insertion Sort  
D. Quick Sort  
E. None of these

4. Which of the following could be a legal parameter for the `mSort` method above to receive as its first parameter?

A. an array of `Strings`  
B. an array of integers  
C. an array of `HashMap`s  
D. an array of `doubles`  
E. All of these

```
public static void aSort(Comparable array[]) {
    int length = array.length;
    for (int j = 1; j < length; ++j) {
        int pos1 = 0, pos2 = j - 1;
        while (pos1 <= pos2) {
            int mid = (pos1 + pos2) / 2;
            if (array[mid].compareTo(array[j]) < 0) {
                pos1 = mid + 1;
            } else {
                pos2 = mid - 1;
            }
        }
        Comparable tmp = array[j];
        for (int k = length - 1; k > pos1; --k) {
            array[k] = array[k - 1];
        }
        array[pos1] = tmp;
    }
}
```

5. What is the purpose of the `aSort` method in the code above?
A. Perform a Selection Sort  D. Perform a Merge Sort  
B. Perform a Binary Search  E. Perform a Quick Sort  
C. Perform an Insertion Sort  

6. If the array below is passed to the aSort method in the code above, what will it look like after the outer for-loop completes its first iteration?

{“dude”, “where’s”, “my”, “car”}

A. {“where’s”, “car”, “my”, “dude”}  D. {“dude”, “where’s”, “my”, “car”}  
B. {“dude”, “my”, “car”, “where’s”}  E. None of these  
C. {“where’s”, “my”, “car”, “dude”}  

7. What is the worst case Big O value for aSort() when it receives an array of length \(n\)? (Refer to the code above.)

A. \(O(\log(n))\)  D. \(O(n)\)  
B. \(O(n^2)\)  E. None of these  
C. \(O(n \log n)\)  

8. To do a binary search of an array of Object type objects, which of the following must be true?

A. The objects must be sorted  
B. The objects must have been of the same original type  
C. The original objects must have all been String types  
D. Both A and B  
E. All of these  

9. The Arrays.sort() static method of the java.util package sorts an array. What is the best case Big O value of this method on an array of randomly ordered double precision numbers?

A. \(O(n^2)\)  D. \(O(\log n)\)  
B. \(O(2^n)\)  E. None of these  
C. \(O(n \log n)\)  

```java
public static void mysterySort(int [] array) {
    int minIndx=0, minVal=0;
    for(int k=0; k<array.length; ++k) {
        minVal = array[k];
        minIndx = k;
        for( int j = k+1; j < array.length; ++j ) {
            if( array[j] < array[minIndx] ) {
                minVal = array[j];
                minIndx = j;
            }
        }
        array[minIndx] = array[k];
        array[k] = minVal;
    }
}
```
10. Which sorting algorithm is implemented by the code above?
   A. Quick Sort  
   B. Selection Sort  
   C. Merge Sort  
   D. Insertion Sort  
   E. None of these

11. Using the code above, time complexity analysis yields what value if array.length equals n? Choose the smallest correct answer.
   A. O(n log n)  
   B. O(n)  
   C. O(n^2)  
   D. O(log n)  
   E. None of these

// Binary Search method
public static boolean bSrch(Comparable [] Array, int start, int end, Comparable thing) {
    if(start>end)
        return false;
    int mid = (start + end) / 2;
    if(Array[mid].equals(thing))
        return true;
    else if(Array[mid].compareTo(thing) < 0)
        return bSrch(Array, mid+1, end, thing);
    else
        return bSrch(Array, start, mid-1, thing);
}

12. How many times is the equals() method above called when executing bSrch(B, 0, 5, “ff”) where B is the array below?

   {“aa”, “bb”, “ee”, “ff”, “yy”, “zz”}

   A. 1  
   B. 3  
   C. 2  
   D. 0  
   E. None of these

13. If you are limited to examining only n elements, what is the largest size array upon which a binary search can be implemented? (Refer to the code above.)

   A. n^2  
   B. 2^n  
   C. 2n  
   D. 2^n-1  
   E. None of these
public static void mysterySort(int ary[]) {
    for(int j=0; j < ary.length; ++j) {
        int min = ary[j], minIndx = j;
        for(int k=j+1; k < ary.length; ++k)
            if(ary[k] < ary[minIndx]) {
                min=ary[k];
                minIndx = k;
            }
        ary[minIndx]= ary[j];
        ary[j] = min;
    }
}

14. What code replaces `<*>1>` in the code above so that `j` will always be less than the number of elements in the `ary` array?
   A. ary.length+1  D. (length)ary
   B. ary.length     E. None of these
   C. ary.length-1

15. Assume that `<*>1>` has been filled in correctly in the code above. Which sorting routine is being implemented?
   A. Selection sort  D. Insertion sort
   B. Quick sort      E. None of these
   C. Merge sort

16. How would you call the sorting routine that’s a part of the `java.util` package, to sort the array `tinyArray`?

   int [] tinyArray;
   tinyArray[0] = 89;
   tinyArray[1] = 511;
   tinyArray[2] = -18;
   tinyArray[3] = 29;
   tinyArray[4] = 67;

   A. Arrays.sort(tinyArray)  D. (Arrays)sort(tinyArray)
   B. mergeSort(tinyArray)    E. None of these
   C. tinyArray.sort( )

   public static void mrgSort(Comparable[] Array, double start, double end) {
    double mid = (start + end) / 2;
    if(mid == start)
    {
        return;
    }
mrgSort(Array, start, mid);
mrgSort(Array, mid, end);
merge(Array, start, end);
}

17. For the mrgSort method above to implement a merge sort on Array, what should the merge() method accomplish?
   A. Do a Selection sort on the combination of the two halves.
   B. Sort the first half of Array
   C. Combine the unsorted list stored in the front half of Array with the unsorted list in the back half of Array.
   D. Combine the sorted list stored in the first half of Array with the sorted list in the second half of Array in such a way that the combination is sorted.
   E. None of these

18. Assume that merge() has been done correctly. What is the worst case Big O value of mergeSort(Array, 0, Array.length), where n equals Array.length? (Refer to the code above.)
   A. O(n^2)
   B. O(log n)
   C. O(n log n)
   D. O(log n)
   E. None of these
Arrays.sort uses a modified merge sort.

1. ANS: B  PTS: 1
2. ANS: D  PTS: 1
3. ANS: E  PTS: 1
4. ANS: A  PTS: 1
5. ANS: C  PTS: 1
6. ANS: D  PTS: 1
7. ANS: B  PTS: 1
8. ANS: D  PTS: 1
9. ANS: C  PTS: 1
10. ANS: B  PTS: 1
11. ANS: C  PTS: 1
12. ANS: B  PTS: 1
13. ANS: D  PTS: 1
14. ANS: B  PTS: 1
15. ANS: A  PTS: 1
16. ANS: A  PTS: 1
17. ANS: D  PTS: 1
18. ANS: C  PTS: 1
Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. What replaces `<*1>` in the code above to throw an appropriate exception when it violates the precondition?

   A. throws RunTimeException;
   B. throw new RunTimeException();
   C. throw new NumberFormatException();
   D. throws NumberFormatException();
   E. throw new NullPointerException();

2. What replaces `<*2>` in the code above to access the individual weight of the player in the `plyrs` list with index `i`?
A.  (Player) plyrs.get(i).weight( )
B.  ((Player)plyrs.get(i)).weight( )
C.  (Player) (plyrs).get(i).weight( )

3. The class PlayerInfo is an implementation of the interface Player, and the PlayerInfo constructor receives no parameters. Which of the following are valid declarations/instantiations? (Refer to the code above.)

A.  Player p = new PlayerInfo( );
B.  PlayerInfo pi = new Player( );
C.  Player p = new Player;

4. What could be the type of kbal to insure that the add method is used correctly?

ArrayList al = new ArrayList( );
al.add(kbal);

A.  int
B.  String
C.  Both A and B

5. What would replace <*>1> in the code below so that the Integer stored at index 3 of the list be stored in the primitive integer j?

ArrayList aList = new ArrayList( );
//add some integers to the list
<*1>

A.  Integer j = (Integer) aList.get(3);
B.  Integer j = aList.get(3);
C.  int j= (Object)aList.get(3).intValue( );

6. Which of the following is an appropriate way to create an ArrayList object to which we could immediately begin adding Cabinet type objects? (Refer to the code above.)

//Assume that the classes PositionName, Officer, Assistant, and Description already exist
public class Cabinet
{
    public Description getDescr( )
    {
        return descr;
    }
    …constructor and other methods not shown…

    //State variables
    private PositionName positionName;
    private Officer indivName;
    private Assistant underlings;
    private Description descr;
}

//Assume that the classes PositionName, Officer, //Assistant, and Description already exist
public class Cabinet
{
    public Description getDescr( )
    {
        return descr;
    }
    …constructor and other methods not shown…

    //State variables
    private PositionName positionName;
    private Officer indivName;
    private Assistant underlings;
    private Description descr;
}
7. If `ArrayList objAL` contains objects of type `Cabinet`, which of the following will cause `Cabinet cab` to be set equal to the object at index 8 of `objAL`? (Refer to the code above.)

A. `cab = (Cabinet)(objAL.get(8));`
B. `cab = (Cabinet)objAL.get(8);`
C. `cab = objAL.get(8);`
D. More than one of the above
E. None of these

8. Suppose `cab1` is an object of type `Cabinet`. Which of the following returns a `Description` object? (Refer to the code above.)

A. `Cabinet.cab1.getDescription();`
B. `cab1.getDescr();`
C. `cab1.descr;`
D. `(Description)cab1.getDescription();`
E. None of these

9. What replaces `<#1>` in the code below so that the value of the `Integer` stored at index 2 of the `lst` object is placed into `int j`?

```java
List<Integer> lst = new ArrayList<Integer>( );
lst.add(57);
lst.add(-102);
lst.add(57);
lst.add(57);
<#1>
```

A. `int j = lst.get(2);`
B. `Object ob = lst.get(2);
   Integer ij = (Integer)ob;
   int j = ij.intValue( );`
C. `int j = (Integer)lst.get(2);`
D. `int j = lst.getValue(2);`
E. More than one of these
MULTIPLE CHOICE

1. ANS: E
   This is the best answer... throws RuntimeException is the next best
      PTS: 1

2. ANS: B      PTS: 1
3. ANS: A      PTS: 1
4. ANS: C      PTS: 1
5. ANS: D      PTS: 1
6. ANS: D      PTS: 1
7. ANS: A      PTS: 1
8. ANS: B      PTS: 1
9. ANS: E
   Both A and B
      PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

import java.util.*;
public class Tester
{
  public static void main(String args[])
  {
    public static void main(String args[])
    {
      List<Double>dblList = new ArrayList<Double>();
      for(double d=5; d>=0; d--)
      {
        dblList.add( d );
      }
      traverseAndPrint(dblList);
    }
  public static void traverseAndPrint(List myList)
  {
    System.out.print( itr.next( ) );
  }
}

1. What replaces <*1*> in the code above to make itr an Iterator type for the myList object?

   A. Iterator itr = iterator(myList);
   B. Iterator itr = myList.iterator( );
   C. Iterator itr = (List) myList.iterator( );
   D. Iterator itr = List.myList.iterator( );
   E. None of these

2. If <*>1*> has been filled in correctly in the code above, what is printed when the main method executes?

   A. 5.04.03.02.01.00.0
   B. 543210
   C. 0.01.02.03.04.05.0
   D. 012345
   E. None of these

public static void doSomething(LinkedList lnkLst)
{
  Iterator itr = lnkLst.iterator( );
  while(itr.hasNext( ))
  {
    System.out.println(<*1*>);
  }
3. What would be the appropriate replacement code for <*1> above that will cause all of the members of the linked list to be printed?

A. `lnkLst.itr.next()`                   D. `Iterator.next(itr)`  
B. `lnLst(itr)`                        E. None of these  
C. `itr.next()`                      

4. Assuming that <*1> has been filled in correctly, what inherited method from the cosmic superclass `Object` is ultimately called inside the `println` method that converts the contents of the returned `Objects` to a printable form? (Refer to the code above.)

A. `hashCode()`                   D. `toString()`  
B. `equals()`                        E. None of these  
C. `clone()`                     

```
List<String>lst = new ArrayList<String>();
String s[] = “Hello to you”.split(“\s”);
for(int j = 0; j < s.length; j++)
{
    lst.add(s[j]);
}
Iterator itr = lst.iterator();
for(itr.next(); itr.hasNext(); itr.next())
{
    <*1>;
}
System.out.println(lst);
```

5. What would be the replacement code for <*1> in the code above in order that items be removed from the list?

A. `itr.remove()`                   D. `itr.remove( lst.next( ) )`  
B. `Iterator.itr.remove()`          E. More than one of these  
C. `lst.remove()`                     

6. What is the output of the code above?

A. `you`                   D. `[you]`  
B. `Hello to you`   E. Nothing is printed  
C. `[ ]`                       

7. What would be the resulting change in the output if `ArrayList` in the code above was replaced with `LinkedList`?

A. No change                   D. Nothing would be printed  
B. List would print in reverse order   E. None of these  
C. Illegal, would not compile
8. What is the running time of the loop in the code above containing `<#1>` if there are $n$ items in the list?

A. $O(1)$  
B. $O(n)$  
C. $O(n^2)$  
D. $O(\log n)$  
E. None of these

```java
ArrayList<Double>myLst = new ArrayList<Double>( );
myList.add(101.24);
//…add more doubles…
Iterator<Double>itr = myLst.iterator( );
while(itr.hasNext( )
{
    <#1>
    System.out.println(d);
}
```

9. What replaces `<#1>` in the code above so that all floating point numbers in `myLst` are printed?

A. `Double d = itr.next( );`  
B. `Double d = (Double)itr.next( );`  
C. `Double d = <Double>itr.next( );`  
D. `Double d = (Double)myLst.next( );`  
E. More than one of these

10. What other type objects could be added to `myLst`? (Refer to the code above.)

A. `Float`  
B. `String`  
C. `Integer`  
D. More than one of these  
E. None of these
MULTIPLE CHOICE

1. ANS: B  
2. ANS: A  
3. ANS: C  
4. ANS: D  
5. ANS: A  
6. ANS: D  
7. ANS: A  
8. ANS: C  
9. ANS: E  
   Both A and B work  
   PTS: 1  
10. ANS: E  
    PTS: 1
Comparable/Comparator (Lesson 45) ... Contest Type Problems

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. Which of these signatures represents the method that must be added to the Car class so that it implements the Comparable interface?

   public class Car <*1>
   {
   //code not shown
   }

   A. public int equals(Object o)
   B. public boolean equals(Object o)
   C. public boolean compareTo(Object o)
   D. public int Comparable(Object o)
   E. None of these

___ 2. What replaces <*1> in the code below so that the methods of the Car class are forced to include those of the Comparable interface?

   public class Car <*1>
   {
   //code not shown
   }

   A. (Comparable)
   B. implements Comparable
   C. extends Comparable
   D. is Comparable
   E. None of these

//Binary Search
//Return true if Object lookFor is found in the obj //array(ascending order)...otherwise false.
public static boolean bSrch(Comparable[] obj, Object lookFor)
{
   int start=0, end=obj.length-1;
   int mid;
   do
   {
      mid=(start + end) / 2;
      int comp = obj[mid].compareTo(lookFor);
      if(<*1>)
         return true;
      else if(<*2>)
         start = mid + 1;
      else
         end = mid - 1;
   }while(start <= end);
   return false;
}

___ 3. What replaces <*1> in the code above to determine if obj[mid] is the same as the object being searched for?

   A. comp = = 0
   B. comp == 0
   C. comp = 0
   D. comp > 0
   E. None of these
4. What is replacement code for `<2>` in the code above to determine if `obj[mid]` is smaller than `lookFor`?

A. `!comp`  
B. `comp > 0`  
C. `comp == -1`  
D. `comp == 0`  
E. None of these

5. Which of the following is possible as the return value of `s1.compareTo(s2)` if `s1` is a lower case `String`, `s2` is an upper case `String`, and with `s1` coming before `s2` in the dictionary?

A. 2  
B. 0  
C. -1  
D. `<`  
E. None of these

6. Which of the following is not a subclass of `Object`?

A. `String`  
B. `Comparable`  
C. Both A and B  
D. `Integer`  
E. None of these
MULTIPLE CHOICE

1. ANS: E
   Answer is `public int compareTo(Object o)`
   PTS: 1
2. ANS: B  PTS: 1
3. ANS: A  PTS: 1
4. ANS: E
   answer is `comp < 0`
   PTS: 1
5. ANS: A  PTS: 1
6. ANS: C
   ...because `Comparable` is not a class. It’s an interface. Also, `int` is not a class.
   PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

//This method is in the class that implements Set
public int compareTo(Object obj)
{
    … Code that returns a 0 if the sets are identical,
    … returns –1 if they are not identical.
}

//This method is in some other class
public static boolean subset(Set s1, Set s2)
{
    Iterator itr = s1.iterator();
    while( itr.hasNext( ) )
    {
        if (<*1> )
            return false;
    }
    return true;
}

1. Which of the following replaces <*1> in the code above so as to determine whether Set s1 is a subset of Set s2?
   A. !s2.contains(itr.next( ))
   B. s2[itr.next( )] = = false
   C. s2.contains(itr.next( ))
   D. s2.add( itr.next( ) )
   E. None of these

2. Assume <*1> has been filled in correctly. Which of the following checks whether Set s1 and Set s2 contain the same elements? (Refer to the code above.)
   A. subset(s1, s2) && subset(s2, s1)
   B. (s1.compareTo(s2) = = 0)
   C. Both A and B
   D. subset(s1,s2) || subset(s2,s1)
   E. None of these

public static int total(List theList)
{
    Set st = <*1>;
    Iterator iter = theList.iterator();
    while( iter.hasNext( ) )
    {
        st.add( iter.next( ) );
    }
    st.add(new Integer(3));
    st.add(new Integer(18));
```java
int tot = st.size();
return tot;
}

3. What replaces `<*1>` in the code above so that an object implementing the Set interface is created?
   A. new HashSet()
   B. new TreeSet()
   C. new BinaryTreeSet()
   D. new SetTree()
   E. More than one of these

4. Assume that `<*1>` has been filled in correctly. If List lst contains the wrapper class equivalents of the elements below, what is returned by the static method call total(lst)? (Refer to the code above.)
   {18, 97, 5, 3, 22}
   A. 8
   B. 7
   C. 6
   D. 5
   E. None of these

5. Which Object class method is called when the HashSet add() method is called?
   A. compareTo()
   B. new hashCode()
   C. hashCode()
   D. new Hash()
   E. None of these

6. Which of the following types is capable of producing an object that could be used to “step through” the members of a Set, one element at a time?
   A. List
   B. Iterator
   C. String
   D. Map
   E. None of these

7. Which of the following is a valid declaration of a data member of a Store class? This data member is to hold an arbitrarily large number of Inventory objects.
   ```java
   public class Inventory {
   public Inventory(double price, String item) {
       this.price = (price>0)?value : .01;
       this.item = item;
   }

   public double getPrice() {
       return price;
   }

   public String getItem() {
       return item;
   }
   ```
private double price;
private String item;
}

A. private Set merchandise = new Set;
B. private Set merchandise = TreeSet(Inventory);
C. private Set merchandise = new HashSet();
D. private Inventory[] = new Inventory[];
E. More than one of these
MULTIPLE CHOICE

1. ANS: A  PTS: 1
2. ANS: C  PTS: 1
3. ANS: E  
Both A and B are appropriate  PTS: 1
4. ANS: D  PTS: 1
5. ANS: C  PTS: 1
6. ANS: B  PTS: 1
7. ANS: C  PTS: 1
public class Restaurant
{
    // methods and constructors not shown
    private String name;
    private boolean fourStar;
    private int seatingCapacity;
}

public class Menu
{
    boolean isENTREE()
    {
        return category == ENTREE;
    }

    // other methods and constructors not shown
    private String item;
    private int category;

    DESSERT = 0;
    ENTREE = 1;
    APPETIZER = 2;
    DRINK = 3;
}

1. Which of the following replaces each instance of `<>1>` in the code above to declare class constants that are accessible everywhere?

   A. private static final int
   B. static final int
   C. public static final int

2. Which of the following builds a Map named `mp` which can be used to map from restaurants to menus? (Refer to the code above.)

   A. Map mp = new Map( );
   B. Map mp = new Map(Restaurant, Menu);
   C. Map mp = new HashMap(Menu, Restaurant);
   D. Map mp = new TreeMap(Restaurant, Menu);
   E. None of these
3. Assume that $Map \ mp$ has been built correctly, and that $Restaurant \ fojos$ and $Menu \ chinese$ have been built correctly. Which of these adds to $Map \ mp$ the key $fojos$ with value $chinese$? (Refer to the code above.)

A. $mp.put(fojos.name, chinese.category)$;  
B. $mp[fojos] = chinese$;  
C. $mp.put[Chinese] = fojos$;  
D. $mp.put(fojos, chinese)$;  
E. None of these

4. Which of the following can be run outside class $Menu$ to check whether the menu associated with $Restaurant \ papas$ in $Map \ mp$ is an entrée? (Refer to the code above.)

A. $mp.get(papas).isENTREE( )$  
B. $mp.get(papas).category == Menu.ENTREE$  
C. $((Menu)mp.get(papas)).isENTREE( )$  
D. $((Menu)mp.get(papas)).category == ENTREE$  
E. None of these

5. Suppose that $StudentRecord$ is a user-defined class that holds personal information about students. Which of the following built-in classes can be used to make a student directory, matching each student’s name (stored as a String) with their information?

A. $ArrayList$  
B. $TreeMap$  
C. $TreeSet$  
D. $HashSet$  
E. More than one of these
MULTIPLE CHOICE

1. ANS: C   PTS: 1
2. ANS: E
   Answer is \textit{Map mp = new HashMap()} or \textit{Map mp = new TreeMap()}
   PTS: 1
3. ANS: D   PTS: 1
4. ANS: C   PTS: 1
5. ANS: B   PTS: 1
Singly Linked List (Lesson 49) ...Contest Type Problems

Multiple Choice
Identify the choice that best completes the statement or answers the question.

```java
public class Node {
    public Node(int i, String s, Node n) {
        v1 = i;
        s1 = s;
        next = n;
    }

    public int v1;
    public String s1;
    public Node next;
}
```

1. Given `ns` as an object of the class in the above code, how would you print data member `s1` of the `Node` object that follows `ns` in a singly linked chain of `Node` objects?

   A. `System.out.println(ns.s1);`
   B. `System.out.println((ns.next).s1);`
   C. `System.out.println(s1);`
   D. `System.out.println((Node)ns.next.s1);`
   E. None of these

2. Given `ns` as an object of the class in the code above, what would you use to determine if `ns` is the last object in a linked list?

   A. `if(ns == null)`
   B. `if(next == null)`
   C. `if(ns.next == null)`
   D. `if((ns.next).next == null)`
   E. None of these

3. Which of the following would be a proper way to instantiate a `Node` object if that object were to be the last in the linked list “chain”? (Refer to the code above.)

   A. `Node nn = new Node(4, “Yes”, null);`
   B. `Node nn = new Node(“Yes”, 4, null);`
   C. `Node nn = new Node(null, null, null);`
   D. `Node nn = new Node(1, “Zero”, new Node( ) );`
   E. None of these

4. What is true concerning the traversing of a singly linked list?

   A. It can only be traversed in one direction.
   B. In doing a traversal while searching for a particular element, you might be unlucky and have to traverse the entire list
   C. In doing a traversal while searching for a particular element, you might be lucky and only need to inspect the first item.
   D. All of the above
   E. None of these
5. Suppose a singly linked list of Cow objects has a reference to the first object called `headCow`. Which of the following is `headCow`?

A. A Cow object
B. The integer 0
C. A String that gives the value of the first String field of the first object in the chain
D. A String reference
E. None of these
MULTIPLE CHOICE

1. ANS: B    PTS: 1
2. ANS: C    PTS: 1
3. ANS: A    PTS: 1
4. ANS: D    PTS: 1
5. ANS: A    PTS: 1
LinkedList and Stack (Lesson 50) ...Contest Type problems

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. Consider a waitress handing off orders to a short-order cook, and the processing of those orders. This is an example of which of the following?

A. LIFO
B. FIFO
C. Stack
D. Queue
E. More than one of these

/* BigStack is a stack class using a LinkedList object as the underlying data structure. It maintains a stack of Integer objects. The head of the list is considered the top of the stack.*/

```java
class BigStack {
    LinkedList lkdList;

    public BigStack() {
        <#1>
    }

    public void push(int x) {
        <#2>
    }

    public int pop() {
        <#3>
    }
}
```

___ 2. What code should replace <#1> in the code above?

A. lkdList = new LinkedList();
B. LinkedList lkdList = new LinkedList();
C. lkdList.clear();
D. lkdList = new LinkedList;
E. None of these

___ 3. Assuming that <#1> above has been filled in correctly in the code above, what code would replace <#2> in order to implement a push operation on the stack?

A. lkdList.push(x);
B. lkdList.addFirst(x);
C. lkdList.addFirst("x");
D. lkdList.addLast(new Integer(x));
E. None of these

___ 4. Assuming that <#1> and <#2> above have been filled in correctly in the code above, what code would replace <#3> in order to implement a pop operation on the stack?

A. return lkdList.getLast();
B. return lkdList.removeFirst();
C. return (Integer)lkdList.removeFirst();
D. lkdList.removeFirst( );
E. return (Integer)lkdList.removeFirst( );
C. `llkList.getLast();`

5. Assuming `<#1>` and `<#3>` have been filled in correctly in the code above, which of the following would be a correct usage of the `pop` method? (Assume this code is in the `main` method of some other class and that the `BigStack` object, `bs`, already exists.)

A. `bs.pop();`
B. `System.out.println(bs.pop());`
C. `int pk = bs.pop();`
D. All of the above
E. None of these

6. What code should replace `<#1>` in the code below in order to correctly implement the `peek` method?

```java
/*peek method returns the top item (int equivalent) of a stack without removing it. The underlying data structure is a LinkedList object, myList. The end of the list is considered the top of the stack.*/
public int peek()
{
    <#1>
}
```

A. `return (Integer)myList.getFirst();`
B. `return myList.getFirst();`
C. `(Integer)myList.getLast();`
D. `return (Integer)myList.getLast();`
E. None of these

7. Suppose we wish to store several items of data in a particular sequence and then retrieve them in reverse sequence. Which of the following would be best suited to this job?

A. Queue
B. Stack
C. Stack and queue would work equally well
D. Tree
E. None of these

8. Which of the following statements is true?

A. Linked lists always have better runtime performance than arrays.
B. When working with an array that is dimensioned too small, and the amount of data is unpredictable, there is a danger of running out of space.
C. If we are unable to predict a list’s maximum size, then a linked list may be the most efficient usage of memory.
D. Both A and B
E. Both B and C

9. Which of the following package names will import the `LinkedList` class?

A. `java.io`
B. `java.util`
C. `java.lang`
D. `java.awt`
E. None of these

10. Which of the following will store in `String pugh` the result of popping a stack object called `theStack` which stores `Strings` as `Object` type objects? (Assume that generics were not used in the creation of `theStack`.)
A. pugh = theStack.pop( );
B. pugh = ((String)theStack).pop( );
C. pugh = (String)theStack.pop( );

D. pugh = new theStack.pop( );
E. pugh = theStack.pop(new String s);

11. Suppose that Strings “One”, “Two”, and “Three” are successively pushed onto Stack st1. All are popped off, and as each String is popped, it is immediately pushed onto Stack st2. What is returned by the toString method of st2?

A. “[Three, Two, One]”
B. “[One, Two, Three]”
C. “(Three, Two, One)”

D. “(One, Two, Three)”
E. None of these

12. What is printed by the following code?

```java
Stack st = new Stack( );
st.push(“Black”);
st.push(“Beard”);
String str1 = (String)st.peek( );
st.push(“the”);
st.push(str1);
String str2 = (String)st.pop( );
st.push(“Pirate”);
System.out.println(str2);
while(!st.isEmpty)
{
    System.out.print((String)st.pop( ) + “ ”);
}
```

A. Black Beard the pirate
B. pirate the Beard Black
C. thepirate the Beard Black

D. BeardPirate the Beard Black
E. None of these
MULTIPLE CHOICE

1. ANS: E
   B and D are both appropriate

   PTS: 1

2. ANS: A  PTS: 1
3. ANS: B  PTS: 1
4. ANS: E  PTS: 1
5. ANS: D  PTS: 1
6. ANS: D  PTS: 1
7. ANS: B  PTS: 1
8. ANS: E  PTS: 1
9. ANS: B  PTS: 1
10. ANS: C  PTS: 1
11. ANS: A  PTS: 1
12. ANS: D  PTS: 1
Binary Search (Lesson 51) ...Contest Type Problems

Multiple Choice

*Identify the choice that best completes the statement or answers the question.*

**public static boolean binSrch(Comparable p[], int start, int end, Comparable thing) {**

```java
if(start > end)
    return false;
int m = (start + end)/2;
if (p[m].equals(thing))
    return true;
else if(p[m].compareTo(thing)<0)
    return binSrch(p, m + 1, end, thing)
else
    return binSrch(p, start, m-1, thing)
}
```

**1.** Call the *binSrch* method shown above with *binSrch(str, 0, str.length - 1, “epsilon”).* How many times is the *compareTo* method called if the *str* array is as follows?

- A. 0
- B. 1
- C. 2
- D. 3
- E. 4

**2.** What figure of merit does a time complexity analysis of the code above yield?

- A. O(n)
- B. O(n²)
- C. O(log n)
- D. O(2ⁿ)
- E. None of these

**3.** What must be required of an array upon which a binary sort is to be done?

- A. Must be sorted in ascending order
- B. Must be sorted in descending order
- C. Either A or B
- D. Can only be of a primitive type, no objects allowed
- E. None of these

```java
public static boolean binarySearch(Comparable x[], Object srchVal) {
    int left = 0, right = x.length-1;
    do
    {
        int m = <#1>;
        int cmp = x[m].compareTo(srchVal);
```
if(<#2>)
{
    return true;
}
else if(cmp > 0)
{
    right = m - 1;
}
else
{
    left = m + 1;
}
}while(right>=left);
return false;

___ 4. What replaces <#1> in the code above so that a binary search is correctly done?

A. left/2 + right/2
B. (left + right)/2
C. .5 * (right + left)
D. Both A and B
E. None of these

___ 5. What replaces <#2> in the code above so that a binary search is correctly done?

A. cmp == 0
B. cmp < 0
C. cmp > 0
D. cmp <=0
E. None of the these

___ 6. Which of the following would replace <#1> in the code below so that a binary search is correctly done?

//binary search
public static boolean seek(Comparable p[], int init, int fini, Comparable lookFor)
{
    if(<#1>)
        return false;
    int m = (init + fini)/2;
    if (p[m].equals(lookFor))
        return true;
    else if(p[m].compareTo(lookFor)<0)
        return seek(p, m + 1, fini, lookFor)
    else
        return seek(p, init, m-1, lookFor)
}

A. init >= fini
B. init > fini
C. init < fini
D. init <= fini
E. None of these
7. Which of the following is a legitimate way to search an unsorted integer array called \( bj \) for the value stored in \( int i \), and print \textit{true} if it’s found and \textit{false} if not found.

A. \texttt{System.out.println( Arrays.binarySearch(bj, i) );}
B. \texttt{Arrays.sort(bj);
    System.out.println( Arrays.binarySearch(bj, i) >= 0 );}
C. \texttt{System.out.println( Arrays.binarySearch(i, bj) );}
D. \texttt{Arrays.sort(bj);
    System.out.println( Arrays.binarySearch(bj, i) );}
E. \texttt{None of these}
## MULTIPLE CHOICE

1. ANS: C  
   PTS: 1
2. ANS: C  
   PTS: 1
3. ANS: C  
   PTS: 1
4. ANS: D  
   PTS: 1
5. ANS: A  
   PTS: 1
6. ANS: B  
   PTS: 1
7. ANS: B  
   PTS: 1
Binary Search Tree (Lesson 52) ...Contest Type Problems

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

```java
//Binary Search Tree
public class Bst {
    public Bst(Comparable addValue) {
        info = addValue;
    }

    public Bst addNd(Comparable addValue) {
        int cmp = info.compareTo(addValue);
        if(cmp<0) {
            if(rightNd!=null) {
                rightNd.addNd(addValue);
            } else {
                rightNd=new Bst(addValue);
            }
        } else if(cmp>0) {
            if(leftNd!=null) {
                leftNd.addNd(addValue);
            } else {
                leftNd=new Bst(addValue);
            }
        }
        return this;
    }

    public void transverseAndPrnt() {
        /*1*/
    }

    private Comparable info;
    private Bst leftNd;
    private Bst rightNd;
}
```

1. Which of the following replaces `/*1*/` in the code above to make the `traverseAndPrnt` method visit and print every node in a “Postorder” fashion?

   A. if(leftNd != null) leftNd.traverseAndPrnt();
      System.out.print(info);
Nd != null) rightNd.traverseAndPrnt();

B. if (leftNd != null) leftNd.traverseAndPrnt();
   if (rightNd != null) rightNd.traverseAndPrnt();
   System.out.print(info);

C. System.out.print(info);
   if (leftNd != null) leftNd.traverseAndPrnt();
   if (rightNd != null) rightNd.traverseAndPrnt();

D. leftNd.traverseAndPrnt();
   rightNd.traverseAndPrnt();

E. None of these

2. Assume <1> has been filled in correctly. Which of the following creates a Bst object obj and adds 55 as a wrapper class Integer? (Refer to the code above.)

A. Integer J;
   J = 55;
   Bst obj = new Bst(J);

B. Bst obj = new Bst(new Integer(55));

C. Bst obj;
   obj.addNd(55);

D. Bst obj;
   obj.addNd(new Integer(55));

E. None of these

3. Assume <1> has been filled in correctly and that n objects are added to an object of type Bst in order from largest to smallest. What is the Big O value for searching this tree? (Refer to the code above.)

A. O(n log n)

B. O(log n)

C. O(n)

D. O(n²)

E. None of these

//Binary Search Tree
public class Bst
{
    public Bst(Comparable addValue)
    {
        info = addValue;
    }

    public Bst addNd(Comparable addValue)
    {
        int cmp = info.compareTo(addValue);
    }
if(cmp<0)
{
    if(rightNd!=null)
        rightNd.addNd(addValue);
    else
        rightNd=new Bst(addValue);
} else if(cmp>0)
{
    if(leftNd!=null)
        leftNd.addNd(addValue);
    else
        leftNd=new Bst(addValue);
} return this;

public void transverseAndPrnt()
{
    /*1*/
}

private Comparable info;
private Bst leftNd;
private Bst rightNd;

4. When a Bst object is constructed, to what value will leftNd and rightNd be initialized? (Refer to the code above.)
   A. this  D. Bst object
   B. 0  E. None of these
   C. null

5. After executing the code below, what does the resulting tree look like? (Also refer to the code above.)
   Bst obj = new Bst(new Integer(11));
   obj.add(new Integer(6))
   obj.add(new Integer(13));

   A. ArithmeticException  D. 
   B.  
   E. None of these
6. What replaces <*
1> in the code above so that a “Preorder” traversal is done?

A. if(leftNd != null) leftNd.traverseAndPrnt( );
   System.out.print(info);
   if(rightNd!=null)rightNd.traverseAndPrnt();

B. if(leftNd != null) leftNd.traverseAndPrnt( );
   if(rightNd!=null)rightNd.traverseAndPrnt();
   System.out.print(info);

C. System.out.print(info);
   if(leftNd != null) leftNd.traverseAndPrnt( );
   if(rightNd!=null)rightNd.traverseAndPrnt();

D. leftNd.traverseAndPrnt( );
   rightNd.traverseAndPrnt( );

E. None of these

7. What is a disadvantage of an unbalanced Binary Search Tree?

A. No disadvantage  
B. Uses excessive memory  
C. Limited accuracy

D. Reduced search efficiency

E. None of these

8. Average case search time for a Binary Search Tree that is reasonably balanced is of what order?

A. O(n log n)  
B. O(n²)

D. O(1)

C. O(n)

E. None of these

9. What positive thing(s) can be said about a completely unbalanced tree that results from adding the following integers to a tree in the sequence shown?

{ 5, 6, 7, … 999, 1000}

A. The items are automatically in numerical order along the long sequential strand.
B. The smallest number is automatically the root node.
C. The largest number is the root node.
D. Both A and B
E. Both A and C
10. In what order are the nodes visited in the tree above if a preorder traversal is done?

B. M, G, A, H, R, P, N, Q, X
C. A, H, G, N, Q, P, X, R, M

11. In what order are the nodes visited in the tree above if a postorder traversal is done?

B. M, G, A, H, R, P, N, Q, X
C. A, H, G, N, Q, P, X, R, M

12. In what order are the nodes visited in the tree above if an inorder traversal is done?

B. M, G, A, H, R, P, N, Q, X
C. A, H, G, N, Q, P, X, R, M

13. For the tree above, which of the following is a possible order in which the nodes were originally added to the binary search tree?

A. M, G, R, A, H, X, P, N, Q

14. What mathematical infix expression is represented by the binary expression tree below?

A. (4 + 3) / 7
B. 4 / (3 + 7)
C. 7 / 4 / 3 + 7
D. (4 / 3) + 7
E. None of these

15. What mathematical infix expression is represented by the binary expression tree below?
16. Which of the following is a postfix version of the following mathematical expression?

\[(37 - 59) * ((4 + 1) / 6)\]

A. \[\ast \ - \ 37 \ 59 \ / \ + \ 4 \ 1 \ 6\]
B. \[(37 - 59) * ((4 + 1) / 6)\]
C. \[37 \ 59 \ - \ 4 \ 1 \ + \ 6 \ / \ \ast\]
D. \[37 - 59 \ * \ 4 \ + \ 1 \ / \ 6\]
E. None of these

17. What is the minimum number of levels for a binary tree with 20 nodes?

A. 20
B. 7
C. 6
D. 5
E. None of these

18. What is the maximum number of levels for a binary tree with 20 nodes?

A. 20
B. 7
C. 6
D. 5
E. None of these
MULTIPLE CHOICE

1. ANS: B PTS: 1
2. ANS: B PTS: 1
3. ANS: C PTS: 1
4. ANS: C PTS: 1
5. ANS: B PTS: 1
6. ANS: C PTS: 1
7. ANS: D PTS: 1
8. ANS: E
   Real answer is O(log(n))
   PTS: 1
9. ANS: D PTS: 1
10. ANS: B PTS: 1
11. ANS: C PTS: 1
12. ANS: A PTS: 1
13. ANS: A PTS: 1
14. ANS: D PTS: 1
15. ANS: B PTS: 1
16. ANS: C PTS: 1
17. ANS: D PTS: 1
18. ANS: A PTS: 1
Multiple Choice

Identify the choice that best completes the statement or answers the question.

___ 1. What code should replace <#1> in the code above in order that the dequeue method be properly implemented?

A. for(int j=0; j<size-1; j++)
   intValues[j] = intValues[j+1];

B. for(int j=0; j<size-1; j++)
   intValues[j+1] = intValues[j];

C. for(int j=0; j<size/2; j++)
   intValues[j] = intValues[j+1];

D. for(int j=0; j<size/2; j++)
   intValues[j] = intValues[j-1];

E. None of these

Queues (Lesson 53) ...Contest Type Problems
2. What code should replace `<#2>` in the code above in order that the `peekFront` method be properly implemented?

A. return intValues[1];  
B. return intValues[0];  
C. return intValues[size];  
D. return intValues[size-1];  
E. None of these

3. Assuming that `<#1>` and `<#2>` have been properly filled in, what is output by the code below? (Also, refer to the code above.)

```java
IntQueue q = new IntQueue(100);
q.enqueue(36);
q.enqueue(21);
q.enqueue(7);
System.out.println(q.peekFront() + q.dequeue());
```

A. 72  
B. 3621  
C. 2136  
D. 28  
E. None of these

4. Assuming that `<#1>` and `<#2>` have been properly filled in, what is the running time for a `dequeue` method call if a total of $n$ objects have previously been enqueued and nothing has yet been dequeued? (Refer to the code above.)

A. $O(1)$  
B. $O(n^2)$  
C. $O(\log n)$  
D. $O(n)$  
E. None of these

5. Assuming that `<#1>` and `<#2>` have been properly filled in, what is output by the following code? (Also refer to the code above.)

```java
IntQueue q = new IntQueue(20);
q.enqueue(3);
q.enqueue(q.dequeue());
System.out.println(q.size);
```

A. 0  
B. 1  
C. 2  
D. throws exception  
E. None of these

```java
public class StringQueue  
{
    public StringQueue(String str)  
    {  
        enqueue(str);  
    }  
    public void enqueue(String s) { … }  
    public String dequeue() { … }  
    public String peekFront() { … }
```
public Boolean isEmpty() { … }

… state variables and not shown …

6. In the class above, which default constructor could be added to the class that would automatically enqueue the String “Santa Claus” when an object is created with this constructor?

A. public default StringQueue( );
   { enqueue(“Santa Claus”); }  
B. Illegal, can’t have two constructors  
C. public StringQueue( )
   { enqueue(“Santa Claus”); } 
D. public StringQueue(“Santa Claus”)
   { enqueue(this); }  
E. None of these

7. Assuming the correct default constructor is properly added to the class above which of the following would be an appropriate way to create a StringQueue object?

A. StringQueue q = new StringQueue(“gesundheit”);  
B. StringQueue q = new StringQueue( );  
C. StringQueue q = new StringQueue;  
D. More than one of these  
E. None of these

8. Assume the DblQ class queues double precision numbers via the enqueue method and returns doubles via the dequeue method. What is output by the code below?

DblQ dq = new DblQ( );
  dq.enqueue(5.01);
  dq.enqueue(5.02);
  dq.enqueue(5.03);
  System.out.print( dq.dequeue( ) + dq.dequeue( ) );
  System.out.println( dq.dequeue( ) );

A. 5.015.025.03  
B. throws exception  
C. 5.035.025.01  
D. 15.06  
E. None of these

9. Which of the following is true of both stacks and queues?

A. The items are stored in a definite sequence.  
B. Items in the middle of the sequence of items are directly and immediately accessible.  
C. Items can be removed from only one end of the sequence of items stored.  
D. More than one of these  
E. None of these

10. Qclass is a class implementing an ArrayList based queue. What will be the output of the code below?
Qclass qq = new Qclass();

System.out.println(qq.dequeue());
qq.enqueue("foggy nights");
System.out.println(qq.dequeue());

A. throws exception  D. Nothing
B. null          E. None of these
C. foggy nights
MULTIPLE CHOICE

1. ANS: A  PTS: 1
2. ANS: B  PTS: 1
3. ANS: A  PTS: 1
4. ANS: D  PTS: 1
5. ANS: B  PTS: 1
6. ANS: C  PTS: 1
7. ANS: D  
   ...A and B both are correct.
   PTS: 1
8. ANS: E  
   ...Real answer is 10.035.03
   PTS: 1
9. ANS: D  
   ...A and C are both correct.
   PTS: 1
10. ANS: A  PTS: 1
public static <#1> hashCode(String key, int table_len)
{
    keyInt = 0;
    for(int j = 0; j<=2; j++)
    {
        keyInt = 10*keyInt + key.charAt[j];
    }
    return <#2>;
}

1. What code replaces <#1> in the hash code method above?
   A. int  
   B. long  
   C. double  
   D. String  
   E. None of these

2. Assuming that <#1> has been filled in properly in the code above, which of the following would be an appropriate replacement code for <#2>?
   A. key % table_len  
   B. table_len % key  
   C. keyInt % table_len  
   D. table_len % keyInt  
   E. None of these

3. Assuming that <#1> and <#2> have been filled in correctly and if the method above is called with the following code, what is returned?
   ilds = hashCode(“AB”);
   A. throws an exception  
   B. 816  
   C. 7227  
   D. “AB”  
   E. None of these

4. Assuming that <#1> and <#2> have been filled in correctly and if the method above is called with the following code, what is returned?
   ilds = hashCode(“ABC”);
   A. throws an exception  
   B. 816  
   C. 7227  
   D. “ABC”  
   E. None of these

5. If the code below is part of a probing function used for resolving collisions in a hash table, which type of probing is most likely being done?
indxSeed = 1;
boolean foundIt = true;
while(foundIt)
{
    indx = indxSeed * indxSeed;
    indxSeed++;
    if(key == keyArray[indx])
    {
        foundIt = false;
    }
}
MULTIPLE CHOICE

1. ANS: A  PTS: 1
2. ANS: C  PTS: 1
3. ANS: A  PTS: 1
4. ANS: C  PTS: 1
5. ANS: D  PTS: 1
6. ANS: E  PTS: 1
...B, C, and D are all true.

7. ANS: B  PTS: 1
8. ANS: B  PTS: 1
Nugget 1...Quiz

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

1. What is printed by the following code?

```java
int k = 3;
for (int pj = 5; pj <= 100; pj++)
{
    k = pj + 1;
}
System.out.println(3 * k + pj);
```

A. Won’t compile  
B. Never prints, endless loop  
C. 3082  
D. 5820  
E. None of these

2. What is printed by the following code?

```java
int jj = 2;
do
{
    int gk = 1 + jj++;
}
while(jj < 10);
System.out.println(gk);
```

A. Won’t compile  
B. Never prints, endless loop  
C. 45  
D. 55  
E. None of these

**Multiple Response**
*Identify one or more choices that best complete the statement or answer the question.*

3. What are the various names we give to variables that are shared among all the methods of an object?  
(There is more than one answer)

A. Shared variables  
B. Instance fields  
C. Used variables  
D. Data members  
E. State variables
MULTIPLE CHOICE

1. ANS: A  
The scope of \( p_j \) is limited to inside the loop.  
PTS: 1

2. ANS: A  
The scope of \( g_k \) is limited to inside the loop.  
PTS: 1

MULTIPLE RESPONSE

3. ANS: B, D, E  
PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Name a method that represents overriding. (Refer to the code above.)
   A. method1  
   B. method2  
   C. jello

2. Name a method that represents overloading. (Refer to the code above.)
   A. method1  
   B. method2  
   C. jello

3. Name a method that represents polymorphism. (Refer to the code above.)
   A. method1  
   B. method2  
   C. jello
MULTIPLE CHOICE

1. ANS: B
   ... method2...in both the *Dude* and *DuckSoup* classes. Objects made with the *DuckSoup* class will use its method2 in preference to method2 in the *Dude* class.

   PTS: 1

2. ANS: C
   PTS: 1

3. ANS: A
   method1...in both the *FritoPie* and *DuckSoup* classes. They have nothing to do with each other...totally unrelated.

   PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What is printed by the following?

```java
String s = "abcd123efgh456";
String sp[] = s.split("\D+"};
System.out.println(sp.length + sp[1]);
```

A. 3123  
B. 2123  
C. 2efgh  
D. 3efgh  
E. 3456

2. What does it mean when a class “realizes” an interface?

A. The class inherits the interface  
B. The class implements the interface  
C. The class extends the interface  
D. The class is aware of the interface  
E. None of these

3. What is printed by the following?

```java
System.out.println(0x47 ^ 0xA3);
```

A. 3  
B. 231  
C. E4  
D. 228  
E. None of these
Nugget 3 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: A     PTS: 1
2. ANS: B     PTS: 1
3. ANS: D

Exclusive OR
hex 47 = 0100 0111
hex A3 = 1010 0011
1110 0100 = E4<sub>16</sub> = 228<sub>10</sub>

PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. String sss = “I like school”;
   Using the two parameter form of substring, which line of code will print the last character of sss?
   A. System.out.println( sss.substring(12, 13) );
   B. System.out.println( sss.substring(12) );
   C. System.out.println( sss.substring(12, 11) );
   D. System.out.println( sss.substring(12, 14) );
   E. None of these

2. String sss = “I like school”;
   Using the one parameter form of substring, which line of code will print the last character of sss?
   A. System.out.println( sss.substring(11) );
   B. System.out.println( sss.substring(12) );
   C. System.out.println( sss.substring(13) );
   D. System.out.println( sss.substring(12, 14) );
   E. None of these

3. String sss = “I like school”;
   Using charAt, which line of code will print the last character of sss?
   A. System.out.println( sss.charAt(11) );
   B. System.out.println( sss.charAt(12) );
   C. System.out.println( sss.charAt(13) );
   D. System.out.println( sss.charAt(14) );
   E. None of these

4. Assume s is a String. Using the two-parameter form of substring, which line of code will print the last character of s?
   A. System.out.println( s.substring( s.length( ) - 1, s.length( ) ) );
   B. System.out.println( s.substring( s.length( ), s.length( ) ) );
   C. System.out.println( s.substring( s.length( ) + 1, s.length( ) ) );
   D. System.out.println( s.substring( s.length( ) - 1, s.length( ) ) );
   E. None of these

5. Assume s is a String. Using the one-parameter form of substring, which line of code will print the last character of s?
   A. System.out.println( s.substring( s.length( ) - 1 ) );
   B. System.out.println( s.substring( s.length( ) + 1 ) );
   C. System.out.println( s.substring( s.length( ) ) );
   D. System.out.println( s.substring( s.length( ) - 1 ) );
   E. None of these

6. Assume s is a String. Using charAt, which line of code will print the last character of s?
A. System.out.println( s.charAt(s.length -1 ) );
B. System.out.println( s.charAt(s.length( ) ) );
C. System.out.println( s.charAt(s.length( ) +1 ) );
D. System.out.println( s.charAt(s.length( ) -1 ) );
E. None of these

7. Which is the signature of a method that receives a String parameter and returns a double array? The method name is famGrig.

A. public String[] famGrig(double d)  
B. public double[] famGrig(String s)  
C. public double[] famGrig(String s)  
D. public String famGrig(double d[])  
E. None of these

8. Which represents the body of the method that returns a double array in which that array consists of the square roots of the odd integers from 1 to 9?

A. public double[] famGrig( )
   {
      int indx = 0;
      double temp[] = new double[5];
      for(int j=1; j<=9; j++)
         temp[j] = Math.sqrt(j);
      return temp;
   }
B. public double[] famGrig( )
   {
      int indx = 0;
      double temp[] = new double[5];
      for(int j=1; j<=9; j++, indx++)
         temp[indx] = Math.sqrt(j);
      return temp;
   }
C. public double[] famGrig( )
   {
      int indx = 0;
      double temp[] = new double[5];
      for(int j=1; j<=9; j+=2, indx++)
         temp[indx] = Math.sqrt(j);
      return temp;
   }
D. None of these

9. Which line of code below calls method1 and then assigns the returned array to the double array xc? (The signature of method1 is shown below.)

   public double[] method1(int i, String s)

A. double xc[];  
B. double xc;

xc[] = method1("Hello", 3);  
xc[] = method1(3, "Hello");

B. double xc[];
   xc = method1("Hello", 3);
C. double xc[];
   xc = method1(3, "Hello");

10. What is printed by the following?

   String p = “ABCDE”;
   System.out.println("X" + p.substring(2,2) + "X");

A. Illegal, won’t compile  
B. XBX  
C. XCX  
D. XX  
E. None of these
MULTIPLE CHOICE

1. ANS: APTS: 1
2. ANS: BPTS: 1
3. ANS: BPTS: 1
4. ANS: APTS: 1
5. ANS: APTS: 1
6. ANS: DPTS: 1
7. ANS: BPTS: 1
8. ANS: CPTS: 1
9. ANS: CPTS: 1
10. ANS: DPTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. In this problem “bit positions” are numbered starting with 0 at the least significant bit position (…3, 2, 1, 0). What will be the result (in decimal form) of a bitwise AND between $187_{dec}$ and a mask (in binary form) of all zeros except for a one in the bit 5 position?

A. 4  D. 32
B. 8  E. None of these
C. 16

2. In this problem “bit positions” are numbered starting with 0 at the least significant bit position (…3, 2, 1, 0). What will be the result (in decimal form) of a bitwise AND between $204_{dec}$ and a mask (in binary form) of all zeros except for a one in the bit 2 position?

A. 4  D. 32
B. 8  E. None of these
C. 16

3. In this problem “bit positions” are numbered starting with 0 at the least significant bit position (…3, 2, 1, 0). If we use `(int)Math.round( Math.pow(2, 4) )` as a mask, what bit position are we trying to examine?

A. 2  D. 16
B. 4  E. None of these
C. 8

4. In this problem “bit positions” are numbered starting with 0 at the least significant bit position (…3, 2, 1, 0). Which code fragment will decide if bit position 4 of the integer $q$ is a 1 or a 0?

A. if ( (q & 16) > 0 )
   {
       System.out.println("Bit 4 is a 1.");
   }
else
   {
       System.out.println("Bit 4 is a 0.");
   }

B. if ( (q & 16) < 0 )
   {
       System.out.println("Bit 4 is a 1.");
   }
else
   {
       System.out.println("Bit 4 is a 0.");
   }

C. if ( (q & 16) > 0 )
   {
   }
System.out.println("Bit 4 is a 1.");
}
else
{
    System.out.println("Bit 4 is a 0.");
}

D. if ( (q | 16) > 0 )
{
    System.out.println("Bit 4 is a 1.");
}
else
{
    System.out.println("Bit 4 is a 0.");
}

E. None of these
Lesson 5 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: D  PTS: 1
2. ANS: A  PTS: 1
3. ANS: B  PTS: 1
4. ANS: A  PTS: 1
public interface MyInterface
{
  int theMethod(double d);
}

class MyClass implements MyInterface
{
  public int theMethod(double d)
  {
    ... some code ...
  }

  public void anotherMethod(int x)
  {
    ... some code ...
  }
}

MyInterface myObj = new MyClass();

1. Is myObj.anotherMethod(2) a legal call? (Refer to the code above.)
   A. Yes  
   B. No  

2. Is myObj.theMethod(13.2) a legal call? (Refer to the code above.)
   A. Yes  
   B. No  

3. Which is the implementing class? (Refer to the code above.)
   A. MyClass  
   B. MyInterface  
   C. theMethod  
   D. anotherMethod  
   E. None of these  

4. What’s printed by the code below?
   int k = 23;
   System.out.println(Integer.toBinaryString(k));
   A. 10101  
   B. 11111  
   C. 10110  
   D. 10011  
   E. None of these  

5. What code that will print out the hex equivalent of int m?
   A. System.out.println( Integer.toString(m, “hex”));
B. `System.out.println( Integer.toHexString(m) );`
C. `System.out.println( Integer.toString(m) );`
D. `System.out.println( Integer.toString(m, 16) );`
E. More than one of these

6. What code will print out the octal equivalent of `int m`?

A. `System.out.println( Integer.toString(m, “oct”) );`
B. `System.out.println( Integer.toOctalString(m) );`
C. `System.out.println( Integer.toString(m) );`
D. `System.out.println( Integer.toString(m, 8) );`
E. More than one of these
MULTIPLE CHOICE

1. ANS: B  PTS: 1
2. ANS: A  PTS: 1
3. ANS: A  PTS: 1
4. ANS: E  
   ...answer is 10111  
   PTS: 1
5. ANS: E  
   ...both B and D  
   PTS: 1
6. ANS: E  
   ...both B and D  
   PTS: 1
Nugget 7 ...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. What is printed by the following?

```java
String s1 = "m";
String s2 = "Z";
System.out.println(s1.compareTo(s2));
```

A. A positive number  
B. A negative number  
C. 0
D. true  
E. false

___ 2. What is printed by the following?

```java
StringBuffer s = new StringBuffer("Dude, where’s my car?");
s.insert(4, "zack");
System.out.println(s);
```

A. Dudezack  
B. Dudzack  
C. Dudzacke, where’s my car?  
D. Dudezack, where’s my car?  
E. None of these

___ 3. What is printed by the following?

```java
int x = 9;
double y = 1.3;
String s = "Felix";
System.out.println(x + y + s + x + y);
```

A. 91.3Felix91.3  
B. 10.3Felix91.3  
C. 91.3Felix10.3  
D. Illegal, won’t compile  
E. None of these
## Nugget 7 ...Quiz

**Answer Section**

### MULTIPLE CHOICE

<table>
<thead>
<tr>
<th></th>
<th>ANS:</th>
<th>PTS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>D</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>B</td>
<td>1</td>
</tr>
</tbody>
</table>
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What code that will print the following?
   Cat"hello"X'm'
   A. System.out.println("Cat/"hello"X'm'");
   B. System.out.println("Cat/"hello"X'm'");
   C. System.out.println("Cat/"hello"X'm'");
   D. System.out.println("Cat"hello"X'm'");
   E. None of these

2. What are all objects equal to before they are initialized?
   A. null
   B. zero
   C. ""
   D. Illegal. They must be initialized when declared.
   E. None of these

3. What code replaces <##> below so as to make it skip the remaining code in the loop, but still continue looping?
   for(j = 0; j < 10; j++)
   {
       if (j >= 5)
       {
           <##>
           m = j * 2;
       }
       m = j + 2;
       sum = sum + m;
   }
   A. continue;
   B. break;
   C. exit;
   D. stop;
   E. None of these

4. What replaces <???> in the following code so that when “condition x” is true we break out of the outer loop?
   myLabel:
   while ( …outer loop condition…) 
   {
       while ( …inner loop condition…) 
       {
           if ( …“condition x”… )
           {
               <???>
           }
       }
A. break myLabel;  
B. break;  
C. continue;  
D. continue myLabel;  
E. None of these
Nugget 8 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: C  PTS: 1
2. ANS: A  PTS: 1
3. ANS: A  PTS: 1
4. ANS: A  PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. What is printed by the following code?

```java
int x = 5;
double y = (x >8) ? Math.pow(x,2) : Math.pow(x,3);
System.out.println(y);
```

A. Illegal, won’t compile  
B. 125  
C. 125.0  
D. 1.25E0  
E. None of these

___ 2. What is printed by the following code?

```java
int x = 462;
if(~x > 0)
{
    System.out.println("positive");
}
else
{
    System.out.println("negative");
}
```

A. Illegal, won’t compile  
B. positive  
C. negative  
D. Nothing is printed

___ 3. What is printed by the following?

```java
System.out.println(20>>2);
```

A. 10  
B. 5  
C. 40  
D. .1  
E. None of these

___ 4. What is printed by the following?

```java
System.out.println(5<<3);
```

A. 40  
B. 15  
C. 2  
D. .625  
E. None of these

___ 5. What is printed by the following?

```java
System.out.println(-6<<3);
```

A. -2  
B. None of these  
D. -48
6. What is printed by the following?

```java
if ( (-72>>>2) > 0)
{
    System.out.println("positive");
}
else
{
    System.out.println("negative");
}
```

A. Illegal, won’t compile  
B. positive  
C. negative  
D. Nothing is printed  
E. None of these

7. What is printed by the following?

```java
System.out.println(17.2%4);
```

A. 1.2  
B. 4.3  
C. 1  
D. 1.0  
E. None of these
Nugget 9 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: C    PTS: 1
2. ANS: C    PTS: 1
3. ANS: B
   \[20 / 2^2\]
   PTS: 1
4. ANS: A
   \[5 \times 2^3\]
   PTS: 1
5. ANS: D    PTS: 1
6. ANS: B    PTS: 1
7. ANS: A    PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What do the d and f arrays both look like after this code runs:
   ```java
double d[ ] = {1, 2, 3, 4, 5, 6, 7};
double f[ ] = {10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20};
System.arraycopy(d, 2, f, 1, 3);
```
   A. d = {10, 3, 4, 5, 14, 15, 16, 17, 18, 19, 20};
      f = {1, 2, 3, 4, 5, 6, 7}
   B. d = {1, 2, 3, 4, 5, 6, 7}
      f = {10, 3, 4, 5, 14, 15, 16, 17, 18, 19, 20};
   C. d = {1, 2, 3, 4, 5, 6, 7}
      f = {3, 4, 5, 13, 14, 15, 16, 17, 18, 19, 20};
   D. d = {1, 2, 3, 4, 5, 6, 7}
      f = {10, 11, 3, 4, 5, 15, 16, 17, 18, 19, 20};
   E. None of these

2. If a constant is not initialized when it is declared as a state variable, where is the only place in which it can be initialized?
   A. There is no other place               D. In a constructor
   B. In any method                        E. None of these
   C. In any non static method

3. What code replaces `<#1>` in order to call the other constructor and send it values of 18 and 23.99?
   ```java
   public class Hippo
   {
      public Hippo(String mon)
      {
         `<#1>`
      }
      public Hippo(int z, double x )
      {
         gh =23 + z;
         d = x * 2;
      }
      …more code …
   }
   A. Can’t be done               D. this(23.99, 18);
B. super(18, 23.99);  
C. this(18, 23.99);  
E. None of these
Nugget 10 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B  PTS:  1
2. ANS: D  PTS:  1
3. ANS: C  PTS:  1
Nugget 11 Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Which of the following is a physical example of a LIFO?
   A. A stack of trays in a cafeteria
   B. A line of people buying tickets at a box office
   C. A line of cars waiting at a stop-light
   D. People seated in a movie theater
   E. None of these

2. Which of the following is a physical example of a FIFO?
   A. A stack of trays in a cafeteria
   B. A line of people buying tickets at a box office
   C. A line of cars waiting at a stop-light
   D. More than one of these
   E. None of these

3. Does the conditional part of the if below return a true, false, or give an error?
   ```java
   int x = 3, y = 5;
   if ( (x < 8 ) & (y > -1) )
   {
       ...some code...
   }
   ```
   A. true
   B. false
   C. error

4. Does the conditional part of the if below return a true, false, or give an error?
   ```java
   int x = 3, y = 5;
   if ( (x < 8 ) && (y > -1) )
   {
       ...some code...
   }
   ```
   A. true
   B. false
   C. error

5. Of which of the following is \( y *= z + m \) the equivalent?
   A. \( y = y * (z + m) \)
   B. \( y = y * z + m \)
   C. Neither of these

6. What is printed by the following?
   ```java
   System.out.println(-12%5);
   ```
7. What is printed by the following?

```java
System.out.println( 12%(-5) );
```

A. 2  
B. -2  
C. Illegal, won’t compile  
D. -2.4  
E. None of these

8. What is printed by the following?

```java
System.out.println( -12%(-5) );
```

A. 2  
B. -2  
C. Illegal, won’t compile  
D. 2.4  
E. None of these
MULTIPLE CHOICE

1. ANS: A  PTS: 1
2. ANS: D  PTS: 1
   ...both B and C
3. ANS: A  PTS: 1
4. ANS: A  PTS: 1
5. ANS: A  PTS: 1
6. ANS: B  PTS: 1
7. ANS: A  PTS: 1
8. ANS: B  PTS: 1
Nugget 12 ...Quiz

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

1. What is printed by the following?
   ```java
   int x = 7;
   int y = 3;
   double d = (double)(x/y);
   System.out.println(d);
   ```

   A. 2  
   B. 2.0  
   C. 2.33333333333333  
   D. Illegal, won’t compile  
   E. None of these

2. What is printed by the following?
   ```java
   int x = 7;
   int y = 3;
   double d = (double)x/y;
   System.out.println(d);
   ```

   A. 2  
   B. 2.0  
   C. 2.33333333333333  
   D. Illegal, won’t compile  
   E. None of these

3. Specify the accessibility provided by *public*:

   A. Accessible from anywhere  
   B. Accessible from just within its own class  
   C. All methods of classes in the same package can access the feature. This is the default access control if none is specified.  
   D. Access is permitted by methods of the same class, subclasses, and classes in the same package.  
   E. None of these

4. Specify the accessibility provided by *package*:

   A. Accessible from anywhere  
   B. Accessible from just within its own class  
   C. All methods of classes in the same package can access the feature. This is the default access control if none is specified.  
   D. Access is permitted by methods of the same class, subclasses, and classes in the same package.  
   E. None of these

5. Specify the accessibility provided by *private*:

   A. Accessible from anywhere  
   B. Accessible from just within its own class
C. All methods of classes in the same package can access the feature. This is the default access control if none is specified.
D. Access is permitted by methods of the same class, subclasses, and classes in the same package.
E. None of these

6. Specify the accessibility provided *protected*:
   A. Accessible from anywhere
   B. Accessible from just within its own class
   C. All methods of classes in the same package can access the feature. This is the default access control if none is specified.
   D. Access is permitted by methods of the same class, subclasses, and classes in the same package.
   E. None of these
MULTIPLE CHOICE

1. ANS: B
   ...The parenthesis around \( x/y \) creates a little “world of its own” and since \( x \) and \( y \) are both integers, integer arithmetic is done giving 2 (not 2.33333333333333). This answer is then cast into a \textit{double}.
   
   PTS: 1

2. ANS: C
   ...\textit{Only} the \( x \) is cast as a \textit{double}. \( x/y \) is now done with \textit{double} arithmetic since \( x \) is a \textit{double}.
   
   PTS: 1

3. ANS: A
   PTS: 1

4. ANS: C
   PTS: 1

5. ANS: B
   PTS: 1

6. ANS: D
   PTS: 1
Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. What is the Big O value for the following code?

   ```java
   for (int j = 5; j < p; j = j + 10)
   {
     for(int k = 3; k < q; k = k * 5)
     {
       ...
     }
   }
   ```

   A. $O(1)$           D. $O(p \log q)$
   B. $O(pq)$          E. $O(p^q)$
   C. $O(q \log p)$

2. What is printed by `System.out.println(10 / 4 * 50);`?

   A. .05           D. 100
   B. 125          E. None of these
   C. 125.0

3. Suppose we have a `Mechanical` class and we want to make an array of 200 objects from this class. What code will do this?

   A. `Mechanical obj[] = new Mechanical[200];`
   B. `Mechanical obj[] = Mechanical[200];`
   C. `Mechanical obj = new Mechanical[200];`
   D. `Mechanical obj[] = new Mechanical(200);`
   E. None of these

4. Is it possible to initialize all 200 objects at the same time they are instantiated as in the following?

   ```java
   Mechanical obj[] = new Mechanical[200];
   ```

   A. Yes
   B. No
   C. It depends on the contents of `Mechanical`

5. Assuming the constructor for `Mechanical` is `public Mechanical(int x)` what code initializes the object with index 36 and pass an `int` value of 5.

   A. `obj = new Mechanical(5, 36);`           D. `obj[36] = new Mechanical(5);`
   B. `obj[5] = new Mechanical(36);`          E. None of these
   C. `obj[36] = Mechanical(5);`
Nugget 13 Quiz
Answer Section

MULTIPLE CHOICE

1.  ANS: D  PTS: 1
2.  ANS: D  PTS: 1
3.  ANS: A  PTS: 1
4.  ANS: B  PTS: 1
5.  ANS: D  PTS: 1
Nugget 14 ...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

Integer i = new Integer(49);  //Java 5.0, Integer i = 49;
Integer j = new Integer(49);  //Java 5.0, Integer j = 49;
Integer k = j;
Double m = new Double(49);  //Java 5.0, Double m = 49;

____ 1. What is printed by `System.out.println(i.equals(m));`
(Refer to the code above.)

A. true  
B. false

____ 2. What is printed by `System.out.println(i.equals(j));`
(Refer to the code above.)

A. true  
B. false

____ 3. What is printed by `System.out.println(i == j);`
(Refer to the code above.)

A. true  
B. false

____ 4. What is printed by `System.out.println(k == j);`
(Refer to the code above.)

A. true  
B. false

____ 5. What is printed by `System.out.println( Integer.toHexString(0x3C7 ^ 0xA2B) );`

A. 9EC  
B. CE9  
C. 9C  
D. 9E  
E. None of these
MULTIPLE CHOICE

1. ANS: B   PTS: 1
2. ANS: A   PTS: 1
3. ANS: B
   ... they are different objects
   PTS: 1
4. ANS: A
   ... they are the same object
   PTS: 1
5. ANS: A
   $0x3C7 = \begin{array}{c}
   0011 \\
   1100 \\
   0111
   \end{array}$
   $0xA2B = \begin{array}{c}
   1010 \\
   0010 \\
   1011
   \end{array}$
   $\hline
   1001 \\
   1110 \\
   1100
   \hline
   9 \\
   E \\
   C
   = \text{9EC, the answer}
   PTS: 1
Nugget 15 ... Quiz

Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. What code will convert \textit{double} \textit{d} to a \textit{String} and store the result in \textit{s}.

A. \texttt{String s = String.valueOf(d);} 
B. \texttt{String s = \texttt{d} + \texttt{""};}
C. \texttt{String s = \texttt{""} + \texttt{d};}

2. Suppose you wish to create a \textit{Hospital} class that has a version of all the methods listed in the \textit{Accounting} interface. Furthermore, the \textit{Hospital} class must have access to all public methods and state variables of the \textit{HealthCare} class. Which class signature for \textit{Hospital} will accomplish all this?

A. public class Hospital implements HealthCare extends Accounting
B. public class Hospital extends HealthCare implements Accounting
C. public class Hospital extends HealthCare, Accounting
D. public class Hospital implements HealthCare, Accounting
E. None of these

3. What does the following print?

\begin{verbatim}
double p = 3.07;
double q = 2.9;
int count = 2;
if ((p / q == 1) && (count-- < 59))
{
    ... 
}
System.out.println(count);
\end{verbatim}

A. 1 
B. 2 
C. 3 
D. 0 
E. None of these

4. What does the following print?

\begin{verbatim}
double p = 3.07;
double q = 2.9;
int count = 2;
if ((p / q == 1) || (count-- < 59))
{
    ... 
}
System.out.println(count);
\end{verbatim}

A. 1 
B. 2 
C. 3 
D. 0 
E. None of these

5. What does the following print?

\begin{verbatim}
double p = 3.07;
double q = 3.07;
\end{verbatim}
int count = 2;
if ((p / q == 1) & (count-- < 59))
{
   ...
}
System.out.println(count);

A.  1  D.  Illegal, won’t compile
B.  2  E.  None of these
C.  3
Nugget 15 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: E  
   PTS: 1

2. ANS: B  
   PTS: 1

3. ANS: B  
   PTS: 1

4. ANS: A  
   PTS: 1

5. ANS: A  
   PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Suppose we want the method specified by the following signature to be static.

   public Boolean theMethod(int x, double d)

   Insert the word static into its proper place in the method signature.

   A. public static Boolean theMethod(int x, double d)
   B. static public Boolean theMethod(int x, double d)
   C. public Boolean static theMethod(int x, double d)
   D. public static Boolean theMethod static(int x, double d)
   E. None of these

2. What is printed by the following?

   String s = “Reverberate”;
s = s. replace(‘r’, ‘A’);
System.out.println(s);

   A. ReveAbeAate
   B. AeveAbeAate
   C. Reverberrte
   D. None of these

3. Which code uses an enhanced for loop to calculate and print the product of the square roots of each element in array q (assume q is an array of type double).

   A. double product = 1.0;
   for(double d: q)
       product *= Math.sqrt(q);
   System.out.println(product);
   B. double product = 1.0;
   for(double q: d)
       product *= Math.sqrt(d);
   System.out.println(product);
   C. double product = 1.0;
   for(double d: q)
       product *= Math.sqrt(d);
   System.out.println(product);
   D. double product = 1.0;
   for(d: q)
       product *= Math.sqrt(d);
   System.out.println(product);
   E. None of these

4. What is printed by the following?

   char ch[] = {‘a’, ‘b’, ‘c’, ‘d’};
   for(char c: ch)
       c = ‘x’;
   for(char myChar: ch)
System.out.println(myChar);

A. Illegal, won’t compile

D. d
c  
b  
a

B. a
d

E. None of these

C. abcd

5. Suppose you have a class called MyClass and that it has a main method whose signature is:

public static void main(String []args)

Now suppose that the following command is issued from a DOS prompt (you may assume that both MyClass.class and java.exe both reside in the current directory):

java MyClass Hello good buddy

Without assuming prior knowledge of what these three command line parameters are, what single line of code would reside in main and would print the following:

Hello good buddy

A. System.out.println(args(0,2));
B. System.out.println(args1 + " " + args2 + " " +args2);
C. System.out.println(args);
D. System.out.println(args[0] + " " + args[1] + " " +args[2]);
E. None of these
### MULTIPLE CHOICE

1. ANS: A  PTS:  1  
2. ANS: A  PTS:  1  
3. ANS: C  PTS:  1  
4. ANS: B  PTS:  1  
5. ANS: D  PTS:  1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Suppose you wish to find the index of the first occurrence of the character ‘A’ (starting with index 4) in String myString. Which line of code will store this value in the integer \( k \).
   
   A. \( \text{int } k = \text{myString.indexOf}(65, 4); \)
   B. \( \text{int } k = \text{myString.indexOf}(\text{‘A’}, 4); \)
   C. \( \text{int } k = \text{myString.lastIndexOf}(65); \)
   D. \( \text{int } k = \text{myString.charAt}(65, 4); \)
   E. More than one of these

2. Which line of code will find the first occurrence of “ee” in the sentence stored in String sentc. Store the index in \( jj \).

   A. \( \text{int } jj = \text{sentc.indexOf}(\text{ascii}(69), 2); \)
   B. \( \text{int } jj = \text{sentc.indexOf}(69,69); \)
   C. \( \text{int } jj = \text{sentc.indexOf}(\text{“ee”}); \)
   D. \( \text{int } jj = \text{sentc.index(“ee”);} \)
   E. More than one of these

3. What is output by the following code?

   ```java
   int [] x, y;
   x = {20, 30, 40, 50, 60};
   y = x;
   for (int j =0; j < y.length; j++)
   { 
       y[j] = y[j] + 1;
   }
   for (int j =0; j < x.length; j++)
   { 
       System.out.print(x[j] + "   ");
   }
   ```

   A. 20 30 40 50 60
   B. 30 40 50 60 70
   C. 21 31 41 51 61
   D. 61 51 41 31 21
   E. None of these

4. What is output when the `flay` method is called?

   ```java
   public boolean flay(double [] peewee)
   {
       peewee = null;
       int pf = peewee[7];
       System.out.println(pf);
   }
   ```

   A. Illegal, won’t compile
   B. Not enough information
   C. Exception at run time
   D. None of these
5. Suppose in a method you are writing, you have a very large String array, and at some point in the code you are finished with it and would like to recover the very large amount of memory it was occupying. If the array’s name is susie, how would you do this?

A. Arrays.null(susie);
B. susie = null;
C. susie.null();  

6. List the precedence (from highest to lowest) for the following boolean operators:

&  |  ||  ^  &&

A. &&  &  ||  |  ^  D. &  ^  |  &&  ||
B. &  &&  ^  ||  E. None of these
C. ||  |  &&  &  ^

7. What does (false ^ true & true) yield?

A. true  B. false

8. What does (false && true | true) yield?

A. true  B. false
MULTIPLE CHOICE

1. ANS: E
   ... both A and B
   PTS: 1
2. ANS: C   PTS: 1
3. ANS: C   PTS: 1
4. ANS: C
   "nt pf = peewee[7];" will throw a NullPointerException
   PTS: 1
5. ANS: B   PTS: 1
6. ANS: D   PTS: 1
7. ANS: A   PTS: 1
8. ANS: B   PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What is another name for “method”?
   A. function
   B. subroutine
   C. signature
   D. header
   E. More than one of these

2. What is another name for “header”?
   A. function
   B. subroutine
   C. signature
   D. method
   E. More than one of these

3. What is another name for “function”?
   A. method
   B. subroutine
   C. signature
   D. header
   E. More than one of these

4. What is another name for “signature”?
   A. function
   B. subroutine
   C. method
   D. header
   E. More than one of these

Suppose we have two classes, Colors and Green. Colors implements the ColorStuff interface. Green is a subclass of Colors. Both have an implementation of the getValue method (which is not in the ColorStuff interface) as follows:

```java
public double getValue(int x) //Version in Colors
{   return 123.04; }
```

```java
public double getValue(int x) //Version in Green...this version overrides
{   return 19; }    // the other
```

Consider the following code in another class:

```java
Colors myColor = new Green();
double d = myColor.getValue(3);
System.out.println(d);
```

5. What is printed by the above code?
   A. 19
   B. 19.0
   C. 123.04
   D. Illegal, won’t compile
   E. None of these

6. What does myColor instanceof Green return? (Refer to the code above.)
7. What does `myColor instanceof Colors` return? (Refer to the code above.)
   A. `true`  
   B. `false`

8. What does `myColor instanceof ColorStuff` return? (Refer to the code above.)
   A. `true`  
   B. `false`

9. Is `Colors obj = new ColorStuff();` legal?
   A. Yes  
   B. No

10. If `ob` is created with `ColorStuff ob = new Colors();`, is `ob.getValue();` legal?
    A. Yes  
    B. No

11. What is printed by the following code? (Assume `Stack st` already exists.)
    ```java
    st.push("LA");
st.push("Houston");
String s1 = (String)st.peek();
st.push("Chicago");
String s2 = (String)st.pop();
st.push("Boston");
System.out.println(s1 + st + s2);
    ```
    A. Houston[LA, Houston, Boston]Chicago  
    B. Chicago[LA, Houston, Boston]Houston  
    C. Houston[Boston, Houston, LA]Chicago  
    D. HoustonChicago[LA, Houston, Boston]  
    E. None of these

12. What method of the `Stack st` class is invoked with the following?
    ```java
    System.out.println(st);
    ```
    A. `printStack`  
    B. `toString`  
    C. `hashCode`  
    D. `getStack`  
    E. None of these
MULTIPLE CHOICE

1. ANS: E
   ... both A and B
   PTS: 1

2. ANS: C
   PTS: 1

3. ANS: E
   ... both A and B
   PTS: 1

4. ANS: D   PTS: 1

5. ANS: B   PTS: 1

6. ANS: A   PTS: 1

7. ANS: A   PTS: 1

8. ANS: A   PTS: 1

9. ANS: B
   ...No, *ColorStuff* has no code.
   PTS: 1

10. ANS: B
    ...No, *ob* is a *ColorStuff* object and we can only use methods listed in *ColorStuff*.
    PTS: 1

11. ANS: A   PTS: 1

12. ANS: B   PTS: 1
Nugget 19 ... Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

```java
public class Elvis {
    public Elvis( )
    {
        <#1>
    }
    public Elvis(String s, double d)
    {
        ...
    }
    public Elvis(char ch)
    {
        ...
    }
    ... remaining code not shown...
}
```

1. Which of the constructors is the default constructor? (Refer to the code above.)
   A. public Elvis( )
   B. public Elvis(String s, double d)
   C. public Elvis(char ch)
   D. None of these

2. What code should replace <#1> in order that the two-parameter constructor be called? Pass a `double` value of 3.14159 and a `String` value of “Humpback Whale”. (Refer to the code above.)
   A. this(3.14159, “Humpback Whale”);
   B. super(“Humpback Whale”, 3.14159);
   C. call(“Humpback Whale”, 3.14159);
   D. this(“Humpback Whale”, 3.14159);
   E. None of these

3. What code should replace <#1> in order that the one-parameter constructor be called? Pass a `char` value that is the first letter of Elvis’ last name. (Refer to the code above.)
   A. call(‘P’);
   B. this(‘P’);
   C. super(‘P’)
   D. this(“C”);
   E. More than one of these
Lesson 19...Quiz
Answer Section

**MULTIPLE CHOICE**

1. ANS: A  PTS: 1
2. ANS: D  PTS: 1
3. ANS: B  PTS: 1
Nugget 20 ...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

```java
class Calculus {
    {
        upperLimit = 11;
    }
    public Calculus( )  //constructor
    {
        upperLimit--;
        lowerLimit++;
    }
    ... Methods and other state variables...
    public int upperLimit;
    public static int lowerLimit;
}
```

1. What is output by the following?
```
Calculus calc1 = new Calculus( );
System.out.println( calc1. upperLimit + "     " + calc1. lowerLimit);
```

A. 11 75  
B. 76 10  
C. 10 76  
D. 10 77  
E. None of these

2. What is output by the following?
```
Calculus calc1 = new Calculus( );
Calculus calc2 = new Calculus( );
System.out.println( calc2. upperLimit + "     " + calc2. lowerLimit);
```

A. 11 75  
B. 76 10  
C. 10 76  
D. 10 77  
E. None of these
MULTIPLE CHOICE

1. ANS: C       PTS: 1
2. ANS: D       PTS: 1
Nugget 21 ...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

```
public class DopplerShift
{
    public DopplerShift()
    {
        System.out.println(dd);
        ...
    }
    ...
    other methods and state variables

    public double dd;
}

public class Tester
{
    public static void main(String args[])
    {
        DopplerShift ds = new DopplerShift();
        System.out.println(ds.dd);

        int bg;
        System.out.println(bg);
    }
}

---

1. What does `System.out.println(dd);` in the code above print (assuming the remainder of the code would compile)?

   A. 0.0   D. This line will not compile
   B. 1      E. None of these
   C. null

2. What does `System.out.println(ds.dd);` in the code above print (assuming the remainder of the code would compile)?

   A. 0.0   D. This line will not compile
   B. 1      E. None of these
   C. null

3. What does `System.out.println(bg);` in the code above print (assuming the remainder of the code would compile)?

   A. 0.0   D. This line will not compile
   B. 1      E. None of these
   C. null
4. To what is a numeric array element automatically initialized (in the absence of specific initialization)?

A. 0 or 0.0  
B. 1  
C. null  
D. Nothing, not initialized  
E. None of these

5. To what is a numeric data member automatically initialized (in the absence of specific initialization)?

A. 0 or 0.0  
B. 1  
C. null  
D. Nothing, not initialized  
E. None of these

6. To what is a String state variable automatically initialized (in the absence of specific initialization)?

A. A single space  
B. "" (zero length String)  
C. null  
D. Nothing, not initialized  
E. None of these

7. To what is a local numeric variable automatically initialized (in the absence of specific initialization)?

A. 0 or 0.0  
B. 1  
C. null  
D. Nothing, not initialized  
E. None of these
MULTIPLE CHOICE

1. ANS: A   PTS: 1
2. ANS: A   PTS: 1
3. ANS: D   PTS: 1
4. ANS: A   PTS: 1
5. ANS: A   PTS: 1
6. ANS: B   PTS: 1
7. ANS: D   PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. An object, obj, has Object type objects stored in it. Which of the following would be the prototype of the `compet()` method such that `obj.compet()` would return a singly dimensioned array of Object type objects:

A. Object compet(1);
B. Object [] compet( );
C. (Object) [] compet( );
D. Object [1] compet( );
E. None of these

____ 2. When Boolean OR-ing two boolean expressions, when is only one expression evaluated?

A. When the left expression is true
B. When the right expression is true
C. When the left expression is false
D. When the right expression is false

____ 3. When Boolean AND-ing two boolean expressions, when is only one expression evaluated?

A. When the left expression is true
B. When the right expression is true
C. When the left expression is false
D. When the right expression is false

____ 4. In order to determine if the character at index `j` of String `sp` is a whitespace character, which of the following would return the appropriate boolean?

A. Character.sp.isWhitespace(j)
B. sp.charAt(j).isWhitespace
C. Character.isWhitespace(sp.charAt(j))
D. sp.charAt(isWhitespace())
E. None of these
MULTIPLE CHOICE

1. ANS: B  PTS: 1
2. ANS: A  PTS: 1
3. ANS: C  PTS: 1
4. ANS: C  PTS: 1
Nugget 23 Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. If \( c \) is of type `char` and \( i \) is of type `int`, is the following legal or illegal?
   \[ i = c; \]
   A. Legal  
   B. Illegal

___ 2. If \( c \) is of type `char` and \( i \) is of type `int`, is the following legal or illegal?
   \[ c = (\text{char})i; \]
   A. Legal  
   B. Illegal

___ 3. If \( c \) is of type `char` and \( i \) is of type `int`, is the following legal or illegal?
   \[ c = i; \]
   A. Legal  
   B. Illegal

___ 4. What is the range of ASCII codes for the following?
   The digits 0,1 - 9
   A. 48 - 57  
   B. 49 - 58  
   C. 65 - 74  
   D. 97 - 106  
   E. None of these

___ 5. What is the range of ASCII codes for the following?
   The letters a – z
   A. 48 - 73  
   B. 49 - 58  
   C. 65 - 90  
   D. 97 - 122  
   E. None of these

___ 6. What is the range of ASCII codes for the following?
   The letters A – Z
   A. 48 - 73  
   B. 49 - 58  
   C. 65 - 90  
   D. 97 - 122  
   E. None of these

___ 7. If `repository` is an object that stores `String` objects that are ultimately stored as `Object` type objects, and `getStuff` is a method that returns `Object` type objects, which of the following correctly returns the second character of the returned `String`.
   A. `((\text{String})\text{repository}.getStuff( )).charAt(1)`
B. ((String)repository.getStuff()).charAt(2)
C. (String)repository.getStuff().charAt(1)
D. (String)repository.getStuff( ) [1]
E. None of these

8. What is the meaning of XOR and what is its operator symbol?

A. Boolean exclusive-or ...^    D. Bitwise exclusive-or ...^ 
B. Bitwise or ...|                E. None of these
C. Bitwise exclusive-or ...~

Multiple Response
Identify one or more choices that best complete the statement or answer the question.

9. If widget is an object that stores wrapper class Integers that are ultimately stored as Object type objects, and getStuff is a method that returns Object type objects, which one(s) of the following correctly stores Integer j?

A. Integer j = Integer.widget.getStuff( );
B. Integer j = (Integer)(widget.getStuff( ));
C. Integer j = widget.getStuff( );
D. Integer j = (Integer)widget.getStuff( );
E. None of these
Nugget 23 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: A    PTS: 1
2. ANS: A    PTS: 1
3. ANS: B    PTS: 1
4. ANS: A    PTS: 1
5. ANS: D    PTS: 1
6. ANS: C    PTS: 1
7. ANS: A    PTS: 1
8. ANS: D    PTS: 1

MULTIPLE RESPONSE

9. ANS: B, D PTS: 1
Nugget 24 ...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

___ 1. Simplify \( !c + c \cdot b \) where multiplication represents AND-ing and addition represents OR-ing.
   
   A. \( c + b \)   
   B. \( !c + b \)   
   C. \( c + !b \)
   D. \( c \cdot b \)   
   E. None of these

___ 2. Simplify \( a + (a \cdot b) \) where multiplication represents AND-ing and addition represents OR-ing.
   
   A. \( a \)   
   B. \( b \)   
   C. \( a + b \)
   D. \( a \cdot b \)   
   E. None of these

___ 3. Simplify \( !k + (!k \cdot !h) \) where multiplication represents AND-ing and addition represents OR-ing.
   
   A. \( k \)   
   B. \( !k \)   
   C. \( h \)
   D. \( !h \)   
   E. None of these

___ 4. Simplify \( a \cdot (a + b) \) where multiplication represents AND-ing and addition represents OR-ing.
   
   A. \( a + b \)   
   B. \( a \cdot b \)   
   C. \( a \)
   D. \( !b \)   
   E. None of these

___ 5. Show how to create the following two-dimensional array and then use nested loops to print the array in the same format as presented here.

\[
\begin{array}{cccc}
4 & 19 & -3 & 11 \\
22 & 1 & 7 & 143
\end{array}
\]

   A. \( \text{int ary[][]} = \{\{4, 22\}, \{19, 1\}, \{-3, 7\}, \{11, 143\}\}; \)
   
   \{for(int row = 0; row < ary.length; row++)\}
   \{\for(int col = 0; col < ary[row].length; col++)\}
   \{System.out.print(ary[row][col] + " "); \}
   \}System.out.println("");

   B. \( \text{int ary[][]} = \{\{4, 19, -3, 11\}, \{22, 1, 7, 143\}\}; \)
   
   \{for(int row = 0; row < ary.length; row++)\}
   \{}
for(int col = 0; col < ary[row].length; col++)
    {
        System.out.print(ary[row][col] + "     ");
    }
System.out.println("\n");
    
    C.  int ary[][] = {{4, 19, -3, 11},
        {22, 1, 7, 143}};
        for(int row = 0; row < ary.length(); row++)
        {
            for(int col = 0; col < ary[row].length(); col++)
            {
                System.out.print(ary[col][row] + "     ");
            }
        }
    D.  None of these
Nugget 24 ... Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B    PTS: 1
2. ANS: A    PTS: 1
3. ANS: B    PTS: 1
4. ANS: C    PTS: 1
5. ANS: B    PTS: 1
Nugget 25 ...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

_____ 1. Write code that will generate 86 random floating point numbers in the range \(104.5 \leq d < 582.89\). Assume that Random \(\text{rndm}\) already exists.

A. for(int \(j = 104.5; j \leq 582.89; j++\)  
   System.out.println( 86 * \(\text{rndm}.\text{nextDouble}( )\) );

B. for(int \(j = 0; j \leq 86; j++\))  
   System.out.println( 104.5 + 478.39 * \(\text{rndm}.\text{nextDouble}( )\) );

C. for(int \(j = 0; j < 86; j++\))  
   System.out.println( 104.5 + 478.39 * \(\text{rndm}.\text{nextDouble}( )\) );

D. for(int \(j = 0; j < 86; j++\)  
   System.out.println( 478.39 + 104.5 * \(\text{rndm}.\text{nextDouble}( )\) );

E. None of these

_____ 2. Write code that will generate 28 random integers numbers in the range \(1002 \leq d < 2830\). Assume that Random \(\text{rndm}\) already exists.

A. for(int \(j = 0; j < 28; j++\))  
   System.out.println( 1002 + \(\text{rndm}.\text{nextInt}(1829)\) );

B. for(int \(j = 0; j <= 28; j++\)  
   System.out.println( 1002 + \(\text{rndm}.\text{nextInt}(1829)\) );

C. for(int \(j = 0; j < 28; j++\))  
   System.out.println( 1829 + \(\text{rndm}.\text{nextInt}(1002)\) );

D. for(int \(j = 1001; j < 2830; j++\)  
   System.out.println(\(\text{rndm}.\text{nextInt}(28)\) );

E. None of these

_____ 3. What is the range of possible values that the following could return?

\(\text{randomObject}.\text{nextInt}( )\)

A. Integer.MIN_VALUE \(\leftrightarrow\) Integer.MAX_VALUE

B. 0 \(\leftrightarrow\) Integer.MAX_VALUE

C. Integer.MIN_VALUE \(\leftrightarrow\) 0

D. Illegal, nextInt must receive a parameter

E. None of these

_____ 4. Which code creates a Random object called \(r\)?
5. Write code that will create an *Iterator* object from *Map mp*. Use it to print the key-value pairs in *mp*. Assume that only *String* objects are stored as the objects in *mp*.

A. Iterator itr = mp.iterator( );
   while( itr.hasNext( ) )
   {
      String key = (String)itr.next( );
      String value = (String)mp.get(key);
      System.out.println("key = " + key + "------> value =" + value );
   }

B. Set keySet = mp.keySet( );
   Iterator itr = keySet.iterator( );
   while( itr.hasNext( ) )
   {
      String key = (String)itr.next( );
      String value = (String)mp.get(key);
      System.out.println("key = " + key + "------> value =" + value );
   }

C. Set keySet = mp.keySet( );
   Iterator itr = keySet.iterator( );
   while( itr.hasNext( ) )
   {
      String key = itr.next( );
      String value = mp.get(key);
      System.out.println("key = " + key + "------> value =" + value );
   }

D. None of these
MULTIPLE CHOICE

1. ANS: C
   ... 478.39 = 582.89 – 104.5
   PTS: 1

2. ANS: A
   ... 1828 = 2830 – 1002
   PTS: 1

3. ANS: A  PTS: 1

4. ANS: C  PTS: 1

5. ANS: B
   Set keySet = mp.keySet();  //produces a Set object of the keys in mp
   Iterator itr = keySet.iterator();  //produces a Iterator for Set keySet
   while( itr.hasNext( ) )  //loop through the objects in the set
   {
      String key = (String)itr.next( );
      String value = (String)mp.get(key);
      System.out.println("key = " + key + "-----> value =" + value );
   }
   PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What is printed by `System.out.println(calc(5));`?

   ```java
   public static int calc(int n)
   {
       if (n < 1)
           return n +20;
       else
           {  
               n = n +1;
               return n + calc(n -2);
           }
   }
   
   A. 40
   B. 22
   C. 21
   D. 23
   E. None of these
   ```

2. What is displayed by `lynx(14);`?

   ```java
   public static void lynx(int n)
   {
       if (n < 3)
           System.out.print(n);
       else
           {  
               lynx(n / 2);
               System.out.print("--" + (n + 1));
           }
   }
   
   A. 2--6--9--14
   B. 15--8--4--1
   C. 14--2--6--9
   D. 1--4--8--15
   E. None of these
   ```

3. What is returned by `dateCalc(4);`?

   ```java
   public static int dateCalc(int n)
   {
       if (n == 0)
           return -2;
       else if (n == 1)
           return 8;
       else
           return 3 * dateCalc(n - 1) + 2 * dateCalc(n - 2);
   }
   
   A. 268
   B. 301
   ```
4. What is printed by the `g(3)`?

```java
public void g(int z)
{
    if(z == 0)
        System.out.print("^^");
    else
        { 
            System.out.print(">|");
            g(z-1);
            System.out.print("<|";
        }
}
```

A. >>>|^<<<<<
B. <|<<<^>|>
C. >>|^<<<<<
D. <|<^>|>
E. None of these
MULTIPLE CHOICE

1. ANS: A
   \[ 4 = (6 + 5 + 4 + 3 + 2 + 20) \]
   PTS: 1

2. ANS: D
   Notice on this method we pass in these values of \( n \).
   \[
   \begin{array}{c}
   14 \\
   7 \\
   3 \\
   1 \\
   \end{array}
   \]
   Nothing is printed until the last time when we are down to a 1. Then we start coming back up the calling
   chain and printing.
   PTS: 1

3. ANS: A
   The way we approach this is to just build the sequence from the rules we see expressed in the code. Term 0
   has a value of -2 and term 1 has a value of 8.

<table>
<thead>
<tr>
<th>Term number</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>-2</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   How will we get term 2? Well, the rule in the code says it’s three times the previous term plus twice the term
   before that. That gives us \( 3 \times 8 + 2 \times (-2) = 22 \). Continue this to obtain the other terms.

<table>
<thead>
<tr>
<th>Term number</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>-2</td>
<td>8</td>
<td>20</td>
<td>76</td>
<td>268</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   PTS: 1

4. ANS: C
   Let’s begin analyzing this by observing the output of \( g(0) \). It simply prints an “^”.

<table>
<thead>
<tr>
<th>Term number</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>^</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   Now, what about \( g(1) \)? It first prints a “>|” followed by \( g(z-1) \). But \( g(z-1) \) is simply the previous term, and we
   already know that it’s an “^”. A “|<” follows. So our 2\textsuperscript{nd} term is “>|^|<”.

<table>
<thead>
<tr>
<th>Term number</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>^</td>
<td>&gt;</td>
<td></td>
<td>^</td>
<td></td>
</tr>
</tbody>
</table>

   Similarly, each subsequent term is the previous term sandwiched in between “>|” and “|<” and so we have:

<table>
<thead>
<tr>
<th>Term number</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>^</td>
<td>&gt;</td>
<td></td>
<td>^</td>
<td></td>
</tr>
</tbody>
</table>

   So, if we are asked for \( g(3) \) the answer is >|>|^|<|<|<|<|<|<.
   PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. What is the smallest (fastest) Big O value for an Insertion Sort?
   A. O(n)  
   B. O(n^2)  
   C. O(log n)  
   D. O(n log n)  
   E. None of these

2. What is the Big O value for the following code in terms of n?
   ```java
   for(int j = 0; j < 3 * n; j++)
   {
       for(k = 0; k < n +1; k*=3)
       {
           …some code…
       }
   }
   ```
   A. O(n)  
   B. O(n^2)  
   C. O(log n)  
   D. O(n log n)  
   E. None of these

3. What is the largest (slowest) Big O value for an Quick Sort?
   A. O(n)  
   B. O(n^2)  
   C. O(log n)  
   D. O(n log n)  
   E. None of these

4. What is the Big O value for the following code?
   ```java
   for(int j = 0; j < n; j+=10)
   {
       for(k = 0; k < n +1; k++)
       {
           …some code…
       }
   }
   ```
   A. O(n)  
   B. O(n^2)  
   C. O(log n)  
   D. O(n log n)  
   E. None of these

5. What is returned by Math.ceil(-1032.13) ?
   A. -1032.0  
   B. -1033.0  
   C. -1032  
   D. -1033  
   E. None of these

6. What is returned by Math.floor(150.788) ?
   A. 150.8  
   B. 150.7  
   C. None of these  
   D. 150.78  
   E. None of these
7. What is returned by `Math.round(7/2)`?

A. 4  
B. 3.5  
C. 3.0

D. 3  
E. None of these
Nugget 27 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: A   PTS:  1
2. ANS: D   PTS:  1
3. ANS: B   PTS:  1
4. ANS: B   PTS:  1
5. ANS: A   PTS:  1
6. ANS: E   PTS:  1
    ... answer is 150.0
7. ANS: C   PTS:  1
    …7/2 is integer arithmetic and gives 3.0. After rounding, it’s still 3.0
Nugget 28 Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. For `sa = s.split("\|w")`; list the contents of each resulting array element.
   
   ```java
   String s = “Mr. Kowabunga”;
   String[] sa;
   ```

   D. Illegal split syntax
   E. None of these

2. For `sa = s.split(“ow”);` list the contents of each resulting array element.
   
   ```java
   String s = “Mr. Kowabunga”;
   String[] sa;
   ```

   B. `sa[0] = “ow”`
   D. Illegal split syntax
   E. None of these

3. For `sa = s.split(“\\[ow\\]”);` list the contents of each resulting array element.
   
   ```java
   String s = “Mr. Kowabunga”;
   String[] sa;
   ```

   D. Illegal split syntax
   E. None of these

4. For `g = str.split(“s”);` list the contents of each resulting array element.
   
   ```java
   String str = “Xray   Vision”; //three spaces between ‘y’ and ‘V’
   String[] g;
   ```

   B. `g[0] = “Xray”, g[1] = “Vision”`
   D. Illegal split syntax
   E. None of these

5. For `g = str.split(“s+”);` list the contents of each resulting array element.
String str = “Xray   Vision”; //three spaces between ‘y’ and ‘V’
String [] g;

B. g[0] = “Xray”, g[1] = “Vision”
D. Illegal split syntax
E. None of these

6. Using the following code, determine the contents of each element of the sp array:

String s = "790JW7423WdV is my password";
String sp[] = s.split("\d*J|[0-6]+");

C. sp[0] = “W7”, “WdV is my password”
D. Illegal split syntax
E. None of these
Nugget 28 Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: B       PTS: 1
2. ANS: A       PTS: 1
3. ANS: A       PTS: 1
4. ANS: C       PTS: 1
5. ANS: B       PTS: 1
6. ANS: B       PTS: 1
Nugget 29 ...Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Which type of exception must be handled?
   A. checked  
   B. unchecked  
   C. masked  
   D. unmasked  
   E. None of these

2. Consider that we have try, catch, and finally blocks. Will the code in the finally block always run?
   A. Yes  
   B. No

3. What is the meaning of final as applied to a class?
   A. final can’t be applied to a class  
   B. Class can’t be inherited.  
   C. Methods can’t be overridden in an inheriting class.  
   D. Further modification of the class is prohibited.  
   E. This class can’t inherit another class.  
   F. Can’t have objects instantiated from it.  
   G. Class has no code.

4. What is the meaning of final as applied to a method?
   A. final can’t be applied to a method.  
   B. Class in which the method resides can’t be inherited.  
   C. Method can’t be overridden.  
   D. Further modification of the class in which the method resides is prohibited.  
   E. Class in which the method resides can’t inherit another class.  
   F. Class in which the method resides can’t have objects instantiated from it.  
   G. Method has no code.

5. What is the meaning of abstract as applied to a class?
   A. abstract can’t be applied to a class.  
   B. Class can’t be inherited.  
   C. Methods can’t be overridden in an inheriting class.  
   D. Further modification of the class is prohibited.  
   E. This class can’t inherit another class.  
   F. Can’t have objects instantiated from it.  
   G. Class has absolutely no code.

6. What is the meaning of abstract as applied to a method?
   A. abstract can’t be applied to a method.  
   B. Its class can’t be inherited.  
   C. Method can’t be overridden in an inheriting class.  
   D. Further modification of the method is prohibited.
E. Its class can’t inherit another class.
F. Forces an inheriting class to implement code for the method.
G. Method uses abstract concepts of mathematics.

Multiple Response
Identify one or more choices that best complete the statement or answer the question.

7. What are the methods of the **Iterator** interface?

A. `hasNext`  
B. `nextIndex`  
C. `next`  
D. `hasPrevious`  
E. `remove`  
F. `add`  
G. `set`  
H. `previousIndex`

8. What are the permissible ways to handle checked exceptions?

A. Append `throws <ExceptionClassName>` to the class signature  
B. Append `throws <ExceptionClassName>` to the method signature  
C. Ignore the possibility of an exception  
D. Use `try` and `catch` blocks (and optionally `finally`)  
E. Trap the error with a `switch` statement
Nugget 29 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: A  PTS: 1
2. ANS: A  PTS: 1
3. ANS: B  PTS: 1
4. ANS: C  PTS: 1
5. ANS: F  PTS: 1
6. ANS: F  PTS: 1

MULTIPLE RESPONSE

7. ANS: A, C, E  PTS: 1
8. ANS: B, D  PTS: 1
Multiple Choice
Identify the choice that best completes the statement or answers the question.

public class Shape
{
    public Shape(int ns)
    {
        numSides = ns;
        polygonNum++;
    }

    …other methods not shown…

    public static String enumPolygonTypes( )
    {…code not shown…}

    public int numSides;
    public static polygonNum = 0;
}

1. From within some other class, show how to print the enumeration of polygon types without using an object of the Shape class. (Refer to the code above.)

A. System.out.println( Shape.enumPolygonTypes( ) );
B. System.out.println( Static.enumPolygonTypes( ) );
C. System.out.println( Object.enumPolygonTypes( ) );
D. System.out.println( (Shape)enumPolygonTypes( ) );
E. None of these

2. What will the following code print? (Refer to the code above.)

Shape p18 = new Shape(3);
Shape p37 = new Shape(5);
System.out.print(Shape.polygonNum++);
System.out.println(p18.polygonNum);

A. 23          D. 3
   2
B. 2            E. None of these
   3
C. 32

3. What will the following code print? (Refer to the code above.)

List myList = new ArrayList( );
myList.add(new Shape(3));
myList.add(new Shape(5));
myList.add(new Shape(11));
ListIterator lstIter = myList.listIterator();
Object ob = lstIter.next();
if(lstIter.hasNext( )
{
    ob = lstIter.next();
}
System.out.println( ((Shape)ob).numSides );

A. 3  
B. 5  
C. 11  
D. Illegal, won’t compile  
E. None of these

4. What will print a version of double d that rounds off to the 5th decimal place and will always show at least 3 decimal places.

A. NumberFormat fmt = NumberFormat.getNumberInstance( );
   fmt.setMaximumFractionDigits(5);
   fmt.setMinimumFractionDigits(3);
   System.out.println( fmt.format(d) );

B. NumberFormat fmt = NumberFormat.getNumberInstance( );
   fmt.setMaximumFractionDigits(3);
   fmt.setMinimumFractionDigits(5);
   System.out.println( fmt.format(d) );

C. NumberFormat fmt = new NumberFormat( );
   fmt.setMaximumFractionDigits(5);
   fmt.setMinimumFractionDigits(3);
   System.out.println( fmt.format(d) );

D. NumberFormat fmt = NumberFormat.getNumberInstance( );
   fmt.setMaximumFractionDigits(5);
   fmt.setMinimumFractionDigits(3);
   System.out.println( fmt.format(d) );

E. None of these
Nugget 30 ...Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: A    PTS: 1
2. ANS: A    PTS: 1
3. ANS: B    PTS: 1
4. ANS: D    PTS: 1