High Level Programming Language Java(1) Questions Bank   Name__________   Java No_______

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

1) Suppose a Scanner object is created as follows:

Scanner input = new Scanner(System.in);

What method do you use to read a real number?

A) input.double();   B) input.Double();
C) input.nextDouble(); D) input.nextdouble();

Section: 2.3 Reading Input from the Console

2) Which of the following are correct ways to declare variables?

A) int length, width;   B) int length; int width;
C) int length, int width; D) int length; width;

Section: 2.5 Variables

3) To declare a constant MAX_LENGTH inside a method with value 99.98, you write ________.

A) final float MAX_LENGTH = 99.98;   B) double MAX_LENGTH = 99.98;
C) final double MAX_LENGTH = 99.98; D) final MAX_LENGTH = 99.98;

Section: 2.7 Named Constants

4) The expression 4 + 20 / (3 - 1) * 2 is evaluated to ________.

A) 25   B) 20   C) 4   D) 9   E) 24

Section: 2.11 Evaluating Expressions and Operator Precedence

5) To obtain the current hour in UTC, use ________.

A) System.currentTimeMillis() / 1000 / 60 / 60 % 24
B) System.currentTimeMillis() / 1000 % 60
C) System.currentTimeMillis() % 3600
D) System.currentTimeMillis() / 1000 / 60 % 60
E) System.currentTimeMillis() % 60

Section: 2.12 Case Study: Displaying the Current Time

6) What is x after the following statements?

int x = 1;
x *= x + 1;

A) x is 1.   B) x is 2.   C) x is 3.   D) x is 4.

Section: 2.13 Augmented Assignment Operators

7) Which of the following expressions results in 45.37?

A) (int)(45.378 * 100 / 100)   B) (int)(45.378) * 100 / 100.0
C) (int)(45.378 * 100) / 100   D) (int)(45.378 * 100) / 100.0

Section: 2.15 Numeric Type Conversions

8) Analyze the following code:

```
public class Test {
  public static void main(String[] args) {
    int n = 10000 * 10000 * 10000;
    System.out.println("n is " + n);
  }
}
```

A) The result of 10000 * 10000 * 10000 is too large to be stored in an int variable n. This causes an underflow and the program is aborted.
B) The result of 10000 * 10000 * 10000 is too large to be stored in an int variable n. This causes an overflow and the program is aborted.
C) The result of 10000 * 10000 * 10000 is too large to be stored in an int variable n. This causes an overflow and the program continues to execute because Java does not report errors on overflow.
D) The program displays n is 1000000000000.
E) The result of 10000 * 10000 * 10000 is too large to be stored in an int variable n. This causes an underflow and the program continues to execute because Java does not report errors on underflow.
Section: 2.18 Common Errors and Pitfalls

9) In Java, the word true is ________.
A) same as value 1   B) same as value 0   C) a Java keyword   D) a Boolean literal
Section: 3.2 Boolean Data Type

10) Suppose income is 4001, what is the output of the following code?

```
if (income &gt; 3000) {
  System.out.println("Income is greater than 3000");
}
else if (income &gt; 4000) {
  System.out.println("Income is greater than 4000");
}
```

A) no output
B) Income is greater than 4000 followed by Income is greater than 3000
C) Income is greater than 3000 followed by Income is greater than 4000
D) Income is greater than 4000
E) Income is greater than 3000
Section: 3.4 Two-Way if-else Statements

11) Analyze the following code:

```
boolean even = false;
if (even = true) {
  System.out.println("It is even");
}
```

A) The program runs fine, but displays nothing. B) The program has a compile error.
C) The program has a runtime error.   D) The program runs fine and displays It is even.
Section: 3.6 Common Errors and Pitfalls

12) Which of the following is a possible output from invoking Math.random()?
A) 0.0 B) 0.5 C) 3.43 D) 1.0
Section: 3.7 Generating Random Numbers

13) Given |x - 2| &lt;= 4, which of the following is true?
A) x - 2 &lt;= 4 | | x - 2 &gt;= -4 B) x - 2 &lt;= 4 && x - 2 &gt; -4
C) x - 2 &lt;= 4 && x - 2 &gt;= -4 D) x - 2 &lt;= 4 && x - 2 &gt;= 4
Section: 3.11 Determining Leap Year

14) Suppose x=10 and y=10. What is x after evaluating the expression (y &gt;= 10) | | (x-- &gt; 10)?
A) 9 B) 10 C) 11
Section: 3.12 Lottery

15) What is y after the following switch statement is executed?

```
int x = 3; int y = 4;
switch (x + 3) {
  case 6: y = 0;
  case 7: y = 1;
  default: y += 1;
}
```

A) 1   B) 2   C) 3   D) 4   E) 0

Section: 3.13 switch Statements

16) What is y after the following statement is executed?

x = 0;

y = (x &gt; 0) ? 10 : -10;

A) -10

B) 20

C) 0

D) 10

E) Illegal expression

Section: 3.14 Conditional Expressions

17) What is y displayed in the following code?

```
public class Test1 {
  public static void main(String[] args) {
    int x = 1;
    int y = x = x + 1;
    System.out.println("y is " + y);
  }
}
```

A) y is 1 because x is assigned to y first.

B) The program has a compile error since x is redeclared in the statement int y = x = x + 1.

C) y is 0.

D) y is 2 because x + 1 is assigned to x and then x is assigned to y.

Section: 3.15 Operator Precedence and Associativity

18) To obtain the arc sine of 0.5, use ________.

A) Math.asin(0.5)   B) Math.sin(Math.toRadians(0.5))

C) Math.asin(Math.toDegrees(0.5))   D) Math.sin(0.5)

Section: 4.2 Common Mathematical Functions

19) Which of the following statements prints smith\exam1\test.txt?

A) System.out.println("smith\exam1\test.txt");   B) System.out.println("smith\"exam1\"test.txt");

C) System.out.println("smith"\exam1"\test.txt");D) System.out.println("smith\\exam1\\test.txt");

Section: 4.3 Character Data Type and Operations

20) Will System.out.println((char)4) display 4?

A) Yes B) No

Section: 4.3 Character Data Type and Operations

21) An int variable can hold ________.

A) 'x'   B) 120   C) "x"   D) "120"E) 120.0

Section: 4.3 Character Data Type and Operations

22) '3' - '2' + 'm' / 'n' is ________.

A) 2   B) 0   C) 3   D) 1

Section: 4.3 Character Data Type and Operations

23) Which of the following is not a correct method in the Character class?
A) toLowerCase(char)
B) toUpperCase()
C) isDigit()
D) isLetter(char)
E) isLetterOrDigit(char)
Section: 4.3 Character Data Type and Operations

24) The expression "Java " + 1 + 2 + 3 evaluates to ________.
A) Java6
B) java 123
C) Java 123
D) Java123
E) Illegal expression
Section: 4.4 The String Type

25) Which of the following is the correct statement to return JAVA?
A) "Java".toUpperCase("Java")   B) String.toUpperCase("Java")
C) "Java".toUpperCase() D) toUpperCase("Java")
Section: 4.4 The String Type

26) Suppose s1 and s2 are two strings. What is the result of the following code?

```
s1.equals(s2) == s2.equals(s1)
```

A) True B) False
Section: 4.4 The String Type

27) "AbA".compareToIgnoreCase("abC") returns ________.
A) 1   B) -1   C) 2   D) -2   E) 0
Section: 4.4 The String Type

28) What is the return value of "SELECT".substring(0, 5)?
A) "SELE"   B) "SELEC"   C) "SELECT"   D) "ELECT"
Section: 4.4 The String Type

29) The ________ method parses a string s to an int value.
A) integer.parseInteger(s);   B) Integer.parseInt(s);
C) Integer.parseInteger(s);   D) integer.parseInt(s);
Section: 4.4 The String Type

30) The statement System.out.printf("%5d", 123456) outputs ________.
A) 12345   B) 12345.6   C) 123456   D) 23456
Section: 4.6 Formatting Console Output

31) How many times will the following code print "Welcome to Java"?

```
int count = 0;
while (count &lt; 10) {
  System.out.println("Welcome to Java");
  count++;
}
```

A) 9   B) 0   C) 10   D) 8   E) 11

Section: 5.2 The while Loop

32) How many times will the following code print "Welcome to Java"?

```
int count = 0;
while (count++ &lt; 10) {
  System.out.println("Welcome to Java");
}
```

A) 9 B) 8 C) 10 D) 0 E) 11

Section: 5.2 The while Loop

33) What will be displayed when the following code is executed?

```
int number = 6;
while (number &gt; 0) {
  number -= 3;
  System.out.print(number + " ");
}
```

A) 3 0 -3 B) 0 -3 C) 3 0 D) 6 3 E) 6 3 0

Section: 5.2 The while Loop

34) How many times will the following code print "Welcome to Java"?

```
int count = 0;
do {
  System.out.println("Welcome to Java");
} while (count++ &lt; 10);
```

A) 8 B) 9 C) 10 D) 11 E) 0

Section: 5.6 The do-while Loop

35) What is the value in count after the following loop is executed?

```
int count = 0;
do {
  System.out.println("Welcome to Java");
} while (count++ &lt; 9);
System.out.println(count);
```

A) 8 B) 9 C) 10 D) 11 E) 0

Section: 5.6 The do-while Loop

36) Which of the following loops prints "Welcome to Java" 10 times?

A:

```
for (int count = 1; count &lt;= 10; count++) {
  System.out.println("Welcome to Java");
}
```

B:

```
for (int count = 0; count &lt; 10; count++) {
  System.out.println("Welcome to Java");
}
```

C:

```
for (int count = 1; count &lt; 10; count++) {
  System.out.println("Welcome to Java");
}
```

D:
```
for (int count = 0; count &lt;= 10; count++) {
  System.out.println("Welcome to Java");
}
```
A) AB   B) ABC C) BD   D) AC   E) BC

Section: 5.7 The for Loop

37) The following loop displays ________.

```
for (int i = 1; i &lt;= 10; i++) {
  System.out.print(i + " ");
  i++;
}
```
A) 1 2 3 4 5 6 7 8 9

B) 2 4 6 8 10

C) 1 2 3 4 5 6 7 8 9 10

D) 1 3 5 7 9

E) 1 2 3 4 5

Section: 5.7 The for Loop

38) What is i after the following for loop?

```
int y = 0;
for (int i = 0; i &lt; 10; ++i) {
  y += i;
}
```
A) 11   B) 9   C) 10   D) undefined

Section: 5.7 The for Loop

39) Analyze the following fragment:

```
double sum = 0;
double d = 0;
while (d != 10.0) {
  d += 0.1;
  sum += sum + d;
}
```
A) The program never stops because d is always 0.1 inside the loop.

B) After the loop, sum is 0 + 0.1 + 0.2 + 0.3 + ... + 1.9

C) The program may not stop because of the phenomenon referred to as numerical inaccuracy for operating with floating-point numbers.

D) The program does not compile because sum and d are declared double, but assigned with integer value 0.

Section: 5.8 Which Loop to Use?

40) How many times is the println statement executed?

```
for (int i = 0; i &lt; 10; i++)
  for (int j = 0; j &lt; 10; j++)
    System.out.println(i * j);
```

A) 100 B) 10   C) 45   D) 20

Section: 5.9 Nested Loops

41) Analyze the following code.

```
double sum = 0;
```

```
for (double d = 0; d &lt; 10; sum += sum + d) {
  d += 0.1;
}
```

A) The program compiles but does not stop because d would always be less than 10.
B) The program has a syntax error because the adjustment statement is incorrect in the for loop.
C) The program has a syntax error because the control variable in the for loop cannot be of the double type.
D) The program compiles and runs fine.
Section: 5.10 Minimizing Numerical Errors

42) Will the following program terminate?

```
int balance = 10;

while (true) {
  if (balance &lt; 9)
    break;
  balance = balance - 9;
}
```

A) Yes B) No
Section: 5.12 Keywords break and continue

43) What is the output after the following loop terminates?

```
int number = 25;
int i;

boolean isPrime = true;
for (i = 2; i &lt; number && isPrime; i++) {
  if (number % i == 0) {
    isPrime = false;
  }
}

System.out.println("i is " + i + " isPrime is " + isPrime);
```

A) i is 5 isPrime is false B) i is 6 isPrime is true
C) i is 5 isPrime is true D) i is 6 isPrime is false
Section: 5.12 Keywords break and continue

44) Will the following program terminate?

```
int balance = 10;

while (true) {
  if (balance &lt; 9)
    continue;
  balance = balance - 9;
}
```

A) Yes B) No
Section: 5.12 Keywords break and continue

45) What is the value of balance after the following code is executed?

```
int balance = 10;

while (balance &gt;= 1) {
  if (balance &lt; 9)
    break;
  balance = balance - 9;
}
```

A) 0 B) 2 C) 1 D) -1

Section: 5.12 Keywords break and continue

46) What is the number of iterations in the following loop?

```
  for (int i = 1; i &lt;= n; i++) {
    // iteration
  }
```

A) n - 1 B) n C) 2*n D) n + 1

Section: 5.13 Case Study: Checking Palindromes

47) Suppose your method does not return any value, which of the following keywords can be used as a return type?

A) double

B) int

C) void

D) public

E) None of the above

Section: 6.2 Defining a Method

48) All Java applications must have a method ________.

A) public static Main(String[] args)

B) public static main(String[] args)

C) public static void main(String[] args)

D) public void main(String[] args)

E) public static Main(String args[])

Section: 6.2 Defining a Method

49) Does the return statement in the following method cause compile errors?

```
public static void main(String[] args) {
  int max = 0;
  if (max != 0)
    System.out.println(max);
  else
    return;
}
```

A) Yes B) No

Section: 6.3 Calling a Method

50) Each time a method is invoked, the system stores parameters and local variables in an area of memory, known as ________, which stores elements in last-in first-out fashion.

A) storage area B) an array C) a heap D) a stack

Section: 6.3 Calling a Method

51) You should fill in the blank in the following code with ________.

```
public class Test {
  public static void main(String[] args) {
    System.out.print("The grade is ");
    printGrade(78.5);

    System.out.print("The grade is ");
    printGrade(59.5);
  }
  public static ________ printGrade(double score) {
    if (score &gt;= 90.0) {
      System.out.println('A');
    }
    else if (score &gt;= 80.0) {
      System.out.println('B');
    }
    else if (score &gt;= 70.0) {
      System.out.println('C');
    }
      else if (score &gt;= 60.0) {
      System.out.println('D');
    }
    else {
      System.out.println('F');
    }
  }
}
```

A) void B) boolean C) char D) double E) int

Section: 6.4 void vs. Value-Returning Methods

52) Consider the following incomplete code:

```
public class Test {
  public static void main(String[] args) {
    System.out.println(f(5));
  }

  public static int f(int number) {
    // Missing body
  }
}
```

The missing method body should be ________.

A) System.out.println(number); B) System.out.println("number");
C) return number; D) return "number";

Section: 6.4 void vs. Value-Returning Methods

53) Given the following method

```
static void nPrint(String message, int n) {
  while (n &gt; 0) {
    System.out.print(message);
    n--;
  }
}
```

What is the output of the call nPrint('a', 4)?

A) aaaaa B) invalid call C) aaaa D) aaa

Section: 6.5 Passing Parameters by Values

54) A variable defined inside a method is referred to as ________.

A) a block variable B) a method variable C) a global variable D) a local variable

Section: 6.9 The Scope of Variables

55) (int)(Math.random() * (65535 + 1)) returns a random number ________.

A) between 1 and 65536 B) between 1 and 65535

C) between 0 and 65536 D) between 0 and 65535
Section: 6.10 Case Study: Generating Random Characters

56) (char)('a' + Math.random() * ('z' - 'a' + 1)) returns a random character ________.
A) between 'a' and 'y' B) between 'b' and 'z'
C) between 'a' and 'z' D) between 'b' and 'y'
Section: 6.10 Case Study: Generating Random Characters

57) The client can use a method without knowing how it is implemented. The details of the implementation are encapsulated in the method and hidden from the client who invokes the method. This is known as ________.
A) simplifying method B) information hiding
C) encapsulation D) method hiding
Section: 6.11 Method Abstraction and Stepwise Refinement

58) ________ is a simple but incomplete version of a method.
A) A method developed using top-down approach
B) A non-main method
C) A main method
D) A stub
Section: 6.11 Method Abstraction and Stepwise Refinement

59) Which of the following are incorrect?
A) int[] a = new int[2];
B) int a() = new int[2];
C) int[] a = new int(2);
D) int a[] = new int[2];
E) int a = new int[2];
Section: 7.2 Array Basics

60) Suppose int i = 5, which of the following can be used as an index for array double[] t = new double[100]?
A) i
B) i + 10
C) i + 6.5
D) (int)(Math.random() * 100))
E) Math.random() * 100
Section: 7.2 Array Basics

61) Assume int[] t = {1, 2, 3, 4}. What is t.length?
A) 0 B) 3 C) 4 D) 5
Section: 7.2 Array Basics

62) Analyze the following code:

```
public class Test {
  public static void main(String[] args) {
    double[] x = {2.5, 3, 4};
    for (double value: x)
      System.out.print(value + " ");
  }
}
```

A) The program displays 2.5, 3, 4
B) The program displays 2.5, 3.0 4.0
C) The program displays 2.5 3 4
D) The program displays 2.5 3.0 4.0

E) The program has a syntax error because value is undefined.
Section: 7.2 Array Basics

63) Which of the following are correct?
A) String[] list = {"red", "yellow", "green"};
B) String[] list = new String{"red", "yellow", "green"};
C) String list = new String{"red", "yellow", "green"};
D) String[] list = new String[]{"red", "yellow", "green"};
E) String list = {"red", "yellow", "green"};
Section: 7.2 Array Basics

64) Analyze the following code:

```
public class Test {
  public static void main(String[] args) {
    int[] x = {1, 2, 3, 4};
    int[] y = x;

    x = new int[2];

    for (int i = 0; i &lt; y.length; i++)
      System.out.print(y[i] + " ");
  }
}
```

A) The program displays 1 2 3 4 B) The program displays 0 0 0 0
C) The program displays 0 0 D) The program displays 0 0 3 4
Section: 7.5 Copying Arrays

65) Show the output of the following code:

```
public class Test {
  public static void main(String[] args) {
    int[] x = {1, 2, 3, 4, 5};
    increase(x);

    int[] y = {1, 2, 3, 4, 5};
    increase(y[0]);

    System.out.println(x[0] + " " + y[0]);
  }

  public static void increase(int[] x) {
    for (int i = 0; i &lt; x.length; i++)
      x[i]++;
  }

  public static void increase(int y) {
    y++;
  }
}
```

A) 1 2 B) 2 1 C) 0 0 D) 2 2 E) 1 1
Section: 7.6 Passing Arrays to Methods

66) Analyze the following code:

```
public class Test {
  public static void main(String[] args) {
    int[] oldList = {1, 2, 3, 4, 5};
    reverse(oldList);
    for (int i = 0; i &lt; oldList.length; i++)
      System.out.print(oldList[i] + " ");
  }

  public static void reverse(int[] list) {
    int[] newList = new int[list.length];

    for (int i = 0; i &lt; list.length; i++)
      newList[i] = list[list.length - 1 - i];

    list = newList;
  }
}
```

A) The program displays 5 4 3 2 1.
B) The program displays 1 2 3 4 5.
C) The program displays 5 4 3 2 1 and then raises an ArrayIndexOutOfBoundsException.
D) The program displays 1 2 3 4 5 and then raises an ArrayIndexOutOfBoundsException.
Section: 7.6 Passing Arrays to Methods

67) The reverse method is defined in this section. What is list1 after executing the following statements?

```
int[] list1 = {1, 2, 3, 4, 5, 6};
int[] list2 = reverse(list1);
```

A) list1 is 6 6 6 6 6 6 B) list1 is 1 2 3 4 5 6 C) list1 is 6 5 4 3 2 1 D) list1 is 0 0 0 0 0 0
Section: 7.7 Returning an Array from a Method

68) If a key is not in the list, the binarySearch method returns ________.
A) -(insertion point + 1) B) insertion point - 1
C) insertion point D) -insertion point
Section: 7.10 Searching Arrays

69) The ________ method sorts the array scores of the double[] type.
A) java.util.Arrays.sorts(scores) B) java.util.Arrays(scores)
C) Njava.util.Arrays.sortArray(scores) D) java.util.Arrays.sort(scores)
Section: 7.12 The Arrays Class

70) Which code fragment would correctly identify the number of arguments passed via the command line to a Java application, excluding the name of the class that is being invoked?
A) `int count = 0; while (args[count] != null) count ++;`
B) `int count=0; while (!(args[count].equals(""))) count ++;`
C) `int count = args.length;`
D) `int count = args.length - 1;`
Section: 7.13 Command-Line Arguments

71) Which of the following statements is correct?
A) char[][] charArray = {a', 'b'}; B) char[][] charArray = {{a', 'b'}, {c', 'd'}};
C) char[2][2] charArray = {{a', 'b'}, {c', 'd'}}; D) char[2][] charArray = {{a', 'b'}, {c', 'd'}};
Section: 8.2 Two-Dimensional Array Basics

72) What is the index variable for the element at the first row and first column in array a?
A) a[1][1] B) a[1][0] C) a[0][0] D) a[0][1]
Section: 8.2 Two-Dimensional Array Basics

73) How many elements are in array matrix (int[][] matrix = new int[5][5])?

A) 14 B) 20 C) 30 D) 25

Section: 8.2 Two-Dimensional Array Basics

74) Assume int[][] x = {{1, 2}, {3, 4}, {5, 6}}, what are x.length are x[0].length?

A) 3 and 2 B) 3 and 3 C) 2 and 1 D) 2 and 2 E) 2 and 3

Section: 8.2 Two-Dimensional Array Basics

75) What is the output of the following program?

```
public class Test {
  public static void main(String[] args) {
    int[][] values = {{3, 4, 5, 1}, {33, 6, 1, 2}};

    int v = values[0][0];
    for (int row = 0; row &lt; values.length; row++)
      for (int column = 0; column &lt; values[row].length; column++)
        if (v &lt; values[row][column])
          v = values[row][column];

    System.out.print(v);
  }
}
```

A) 33 B) 6 C) 1 D) 3 E) 5

Section: 8.3 Processing Two-Dimensional Arrays

76) What is the output of the following program?

```
public class Test {
  public static void main(String[] args) {
    int[][] values = {{3, 4, 5, 1 }, {33, 6, 1, 2}};

    for (int row = 0; row &lt; values.length; row++) {
      java.util.Arrays.sort(values[row]);
      for (int column = 0; column &lt; values[row].length; column++)
        System.out.print(values[row][column] + " ");
      System.out.println();
    }
  }
}
```

A) The program prints one row 1 3 4 5 1 2 6 33

B) The program prints two rows 3 4 5 1 followed by 33 6 1 2

C) The program prints two rows 3 4 5 1 followed by 2 1 6 33

D) The program prints two rows 1 3 4 5 followed by 1 2 6 33

E) The program prints on row 3 4 5 1 33 6 1 2

Section: 8.3 Processing Two-Dimensional Arrays

77) What is the output of the following code?

```
public class Test5 {
  public static void main(String[] args) {
    int[][] matrix =
      {{1, 2, 3, 4},
        {4, 5, 6, 7},
        {8, 9, 10, 11},
        {12, 13, 14, 15}};

    for (int i = 0; i &lt; 4; i++)
      System.out.print(matrix[1][i] + " ");
  }
}
```

A) 2 5 9 13	B) 1 3 8 12	C) 4 5 6 7	D) 1 2 3 4	E) 3 6 10 14

Section: 8.3 Processing Two-Dimensional Arrays

78) What is the output of the following program?

```
public class Test {
  public static void main(String[] args) {
    int[][] values = {{3, 4, 5, 1}, {33, 6, 1, 2}};

    for (int row = 0; row &lt; values.length; row++) {
      System.out.print(m(values[row]) + " ");
    }
  }

  public static int m(int[] list) {
    int v = list[0];
    for (int i = 1; i &lt; list.length; i++)
      if (v &lt; list[i])
        v = list[i];
    return v;
  }
}
```

A) 1 1	B) 5 6	C) 33 5	D) 5 33	E) 3 33

Section: 8.4 Passing Two-Dimensional Arrays to Methods

79) Which of the following statements are correct?

A) char[2][2][] charArray = {a', 'b'};

B) char[][][] charArray = new char[2][2][];

C) char[][][] charArray = {{{a', 'b'}, {c', 'd'}, {e', 'f'}}};

D) char[][][] charArray = {{a', 'b'}, {c', 'd'}, {e', 'f'}};

Section: 8.8 Multidimensional Arrays

80) What is the output of the following code?

```
public class Test {
  public static void main(String[] args) {
    int[][][] data = {{{1, 2}, {3, 4}},
      {{5, 6}, {7, 8}}};

    System.out.print(ttt(data[0]));
  }

  public static int ttt(int[][] m) {
    int v = m[0][0];

    for (int i = 0; i &lt; m.length; i++)
      for (int j = 0; j &lt; m[i].length; j++)
        if (v &lt; m[i][j])
          v = m[i][j];

    return v;
  }
}
```

A) 1	B) 2	C) 4	D) 5	E) 6

Section: 8.8 Multidimensional Arrays

81) An object is an instance of a ________.

A) class B) method	C) data D) program

Section: 9.2 Defining Classes for Objects

82) Which of the following statements are true?
A) A default constructor is provided automatically if no constructors are explicitly declared in the class.
B) At least one constructor must always be defined explicitly.
C) The default constructor is a no-arg constructor.
D) Every class has a default constructor.
Section: 9.4 Constructing Objects Using Constructors

83) Given the declaration Circle x = new Circle(), which of the following statements is most accurate?
A) You can assign an int value to x. B) x contains an object of the Circle type.
C) x contains a reference to a Circle object. D) x contains an int value.
Section: 9.5 Accessing Objects via Reference Variables

84) Which of the following statements are correct?
A) A reference variable is an object.
B) A reference variable references to an object.
C) A data field in a class must be of a primitive type.
D) A data field in a class can be of an object type.
Section: 9.5 Accessing Objects via Reference Variables

85) A method that is associated with an individual object is called ________.
A) a class method B) a static method
C) an instance method D) an object method
Section: 9.7 Static Variables, Constants, and Methods

86) What code may be filled in the blank without causing syntax or runtime errors?

```
public class Test {
  java.util.Date date;

  public static void main(String[] args) {
    Test test = new Test();
    System.out.println(________);
  }
}
```

A) test.date B) date C) test.date.toString() D) date.toString()
Section: 9.7 Static Variables, Constants, and Methods

87) To prevent a class from being instantiated, ________.
A) use the private modifier on the constructor B) use the static modifier on the constructor
C) don't use any modifiers on the constructor D) use the public modifier on the constructor
Section: 9.8 Visibility Modifiers

88) Which is the advantage of encapsulation?
A) It changes the implementation without changing a class's contract and causes no consequential changes to other code.
B) It changes a class's contract without changing the implementation and causes no consequential changes to other code.
C) Making the class final causes no consequential changes to other code.
D) Only public methods are needed.
Section: 9.9 Data Field Encapsulation

89) What is the value of times displayed?

```
public class Test {
  public static void main(String[] args) {
    Count myCount = new Count();
    int times = 0;

    for (int i=0; i&lt;100; i++)
      increment(myCount, times);

    System.out.println(
      "myCount.count =   " + myCount.count);
    System.out.println("times = "+ times);
  }

  public static void increment(Count c, int times) {
    c.count++;
    times++;
  }
}

class Count {
  int count;

  Count(int c) {
    count = c;
  }

  Count() {
    count = 1;
  }
}
```

A) 0   B) 98   C) 99   D) 100   E) 101

Section: 9.10 Passing Objects to Methods

90) Given the declaration Circle[] x = new Circle[10], which of the following statements is most accurate?

A) x contains a reference to an array and each element in the array can hold a reference to a Circle object.

B) x contains a reference to an array and each element in the array can hold a Circle object.

C) x contains an array of ten objects of the Circle type.

D) x contains an array of ten int values.

Section: 9.11 Array of Objects

91) What is the output for the second statement in the main method?

```
public class Foo {
  static int i = 0;
  static int j = 0;

  public static void main(String[] args) {
    int i = 2;
    int k = 3;
    {
      int j = 3;
      System.out.println("i + j is " + i + j);
    }

    k = i + j;
    System.out.println("k is " + k);
    System.out.println("j is " + j);
  }
}
```

A) k is 0   B) k is 1 C) k is 2D) k is 3

Section: 9.13 Scope of Variables

92) To create an instance of BigInteger for 454, use ________.
A) BigInteger(454);   B) BigInteger("454");
C) new BigInteger(454); D) new BigInteger("454");
Section: 10.9 The BigInteger and BigDecimal Classes

93) To add BigInteger b1 to b2, you write ________.
A) b2 = b2.add(b1);
B) b1.add(b2);
C) b2 = b1.add(b2);
D) b2.add(b1);
E) b1 = b2.add(b1);
Section: 10.9 The BigInteger and BigDecimal Classes

94) To divide BigDecimal b1 by b2 and assign the result to b1, you write ________.
A) b1.divide(b2);
B) b2 = b2.divide(b1);
C) b2.divide(b1);
D) b1 = b1.divide(b2);
E) b1 = b2.divide(b1);
Section: 10.9 The BigInteger and BigDecimal Classes

95) What is the output of the following code?

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

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

A) s1 and s2 reference to the same String object   B) s1 and s2 reference to different String objects
Section: 10.10 The String Class

96) Assume s is " abc ", the method ________ returns a new string "abc".
A) s.trim()   B) s.trim(s)   C) trim(s)   D) String.trim(s)
Section: 10.10 The String Class

97) Assume s is "ABCABC", the method ________ returns an array of characters.
A) s.toCharArray()
B) String.toCharArray()
C) toChars(s)
D) s.toChars()
E) String.toChars()
Section: 10.10 The String Class

98) What is displayed by the following statement?

```
System.out.println("Java is neat".replaceAll("is", "AAA"));
```

A) JavaAAA neat   B) Java AAA neat   C) Java AAAneat   D) JavaAAAneat
Section: 10.10 The String Class

99) What is displayed by the following code?

```
    System.out.print("A,B;C".replaceAll(",;", "#") + " ");
    System.out.println("A,B;C".replaceAll("[,;]", "#"));
```

A) A B C A B C B) A,B;C A#B#CC) A B C A#B#CD) A#B#C A#B#C

Section: 10.10 The String Class

100) Analyze the following code:

```
class Test {
  public static void main(String[] args)  {
    StringBuilder strBuf = new StringBuilder(4);
    strBuf.append("ABCDE");
    System.out.println("What's strBuf.charAt(5)? " + strBuf.charAt(5));
  }
}
```

A) The program has a runtime error because because the buffer's capacity is 4, but five characters "ABCDE" are appended into the buffer.

B) The program has a runtime error because the length of the string in the buffer is 5 after "ABCDE" is appended into the buffer. Therefore, strBuf.charAt(5) is out of range.

C) The program compiles and runs fine.

D) The program has a compile error because you cannot specify initial capacity in the StringBuilder constructor.

Section: 10.11 The StringBuilder/StringBuffer Class

101) What is the output of running class C?

```
class A {
  public A() {
    System.out.println(
      "The default constructor of A is invoked");
  }
}

class B extends A {
  public B() {
    System.out.println(
      "The default constructor of B is invoked");
  }
}

public class C  {
  public static void main(String[] args) {
    B b = new B();
  }
}
```

A) "The default constructor of A is invoked"

B) "The default constructor of B is invoked" followed by "The default constructor of A is invoked"

C) "The default constructor of B is invoked"

D) Nothing displayed

E) "The default constructor of A is invoked" followed by "The default constructor of B is invoked"

Section: 11.3 Using the super Keyword

102) Which of the statements regarding the super keyword is incorrect?

A) You can use super to invoke a super class constructor.

B) You cannot invoke a method in superclass's parent class.

C) You can use super.super.p to invoke a method in superclass's parent class.

D) You can use super to invoke a super class method.

Section: 11.3 Using the super Keyword

103) The getValue() method is overridden in two ways. Which one is correct?

I:

```
public class Test {
  public static void main(String[] args) {
    A a = new A();
    System.out.println(a.getValue());
  }
}

class B {
  public String getValue() {
    return "Any object";
  }
}

class A extends B {
  public Object getValue() {
    return "A string";
  }
}
```

II:

```
public class Test {
  public static void main(String[] args) {
    A a = new A();
    System.out.println(a.getValue());
  }
}

class B {
  public Object getValue() {
    return "Any object";
  }
}

class A extends B {
  public String getValue() {
    return "A string";
  }
}
```

A) I B) II C) Both I and II D) Neither

Section: 11.4 Overriding Methods

104) Analyze the following code:

```
public class Test {
  public static void main(String[] args) {
    new B();
  }
}

class A {
  int i = 7;

  public A() {
    setI(20);
    System.out.println("i from A is " + i);
  }
  public void setI(int i) {
    this.i = 2 * i;
  }
}

class B extends A {
  public B() {
    // System.out.println("i from B is " + i);
  }

  @Override
  public void setI(int i) {
    this.i = 3 * i;
  }
}
```

A) The constructor of class A is called and it displays "i from A is 7".
B) The constructor of class A is called and it displays "i from A is 60".
C) The constructor of class A is called and it displays "i from A is 40".
D) The constructor of class A is not called.
Section: 11.5 Overriding vs. Overloading

105) Given the following classes and their objects:

```
class C1 {};
class C2 extends C1 {};
class C3 extends C1 {};

C2 c2 = new C2();
C3 c3 = new C3();
```

Analyze the following statement:

c2 = (C2)((C1)c3);
A) c3 is cast into c2 successfully.
B) The statement is correct.
C) You will get a runtime error because the Java runtime system cannot perform multiple casting in nested form.
D) You will get a runtime error because you cannot cast objects from sibling classes.
Section: 11.9 Casting Objects and the instanceof Operator

106) Analyze the following code:

```
public class Test {
  public static void main(String[] args) {
    String s = new String("Welcome to Java");
    Object o = s;
    String d = (String)o;
  }
}
```

A) When casting o to s in String d = (String)o, a new object is created.
B) When casting o to s in String d = (String)o, the contents of o is changed.
C) s, o, and d reference the same String object.
D) When assigning s to o in Object o = s, a new object is created.
Section: 11.9 Casting Objects and the instanceof Operator

107) What is the output of the following code?

```
public class Test {
  public static void main(String[] args) {
    Object o1 = new Object();
    Object o2 = new Object();
    System.out.print((o1 == o2) + " " + (o1.equals(o2)));
  }
}
```

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

Section: 11.10 The Object's equals() Method

108) Analyze the following code:

```
// Program 1
public class Test {
  public static void main(String[] args) {
    Object a1 = new A();
    Object a2 = new A();
    System.out.println(((A)a1).equals((A)a2));
  }
}

class A {
  int x;

  public boolean equals(A a) {
    return this.x == a.x;
  }
}


// Program 2
public class Test {
  public static void main(String[] args) {
    A a1 = new A();
    A a2 = new A();
    System.out.println(a1.equals(a2));
  }
}

class A {
  int x;

  public boolean equals(A a) {
    return this.x == a.x;
  }
}
```

A) Program 1 displays true and Program 2 displays true.
B) Program 1 displays false and Program 2 displays true.
C) Program 1 displays true and Program 2 displays false.
D) Program 1 displays false and Program 2 displays false.

Section: 11.10 The Object's equals() Method

109) Suppose an ArrayList list contains {"red", "green", "red", "green"}. What is the list after the following code?

```
    list.remove("red");
```

A) {"green", "green"} B) {"green", "red", "green"}
C) {"red", "green", "red", "green"}D) {"red", "green", "green"}

Section: 11.11 The ArrayList Class

110) Composition means ________.
A) that data fields should be declared private
B) that a class extends another class
C) that a variable of supertype refers to a subtype object
D) that a class contains a data field that references another object
Section: Comprehensive

111) An instance of ________ describes programming errors, such as bad casting, accessing an out-of-bounds array, and numeric errors.
A) RuntimeException
B) Exception
C) Error
D) Throwable
E) NumberFormatException
Section: 12.3 Exception Types

112) What exception type does the following program throw?

```
public class Test {
  public static void main(String[] args) {
    String s = "abc";
    System.out.println(s.charAt(3));
  }
}
```

A) ArithmeticException
B) ArrayIndexOutOfBoundsException
C) StringIndexOutOfBoundsException
D) ClassCastException
E) No exception
Section: 12.3 Exception Types

113) Analyze the following code:

```
public class Test {
  public static void main(String[] args) {
    try {
      String s = "5.6";
      Integer.parseInt(s); // Cause a NumberFormatException

      int i = 0;
      int y = 2 / i;
    }
    catch (Exception ex) {
      System.out.println("NumberFormatException");
    }
    catch (RuntimeException ex) {
      System.out.println("RuntimeException");
    }
  }
}
```

A) The program has a compile error.
B) The program displays NumberFormatException followed by RuntimeException.
C) The program displays RuntimeException.
D) The program displays NumberFormatException.
Section: 12.4 More on Exception Handling

114) What is displayed on the console when running the following program?

```
public class Test {
  public static void main(String[] args) {
    try {
      p();
      System.out.println("After the method call");
    }
    catch (NumberFormatException ex) {
      System.out.println("NumberFormatException");
    }
    catch (RuntimeException ex) {
      System.out.println("RuntimeException");
    }
  }

  static void p() {
    String s = "5.6";
    Integer.parseInt(s); // Cause a NumberFormatException

    int i = 0;
    int y = 2 / i;
    System.out.println("Welcome to Java");
  }
}
```

A) The program displays NumberFormatException.

B) The program displays RuntimeException.

C) The program displays NumberFormatException followed by After the method call.

D) The program has a compile error.

E) The program displays NumberFormatException followed by RuntimeException.

Section: 12.4 More on Exception Handling

115) What is displayed on the console when running the following program?

```
public class Test {
  public static void main (String[] args) {
    try {
      System.out.println("Welcome to Java");
    }
    finally {
      System.out.println("The finally clause is executed");
    }
  }
}
```

A) The finally clause is executed

B) Welcome to Java

C) Welcome to Java followed by The finally clause is executed in the next line

D) none of the above

Section: 12.5 The finally Clause

116) What is displayed on the console when running the following program?

```
public class Test {
  public static void main(String[] args) {
    try {
      System.out.println("Welcome to Java");
      int i = 0;
      int y = 2/i;
      System.out.println("Welcome to Java");
    }
    catch (RuntimeException ex) {
      System.out.println("Welcome to Java");
    }
    finally {
      System.out.println("End of the block");
    }
  }
}
```

A) The program displays Welcome to Java three times followed by End of the block.
B) The program displays Welcome to Java two times followed by End of the block.
C) The program displays Welcome to Java two times.
D) The program displays Welcome to Java three times.
Section: 12.5 The finally Clause

117) Which of the following statements are true?
A) If a directory (e.g., c:\liang) does not exist, new File("c:\liang") creates a new directory named c:\liang.
B) If a file (e.g., c:\temp.txt) does not exist, new File("c:\\temp.txt") returns null.
C) If a directory (e.g., c:\liang) does not exist, new File("c:\liang") returns null.
D) If a file (e.g., c:\temp.txt) does not exist, new File("c:\\temp.txt") creates a new file named c:\temp.txt.
E) none of the above
Section: 12.10 The File Class

118) Which class do you use to read data from a text file?
A) File B) PrintWriter C) Scanner D) System
Section: 12.11 Text I/O

119) Which of the following statements are correct?

I:

```
try (PrintWriter output = new PrintWriter("output.txt")) {
  output.println("Welcome to Java");
}
```

II:

```
try (PrintWriter output = new PrintWriter("output.txt");) {
  output.println("Welcome to Java");
}
```

III:

```
PrintWriter output;
try (output = new PrintWriter("output.txt");) {
  output.println("Welcome to Java");
}
```

IV:

```
try (PrintWriter output = new PrintWriter("output.txt");) {
  output.println("Welcome to Java");
}
finally {
  output.close();
}
```

A) I B) II C) III D) IV
Section: 12.11 Text I/O

120) To create an InputStream to read from a file on a Web server, you use the method ________ in the URL class.

A) connectStream(); B) getInputStream();
C) openStream(); D) obtainInputStream();
Section: 12.12 Reading Data from the Web

121) Which of the following statements regarding abstract methods is false?
A) Abstract classes have constructors.
B) An abstract method cannot be contained in a nonabstract class.
C) A class that contains abstract methods must be abstract.
D) It is possible to declare an abstract class that contains no abstract methods.
E) A data field can be declared abstract.
Section: 13.2 Abstract Classes

122) Analyze the following code. Which of the following statements is correct?

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

A) The program compiles and runs fine.
B) The program has a compile error because intValue is an abstract method in Number.
C) The program has a compile error because the member access operator (.) is executed before the casting operator.
D) The program has a compile error because an Integer instance cannot be assigned to a Number variable.
E) The program has a compile error because x cannot be cast into Integer.
Section: 13.3 Case Study: the Abstract Number Class

123) Assume Calendar calendar = new GregorianCalendar(). ________ returns the month of the year.
A) calendar.get(Calendar.WEEK_OF_YEAR) B) calendar.get(Calendar.MONTH_OF_YEAR)
C) calendar.get(Calendar.MONTH) D) calendar.get(Calendar.WEEK_OF_MONTH)
Section: 13.4 Case Study: Calendar and GregorianCalendar

124) Assume Calendar calendar = new GregorianCalendar(). ________ returns the number of days in a month.
A) calendar.get(Calendar.MONTH_OF_YEAR)
B) calendar.get(Calendar.WEEK_OF_YEAR)
C) calendar.getActualMaximum(Calendar.DAY_OF_MONTH)
D) calendar.get(Calendar.WEEK_OF_MONTH)
E) calendar.get(Calendar.MONTH)
Section: 13.4 Case Study: Calendar and GregorianCalendar

125) ________ is not a reference type.
A) A primitive type B) An array type C) A class type D) An interface type
Section: 13.5 Interfaces

126) The output from the following code is ________.

```
java.util.ArrayList<string></string> list = new java.util.ArrayList<string></string>();
list.add("New York");
java.util.ArrayList<string></string> list1 =
(java.util.ArrayList<string></string>)(list.clone());
list.add("Atlanta");
list1.add("Dallas");
System.out.println(list1);
```

A) [New York, Dallas]   B) [New York, Atlanta]
C) [New York, Atlanta, Dallas]   D) [New York]
Section: 13.7 The Cloneable Interface

127) The Rational class in this chapter is defined as a subclass of java.lang.Number. Which of the following expressions are correct?
A) Rational.doubleValue();
B) Rational.doubleValue("5/4");
C) new Rational(5, 4).intValue();
D) new Rational(5, 4).toDoubleValue();
E) new Rational(5, 4).doubleValue();
Section: 13.9 Case Study: The Rational Class

128) Which of the following statements are true?
A) The constructors may be protected.
B) A class should always contain a no-arg constructor.
C) The constructors must always be public.
D) A class should describe a single entity and all the class operations should logically fit together to support a coherent purpose.
Section: 13.10 Class Design Guidelines

129) What does the following code do?

```
FileInputStream fis = new FileInputStream("test.dat");
```

A) It creates a new file named test.dat regardless of whether it exists or not and opens the file so you can write to it and read from it.
B) It creates a new file named test.dat if it does not exist and opens the file so you can write to it.
C) It creates a new file named test.dat if it does not exist and opens the file so you can write to it and read from it.
D) It creates a new file named test.dat regardless of whether it exists or not and opens the file so you can write to it.
E) It creates a FileInputStream for test.dat if test.dat exists.
Section: 17.4 Binary I/O Classes

130) Which of the following statements is correct to create a DataOutputStream to write to a file named out.dat?
A) DataOutputStream outfile = new DataOutputStream("out.dat");
B) DataOutputStream outfile = new DataOutputStream(FileOutputStream("out.dat"));
C) DataOutputStream outfile = new DataOutputStream(new File("out.dat"));
D) DataOutputStream outfile = new DataOutputStream(new FileOutputStream("out.dat"));
Section: 17.4 Binary I/O Classes

131) After the following program is finished, how many bytes are written to the file t.dat?

```
import java.io.*;

public class Test {
  public static void main(String[] args) throws IOException {
    DataOutputStream output = new DataOutputStream(
      new FileOutputStream("t.dat"));
    output.writeChars("ABCD");
    output.close();
  }
}
```

A) 2 bytes   B) 4 bytes   C) 8 bytes   D) 12 bytes   E) 16 bytes
Section: 17.4 Binary I/O Classes

132) Which of the following statements is true?
A) The methods in an object are serialized.
B) A static variable is not serialized.
C) A transient variable is not serialized.
D) An object must be an instance of Serializable for it to be serialized.
Section: 17.6 Object I/O

133) Which of the following is the legal mode for creating a new RandomAccessFile stream?
A) 'r'   B) "rwx"   C) "rw" D) "w"
Section: 17.7 Random Access Files

134) Analyze the following recursive method.

```
  public static long factorial(int n) {
    return n * factorial(n - 1);
  }
```

A) Invoking factorial(2) returns 2.
B) Invoking factorial(0) returns 0.
C) Invoking factorial(3) returns 6.
D) Invoking factorial(1) returns 1.
E) The method runs infinitely and causes a StackOverflowError.
Section: 18.2 Example: Factorials

135) In the following method, what is the base case?

```
static int xMethod(int n) {
  if (n == 1)
    return 1;
  else
    return n + xMethod(n - 1);
}
```

A) n is less than 1   B) n is 1 C) n is greater than 1   D) no base case
Section: 18.4 Problem Solving Using Recursion

136) Fill in the code to complete the following method for checking whether a string is a palindrome.

```
public static boolean isPalindrome(String s) {
  if (s.length() &lt;= 1) // Base case
    return true;
  else if ________
    return false;
  else
    return isPalindrome(s.substring(1, s.length() - 1));
}
```

A) `(s.charAt(1) != s.charAt(s.length())) // Base case`
B) `(s.charAt(0) != s.charAt(s.length() - 1)) // Base case`
C) `(s.charAt(0) != s.charAt(s.length())) // Base case`
D) `(s.charAt(1) != s.charAt(s.length() - 1)) // Base case`
Section: 18.4 Problem Solving Using Recursion

137) Fill in the code to complete the following method for sorting a list.

```
public static void sort(double[] list) {
  ________;
}

public static void sort(double[] list, int high) {
  if (high &gt; 1) {
    // Find the largest number and its index
    int indexOfMax = 0;
    double max = list[0];
    for (int i = 1; i &lt;= high; i++) {
      if (list[i] &gt; max) {
        max = list[i];
        indexOfMax = i;
      }
    }

    // Swap the largest with the last number in the list
    list[indexOfMax] = list[high];
    list[high] = max;

    // Sort the remaining list
    sort(list, high - 1);
  }
}
```

A) `sort(list, list.length)`   B) `sort(list, list.length - 1)`

C) `sort(list)`   D) `sort(list, list.length - 2)`

Section: 18.5 Recursive Helper Methods

138) How many times is the recursive moveDisks method invoked for 4 disks?

A) 5   B) 10   C) 15   D) 20

Section: 18.7 Tower of Hanoi

Answers to Java Question Bank

1) C
2) A, B
3) C
4) E
5) A
6) B
7) D
8) C
9) D
10) E
11) D
12) A, B
13) C
14) B
15) B
16) A
17) D
18) A
19) D
20) B
21) A, B
22) D
23) B, C
24) C
25) C
26) A
27) D
28) B
29) B
30) C
31) C
32) C
33) C
34) D
35) C
36) A
37) D
38) D
39) C
40) A
41) D
42) A
43) D
44) B
45) C
46) B
47) C
48) C
49) B
50) D
51) A
52) C
53) B
54) D
55) D

56) C
57) B, C
58) D
59) B, C, E
60) A, B, D
61) C
62) D
63) A, D
64) A
65) B
66) B
67) B
68) A
69) D
70) C
71) B
72) C
73) D
74) A
75) A
76) D
77) C
78) D
79) B, C
80) C
81) A
82) A, C
83) C
84) B, D
85) C
86) A
87) A
88) A
89) A
90) A
91) C
92) D
93) A, C
94) D
95) A
96) A
97) A
98) B
99) B
100) B
101) E
102) C
103) B
104) B
105) D
106) C
107) D
108) A
109) B
110) D
111) A
112) C
113) A
114) A
115) C
116) B
117) E

118) C
119) A, B, C
120) C
121) E
122) C
123) C
124) C
125) A
126) A
127) C, E
128) A, D
129) E
130) D
131) C
132) D
133) C
134) E
135) B
136) B
137) B
138) C