Note: Correct responses are based on Java, **J2sdk v 1.7.25**, from Sun Microsystems, Inc. All provided code segments are intended to be syntactically correct, unless otherwise stated (i. e. `error` is an answer choice) and any necessary Java 2 Standard Packages have been imported. Ignore any typographical errors and assume any undefined variables are defined as used. **For all output statements, assume that the System class has been statically imported…**   *import static java.lang.System.*;*

QUESTION 1

What is $101_2 * 11_2$ in base 10?

A. 12   B. 21   C. 1111   D. 15   E. 17

QUESTION 2

What is output by the code to the right?

A. 7.5   B. 5.5   C. 5   D. 5.0   E. 325

```
int i = 3;
double q = 2.5;
out.println(i + q);
```

QUESTION 3

What is output by the code to the right?

A. 35   B. 15   C. 8   D. 11

E. No output due to Exception

```
int x = 3;
out.println(x += 3 + 5);
```

QUESTION 4

What is output by the code to the right?

A. 20   B. 30   C. 55   D. 45   E. 100

```
int x = 0;
for (int y = 0; y <= 10; y += 2)
  x += y;
out.println(x);
```

QUESTION 5

What is output by the code to the right?

A. Cikn   B. Chicken

C. nekcihC   D. nekcih

E. No output due to Exception

```
String s = "Chicken";
String o = "";
for (int i=s.length()-1; i>=0; i--)
  o += s.charAt(i);
out.println(o);
```

QUESTION 6

What is output by the code to the right?

A. 70   B. 24   C. 60   D. 35   E. 99

```
int[] r = {1,2,3,4,5,6,7};
out.println(r[1] * r[4] * r[6]);
```

QUESTION 7

What is output by the code to the right?

A. truetruetrue   B. falsetruefalse

C. truetruefalse   D. truefalsetrue

E. falsefalsetrue

```
boolean x = true;
boolean y = !x;
out.print(x || y);
out.print(x || (x && y));
out.print((x && y) || !x);
```

QUESTION 8

What is output by the code to the right?

A. HXQZ   B. H

C. HQ   D. HXZ

E. There is no output due to a run-time exception.

```
int x = 5;
if (x == 5)
  out.print("H");
if (x == 5)
  out.print("X");
else if (x == 5)
  out.print("Q");
if (x == 5)
  out.print("Z");
```

QUESTION 9

What is output by the code to the right?

A. 3525   B. 16   C. 15.5   D. 13   E. 10.5

```
out.println(3 + 5 * 2.5);
```

QUESTION 10

What is output by the code to the right?

A. Wha-ha-ha   B. Vampire

C. Mmm, blood!   D. talk

E. There is no output due to a run-time exception.

```
class Monster {
  public void talk() {
    out.println("Wha-ha-ha");
  }
}
class Vampire extends Monster {
  public void talk() {
    out.println("Mmm, blood!");
  }
}

///////////////////////////////
//// client code ///////////////
Monster m = new Vampire();
m.talk();
```

QUESTION 11

What is output by the code to the right?

A. 81.0   B. 5   C. 12   D. 5.0   E. 7.0

```
double x = Math.hypot(3, 4);
out.println(x);
```

QUESTION 12

What is output by the code to the right?

A. 25.0   B. 25   C. 20   D. 19   E. 30

```
int x = 25;
out.printf("%x", x);
```

QUESTION 13

What is output by the code to the right?

A. lo   B. Hello

C. llo   D. He\b\bl\b\b\blo

E. There is no output due to a run-time exception.

```
out.println("He\b\bl\b\b\blo");
```

QUESTION 14

What is output by the code to the right?

A. 29   B. 27

C. 78   D. 65

E. 73

```
int[][] ray =
      {{1,2,3},{2,3,4},{3,4,5}};
int q = 100;
for (int r=0;r<ray.length;r++)
  for (int c=0;c<ray[r].length;c++)
    q -= ray[r][c];
out.println(q);
```

QUESTION 15

What is output by the code to the right?

A. 110   B. 45   C. 90   D. 55

E. There is no output due to a run-time exception.

```
int x = 0;
for (int i=0,j=0;i<10;i+=1,j+=2)
  x += j;
out.println(x);
```

QUESTION 16

What is output by the code to the right?

A. true   B. 32   C. -32   D. -1   E. 1

```
out.println("chicken".compareTo(
  "Chicken"));
```

QUESTION 17

What is output by the code to the right?

A. `4032`   B. `1016`   C. `0`   D. `17`   E. `15`

```
out.println(252 >> 4);
```

QUESTION 18

What is output by the code to the right?

A. `Howdy9`   B. `7`

C. `9`   D. `Howdy7`

E. `6`

```
int i = 6;
if (++i > 3 || i++ < 9 && ++i == 7)
  out.print("Howdy");
out.println(i);
```

QUESTION 19

What is output by the code to the right?

A. `[9,5,4]`   B. `[9,4]`

C. `[2,9,4]`   D. `[2,9,5,4]`

E. There is no output due to a run-time exception.

```
ArrayList a = new ArrayList<>();
a.add(2);
a.add(9);
a.add(5);
a.add(4);
a.remove(2);
out.println(a);
```

QUESTION 20

What is output by the code to the right?

A. `0`   B. `2`   C. `8`   D. `13`   E. `4`

```
int x = 32;
x %= 13;
out.println(x % 4);
```

QUESTION 21

What is output by the code to the right?

A. `78`   B. `78910`

C. `789`   D. `7`

E. There is no output due to a run-time exception.

```
int x = 7;
do {
  out.print(x);
}
while (x > 9);
```

QUESTION 22

What is output by the code to the right?

A. `HiBye7`   B. `Bye4`

C. `Hi6`   D. `HiBye8`

E. `4`

```
int x = 4;
if (++x == 5 && x++ == 5)
  out.print("Hi");
if (x++ == 6 && ++x == 8)
  out.print("Bye");
out.println(x);
```

QUESTION 23

Which of the following is a valid call to the `howdy` method at right?

A. `howdy(1, 2.0, "Hi");`

B. `howdy(1, 2, "Hi");`

C. `howdy(1.0, 2.0, "Hi");`

D. A and B only

E. A, B, and C

```
public int howdy(int i,
                 double q,
                 String s)
{
  //implementation not shown
}
```

QUESTION 24

What is output by the code to the right?

A. `true`   B. `false`

C. `0`   D. `x`

E. There is no output due to a run-time exception.

```
boolean x = false;
out.println(x =! x);
```

QUESTION 25

What is output by the code to the right?

A. `HissRattleRattle`   B. `HissRattleHiss`

C. `RattleRattleHiss`   D. `HissHissHiss`

E. There is no output due to a syntax error.

QUESTION 26

Using the code to the right, which of the following instantiations would cause an error?

A. `Reptile w = new CottonMouth();`

B. `Rattler x = new Rattler();`

C. `Rattler y = new CottonMouth();`

D. `Snake z = new CottonMouth();`

E. All of the instantiations above are valid.

```java
interface Reptile{
  void talk();
}
class Snake implements Reptile {
  public void talk() {
     out.print("Hiss");
  }
}
class Rattler extends Snake {
  public void talk() {
     out.print("Rattle");
  }
}
class CottonMouth extends Snake {

}

///////////////////////////////
//// client code /////////////////
Reptile r = new Snake();
r.talk();
Reptile s = new Rattler();
s.talk();
Reptile c = new CottonMouth();
c.talk();
```

QUESTION 27

What is output by the code to the right?

A. `246810`   B. `12345678910`

C. `13579`   D. `2468`

E. There is no output due to a syntax error.

```java
int[] ray = {1,2,3,4,5,6,7,8,9,10};
for (int i=0; i<ray.length; i++) {
  out.print(ray[++i]);
}
```

QUESTION 28

What is output by the code to the right?

A. `[1,2,3,9,8,7]`   B. `[1,7,2,8,3,9]`

C. `[1,9,2,8,3,7]`   D. `[7,1,8,2,9,3]`

E. There is no output due to a run-time exception.

```java
int[] ray1 = {1,2,3};
int[] ray2 = {9,8,7};
ArrayList blah = new ArrayList<>();

for (int i=0; i<ray1.length; ++i)
{
  blah.add(ray1[i]);
  blah.add(ray2[ray2.length - i- 1]);
}
out.println(blah);
```

QUESTION 29

What is output by the code to the right?

A. 6

B. 22

C. 18

D. -6

E. There is no output due to a run-time exception.

```java
public class Something {
  public static int cnt = 0;
  public static int recur1(int x) {
    cnt += 2;
    if (x > 1)
      return recur2(x + 2);
    return x;
  }
  public static int recur2(int x) {
    cnt -= 3;
    if (x < 20)
      return recur1(x + 1);
    return x;
  }
}

////////////////////////////////
//// client code /////////////////
Something.recur1(5);
out.println(Something.cnt);
```

QUESTION 30

What is output by the code to the right?

A. 17   B. 51   C. 4   D. 34

E. There is no output due to a syntax error.

```java
class Something {
  public static int recur3(int x) {
    if (x % 17 == 0)
      return x;
    return recur3(x + 3);
  }
}

////////////////////////////////
//// client code /////////////////
out.println(Something.recur3(1));
```

QUESTION 31

What is output by the code to the right?

A. [5]   B. [1,4,1,5]

C. [1,4,5]   D. [5,1,4]

E. There is no output due to a syntax error.

QUESTION 32

What data structure could you have used instead of an `ArrayList` and the `addItMaybe` method to achieve the same result?

A. Deque   B. List

C. Queue   D. Set

E. Map

```java
public static ArrayList addItMaybe(
            int i, ArrayList lst)
{
  if (lst.indexOf(i) < 0)
    lst.add(i);
  return lst;
}

////////////////////////////////
//// client code /////////////////
ArrayList m = new ArrayList<>();
m = addItMaybe(1, m);
m = addItMaybe(4, m);
m = addItMaybe(1, m);
m = addItMaybe(5, m);
out.println(m);
```

QUESTION 33

What is output by the code to the right?

A. 70   B. 1110   C. 101   D. 1000110

E. There is no output due to a syntax error.

```java
int x = 0b111;
int y = 10;
out.println(x * y);
```

QUESTION 34

What is output by the code to the right?

A. truefalsefalse   B. truetruefalse

C. truefalsetrue   D. falsetruetrue

E. truetruetrue

```
public static boolean what(int i) {
  return (i & 1) == 1;
}

///////////////////////////////////
//// client code //////////////////
out.print(what(1));
out.print(what(27));
out.print(what(14));
```

QUESTION 35

Which of the following could replace (i & 1) == 1 in the what method to the right to achieve the same result?

A. (i % 2) == 0   B. i & (1 == 1)

C. (i > 1)   D. (i % 2) != 0

E. None of these are equivalent

QUESTION 36

What is output by the code to the right?

A. [1,17,24]   B. [24]

C. [1,17]   D. [1]

E. [17,24]

```
Queue q = new PriorityQueue();
q.add(1);
q.add(17);
q.add(24);
q.peek();
q.poll();
out.println(q);
```

QUESTION 37

What is output by the code to the right?

A. [1,24]   B. [24,19]

C. [19]   D. [1,24,19]

E. There is no output due to a run-time error.

```
Deque d = new LinkedList();
d.add(1);
d.addLast(24);
d.addLast(19);
d.element();
d.pop();
out.println(d);
```

QUESTION 38

Which of the following could replace **<**1**>** so that the code to the right would output a-b-c-d-e-f ?

A. \\s+,\\s+   B. \\s?,\\s?

C. \\s*,\\s*   D. \\s,\\s

E. \\s.,\\s.

```
String s = "a, b   , c,   d,e,f";
out.println(s.replaceAll("<**1**>",
  ", "));
```

QUESTION 39

What is output by the code to the right?

A. [Howdy]   B. [H, owdy]

C. [H, o, w, d, y]   D. [H, wdy]

E. There is no output due to a run-time error.

```
String[] ray =
  "Howdy".split("^[aeiou]");
out.println(Arrays.toString(ray));
```

QUESTION 40

What is output by the code to the right?

A. 8   B. 1   C. 4   D. 2   E. 6

```
String s = "Facebook";
String[] ray;
ray = s.split("\\p{XDigit}");
out.println(ray.length);
```