Note: Correct responses are based on Java, J2sdk v 5.0, 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.

QUESTION 1

$1001_2 - 0001_2 = ?$

A. 1001_2 B. 64_{10} C. 16_{10} D. 10_8 E. 1010_2

QUESTION 2

What is output by the code to the right?

A. 0 B. -1 C. 4 D. a E. b

```
int a=-1;
int b=4;
a=b;
out.println(a);
```

QUESTION 3

What is output by the code to the right?

A. c B. 0 C. 0.0 D. 8.3 E. 8.4

```
double c=0;
c+=8.3;
out.println(c);
```

QUESTION 4

What is output by the code to the right?

A. 3.0 B. 4.0 C. 5.0 D. 4 E. 3

```
double d = Math.min(3,5);
d = Math.min(d,4);
out.println(d);
```

QUESTION 5

What is output by the code to the right?

A. 32 B. 2 C. 3 D. 2.1 E. 0

```
int e = 8*4/3-2*4;
out.println(e);
```

QUESTION 6

What is output by the code to the right?

A. shoots B. ladders C. ladder D. and E. shoot

```
String f = "shootsandladders";
f=f.substring(0,f.indexOf('t')+1);
out.println(f);
```

QUESTION 7

What is output by the code to the right?

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

```
String g = "state";
String h = "utah";
out.println(g.compareTo(h));
```

QUESTION 8

What is output by the code to the right?

A. 65 B. 32 C. 97 D. 48 E. 0

```
int i='a';
i/=2;
out.println(i);
```

QUESTION 9

What is output by the code to the right?

A. -3 B. 0 C. -2 D. 1 E. 0

```
int j=9;
while(j>-2)
  j-=3;
  out.println(j);
```

QUESTION 10

What is output by the code to the right?

A. 0 B. 4 C. 12 D. 5 E. 8

```
int[] k = new int[5];
int[] m = k;
m[2] = 4;
m[7/2] = 8;
out.println(k[2] + m[3]);
```

QUESTION 11

What is the ***last*** value output by the code to the right ?

A. 7.5 B. 9.0 C. 10.5 D. 12.0 E. 13.5

```
for(double p=0; p<12.75; p+=1.5)
   out.println(p);
```

QUESTION 12

What is output by the code to the right?

A. 0 B. 1 C. false D. true E. n

```
boolean n=false;
boolean o=true;
out.println((!(n||o)||o&&(n||o)));
```

QUESTION 13

What is output by the code to the right?

A. 12 B. 20 C. 17 D. 19 E. 23

```
int q=17;
int r=23;
out.println(q|r&q&r);
```

QUESTION 14

What correctly replaces **<*1>** in the code to the right ?

A. int B. byte C. Byte

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

```
ArrayList<  <*1>  > aList;
aList = new ArrayList<  <*1>    >();
```

QUESTION 15

What replaces **<*1>** in the code to the right so method test will return true if parameter x is at least five times as large as parameter y?

A. return x*y>5;
B. return x>y*5;
C. return x>=y*5;
D. return y>=x/5;
E. more than one of these

```
public boolean test(double x, int y)
{
   <*1>
}
```

QUESTION 16

What is output by the code to the right?

A. 0 B. 1 C. false D. true E. n

```
boolean s=true;
boolean t=true;
out.println((!(s&&t)||s^(t||s)));
```

QUESTION 17

What is output by the code to the right?

A. 9.14 B. 9.1 C. 9.1234 D. 9.12 E. 9.13

```
double u = 9.1234f;
String v = String.format("%.2f",u);
out.println(v);
```

QUESTION 18

What is the output of // line 1?

A. [8.2, 9.0, 1.0]
B. [9.0, 1.0]
C. [8.2, 9.0]
D. [1.0, 9.0]
E. [1.0, 9.0, 8.2]

QUESTION 19

What is the output of // line 2?

A. 0.0
B. 1.0
C. 9.0
D. 8.2
E. syntax error

```
Stack<Double> w;
w = new Stack<Double>();
w.add(8.2);
w.push(9.0);
w.add(1.0);
out.println(w);              // line 1
w.pop();
w.pop();
out.println(w.peek());       // line 2
```

QUESTION 20

Which of the following is a subinterface of Collection?

A. Map B. TreeSet C. Stack D. Queue E. more than one of these

QUESTION 21

Which of the following does ***not*** implement the `Comparable` interface?

A. `Byte` B. `Boolean` C. `String` D. `Float` E. `StringBuffer`

QUESTION 22

What is output by the code to the right?

A. `0` B. `1` C. `true` D. `false` E. error

```
Long x;
x = new Long("093");
Long y;
y = new Long("091");
out.println(x.compareTo(y));
```

QUESTION 23

What correctly replaces **`<*1>`** in the code to the right so all elements of `chop` are inspected?

A. `chop.nextInt()` B. `chop.next()`

C. `chop.hasNextInt()` D. `chop.hasNextUn()`

E. `chop`

QUESTION 24

Assume **`<*1>`** was filled correctly. What is output by the code to the right?

A. `4` B. `10` C. `11` D. `9` E. `6`

```
String toChop = "1+2-3+4";
Scanner chop = new Scanner(toChop);
chop.useDelimiter("[+-]");
int sum=0;
while(  <*1>   )
{
   sum=sum+chop.nextInt();
}
out.println(sum);
```

QUESTION 25

What is the output of `// line 1`?

A. `3` B. `5` C. `9` D. `1` E. `0`

QUESTION 26

What is the output of `// line 2`?

A. `3` B. `5` C. `9` D. `1` E. `0`

```
Queue<Integer> theQ;
theQ = new PriorityQueue<Integer>();
theQ.add(3);
theQ.add(5);
theQ.add(1);
theQ.add(9);
out.println(theQ.remove()); // line 1
theQ.add(0);
out.println(theQ.remove()); // line 2
```

QUESTION 27

What is the output of `// line 1`?

A. `jump shot` B. `power play` C. `dunk`

D. `free throw` E. `field goal`

QUESTION 28

What is the output of `// line 2`?

A. `touchdown` B. `power play` C. `null`

D. `jump shot` E. `field goal`

QUESTION 29

What is the output of `// line 3`?

A. `3` B. `4` C. `5` D. `6` E. `7`

```
Map<Integer, String> sports;
sports = new TreeMap<Integer, String>();
sports.put(3,"field goal");
sports.put(7,"touchdown");
sports.put(2,"dunk");
sports.put(2,"power play");
sports.put(1,"extra point");
sports.put(1,"free throw");
sports.put(2,"jump shot");

out.println(sports.get(2));   // line 1

out.println(sports.get(5));   // line 2

out.println(sports.size());   // line 3
```

QUESTION 30

Assuming a binary search tree has 3 levels, what is the minimum number of leaves that it could have?

A. `0` B. `1` C. `2` D. `3` E. `4`

QUESTION 31

Which of the following methods is called when attempting to insert a new `Object` into a `HashSet`?

A. `hashValue()` B. `sameAs()` C. `equals()` D. `compare()` E. more than one of these

QUESTION 32

What replaces **<*1>** in the code to the right so that method `isWhat` will run as efficiently as possible?

A. `i<Math.sqrt(num)`

B. `i<num`

C. `i<=Math.sqrt(num)`

D. A and B only

E. A,B, and C

QUESTION 33

What is method `isWhat` trying to determine about `num`?

A. is num an even number

B. is num an odd number

C. is num a perfect number

D. is num a prime number

E. is num a psuedo random number

QUESTION 34

What is the runtime efficiency of `isWhat`? Choose the most restrictive correct answer.

A. $O(N)$

B. $O(N^2)$

C. $O(\log_2 N)$

D. $O(N)*O(\log_2 N)$

E. $O(N^2)*O(\log_2 N)$

QUESTION 35

Assume **<*1>** was filled correctly. What is the output of `//line 1`?

A. `11 is not something`

B. `11 is something`

C. `11 something.`

D. `11 not something.`

E. syntax error

```
class What
{
  private int num;

  public What(int n)
  {
    setNum(n);
  }

  public void setNum(int n)
  {
    num=n;
  }

  public boolean isWhat()
  {
    boolean check = true;
    for(int i=2;   <*1>   ;i++){
       if(num%i == 0)
          return false;
     }
    return true;
  }

  public String toString()
  {
    if(isWhat())
       return ""+num+" is something.";
    else
       return ""+num+" is not something.";
  }
}

//test code in the main of another class

What runner = new What(11);
out.println(runner);     //line 1
```

QUESTION 36

What replaces **<*1>** in the code to the right so the default `Matrix` constructor would be complete?

A. `mat = new int[][];`

B. `mat = new int[0][];`

C. `mat = new int[][0];`

D. `mat = new int[0];`

E. more than one of these

QUESTION 37

What replaces **<*2>** in the code to the right so the `Matrix` initialization constructor would be complete?

A. `mat = new int[rows][cols];`

B. `mat = new int[c][rows];`

C. `mat = new int[r][c];`

D. A and B

E. A, B, and C

QUESTION 38

What replaces **<*3>** in the code to the right so that the size of `one` and the size of the receiving row of `mat` will be the same?

A. `setRowSize(r,one.length());`

B. `setRowSize(r,one.size());`

C. `setRowSize(r,one.length);`

D. `setRowSize(one.size(),r);`

E. `setRowSize(one.length,r);`

QUESTION 39

What replaces **<*4>** in the code to the right so that the `for` loop would correctly access all rows in `mat`?

A. `int row : mat`

B. `int[] row : mat[][]`

C. `int[] row : mat[r]`

D. `int[] row : mat[r][c]`

E. `int[] row : mat`

QUESTION 40

Assume all blanks have been filled correctly. After executing `//line 1`, how many rows does instance variable `mat` contain?

A. 3 B. 6

C. 0 D. 2

E. 4

```
class Matrix
{
   private int[][] mat;

   public Matrix() {
      <*1>
   }
   public Matrix(int rows, int cols){
      <*2>
   }

   public void setRowSize(int r, int size)
   {
     mat[r]=new int[size];
   }

   public void setRow(int r, int[] one)
   {
      <*3>
      for(int i=0; i<one.length; i++)
        mat[r][i]=one[i];
   }

   public String toString()
   {
     String output = "";
     for(  <*4>  ){
       for(int spot : row)
         output+=spot;
       output+="\n";
     }
     return output;
   }
}


//test code in the main of another class

Matrix demo = new Matrix(2,11);   //line 1
```