Note: Correct responses are based on Java, J2sdk v 6.0, 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

What is 11_9 plus 36_7 ?

A. 53_7 B. 51_7 C. 45_8 D. 46_8 E. 101100_2

QUESTION 2

What is output by the code to the right?

A. `1.0` B. `10.0` C. `5.0` D. `8.0`

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

```
double a = '2';
a = a / 5;
System.out.println(a);
```

QUESTION 3

What is output by the code to the right?

A. `2` B. `30` C. `25` D. `100`

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

```
int b = 31;
b = b - 25 % 4;
System.out.println(b);
```

QUESTION 4

What is output by the code to the right?

A. `-327` B. `2712` C. `-37` D. `327` E. `-32712`

```
for(int c=-3; c<9; c=c+5)
   System.out.print(c);
```

QUESTION 5

What is output by the code to the right?

A. `0` B. `-1` C. `true` D. `false` E. `no`

```
String d = "cs_is_fun_it_is";
System.out.print(d.endsWith("_is"));
```

QUESTION 6

What is output by the code to the right?

A. `4` B. `20` C. `2` D. `10` E. `21`

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

QUESTION 7

What is output by the code to the right?

A. `yes` B. `no`

C. `maybe` D. `true`

E. `false`

```
boolean sam = false;
boolean ben = true;
ben = !sam;
sam = !ben && !sam;
System.out.println(sam);
```

QUESTION 8

What is output by the code to the right?

A. `0123`

B. `03`

C. `123`

D. `012`

E. `23`

```
int theNum = 12;
if(theNum > 12)
  System.out.print(0);
else{
  if(theNum < 12){
    System.out.print(1);
  }
  else{
    System.out.print(2);
  }
}
System.out.print(3);
```

QUESTION 9

Which of the following could replace **<*1>** in the code of class `Halloween` to the right so that method `addMore` would double the value of `howMuchCandy`?

A. `howMuchCandy *= 3;`

B. `howMuchCandy = howMuchCandy * 3;`

C. `howMuchCandy = howMuchCandy + howMuchCandy;`

D. A and B only.

E. A, B, and C.

```
public class Halloween
{
  private double howMuchCandy;

  public Halloween(double hm){
    howMuchCandy = hm;
  }

  public void addMore(){
    <*1>
  }

  public double getHowMuchCandy(){
    return howMuchCandy;
  }
}

////////////////////////////////////////
//client code
Halloween hall = new Halloween(50);
hall.addMore();
out.println(hall.getHowMuchCandy());   //1
```

QUESTION 10

Assuming that **<*1>** is filled correctly, what is output by the line marked `//1` in the code to the right?

A. `100`

B. `150`

C. `100.0`

D. `50.0`

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

QUESTION 11

What is output by the code to the right?

A. `2` B. `3` C. `3.0` D. `2.0` E. `2.4`

```
System.out.println(Math.cbrt(8.0));
```

QUESTION 12

What is output by the code to the right?

A. `d456` B. `456` C. `d` D. `500` E. `400`

```
System.out.printf("%d",456);
```

QUESTION 13

What is output by the code to the right?

A. `_` B. `b` C. `p` D. `null`
E. There is no output due to a null pointer exception.

```
String[][] sMat = new String[3][3];
sMat[0][0] = "pig";
sMat[1][1] = "bug";
out.println(sMat[2][2].charAt(1));
```

QUESTION 14

What is output by the line marked `//1` in the client code to the right?

A. `15`

B. `22`

C. `14`

D. `8`

E. `13`

```
public static int doIt(String[] words)
{
  int cnt = 0;
  for(String s : words)
  {
    String vowels = "aeiou";
    if(vowels.indexOf(s)==-1)
      cnt++;
  }
  return cnt;
}

////////////////////////////////////////
//client code
String toks = "frogbugpigcatbugcanada";
String[] stuff = toks.split("");
out.println(doIt(stuff));   //1
```

QUESTION 15

What is output by the code to the right?

A. ita B. tal C. all D. nit E. win

```
String j = "workhardandwinitall";
System.out.print(j.substring(14,17));
```

QUESTION 16

What is output by the code to the right?

A. 847 B. 19 C. 127 D. 8+4+7

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

```
System.out.print("8"+"4"+"7");
```

QUESTION 17

What is output by the code to the right?

A. 19 B. 19.5 C. 29 D. 35 E. 35.5

```
out.println(7 * 5 - 3 + 6 / 2);
```

QUESTION 18

What is output by the code to the right?

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

```
boolean k=false, m=true, p=true;
System.out.println(k ^ (m && p));
```

QUESTION 19

What is output by the code to the right?

A. [9, 2, 6, 8, 3, 1, 0, 7]

B. [9, 2, 1, 8, 3, 1, 0, 2]

C. [9, 2, 6, 3, 3, 1, 0, 7]

D. [9, 2, 1, 8, 3]

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

```
Integer[] z = {9,2,6,8,3,1,0,7};
List iList = Arrays.asList(z);
ArrayList<Integer> n;
n = new ArrayList<Integer>(iList);

for(int fun : n)
  if(fun>3 && fun<8)
    n.add(n.size(),fun-5);
System.out.println(n);
```

QUESTION 20

What is output by the code to the right?

A. 0 B. 4.0 C. 2.0 D. -4 E. -4.0

```
double dbl = Math.abs(-21)-17;
System.out.println(dbl);
```

QUESTION 21

What is output by the code to the right?

A. 2

B. 4

C. 1

D. 8

E. 7

```
int frog = 7;
switch(frog)
{
  case 2 : frog = 1;
  case 3 : frog = 2;
  case 4 : frog = 4;
  case 5 : frog = 8;
}
System.out.println(frog);
```

QUESTION 22

What is returned by the method call `what(new int[]{6,6,5,7,6,8,6,9,6})` ?

A. 3 B. 6 C. 5 D. 7 E. 2

QUESTION 23

What is returned by the method call `what(new int[]{0,1,5,2,2,1,9,2})` ?

A. 3 B. 6 C. 5 D. 7 E. 2

```
public static int what(int[] x)
{
  int count=0;

  int old = x[x.length/2];

  for(int it : x)
  {
    if(it==old)
      ++count;
  }

  return count;
}
```

QUESTION 24

What is output by the line marked `//1` in the client code to the right?

A. `[9, 6, 4, 6, 5]`

B. `[1, 2, 0, 0, 0]`

C. `[0, 0, 0, 0]`

D. `[3, 5, 4, 6, 5]`

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

QUESTION 25

What is output by the line marked `//2` in the client code to the right?

A. `[9, 6, 4, 6, 5]`

B. `[1, 2, 0, 0, 0]`

C. `[0, 0, 0, 0]`

D. `[3, 5, 4, 6, 5]`

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

QUESTION 26

What is output by the line marked `//3` in the client code to the right?

A. `[9, 6, 4, 6, 5]`

B. `[1, 2, 0, 0, 0]`

C. `[0, 0, 0, 0]`

D. `[3, 5, 4, 6, 5]`

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

```
public class UpGoRun
{
   public static void up(int[] a){
      a[0] = 3;
      a[1] = 5;
   }

   public static void go(int[] b){
      b = new int[5];
      b[0] = 1;
      b[1] = 2;
   }

   public static void run(int[] c){
      c[1] = 6;
      c[2] = 4;
      c =  new int[4];
   }
}

////////////////////////////////////////
//client code
int[] br = {9,8,7,6,5};

UpGoRun.run(br);
out.println(Arrays.toString(br));    //1

UpGoRun.go(br);
out.println(Arrays.toString(br));    //2

UpGoRun.up(br);
out.println(Arrays.toString(br));    //3
```

QUESTION 27

What is output by the line marked `//1` in the client code to the right?

A. `3` B. `2`

C. `5` D. `7`

E. `8`

QUESTION 28

What is output by the line marked `//2` in the client code to the right?

A. `3` B. `2`

C. `5` D. `7`

E. `8`

```
String whoot = "/3//2//5/1/6/8";
String[] sRay = whoot.split("//*");

out.println(Arrays.toString(sRay));
out.println(sRay[3]);       //1
out.println(sRay.length);   //2
```

QUESTION 29

What is returned by the method call `wow(7)` ?

A. `25` B. `-40` C. `-26` D. `21` E. `31`

QUESTION 30

What is returned by the method call `wow(8)` ?

A. `25` B. `-40` C. `-26` D. `21` E. `31`

```
public static int wow(int x)
{
  if(x<=0)
    return 1;
  else
    return x + x + wow(x-3);
}
```

QUESTION 31

What is output by the code to the right?

A. `+45` B. `+0045`

C. `+05d45` D. `+00045`

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

```
System.out.printf("%+05d",45);
```

QUESTION 32

What is output by the code to the right?

A. `0` B. `1`

C. `15` D. `21`

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

```
String ghost = "goulsandgoblins";
Integer witch = ghost.indexOf('g');
witch *= ghost.length();
System.out.println(witch);
```

QUESTION 33

Which of the following method names could replace **`<*1>`** in the code to the right to correctly call a method of interface Queue that would place a new item at the end of the queue `q`?

A. `add` B. `push`

C. `offer` D. A and B only

E. A and C only

QUESTION 34

What is output by the line marked `//1` in the code to the right?

A. `8` B. `7` C. `4` D. `2` E. `6`

QUESTION 35

What is output by the line marked `//2` in the code to the right?

A. `8` B. `7` C. `4` D. `2` E. `6`

```
Map<String, Integer> map;
map = new TreeMap<String, Integer>();

Queue<Integer> q;
q = new LinkedList<Integer>();

map.put("truck", 4);
map.put("boat", 7);
map.put("plane", 8);
map.put("truck", 2);
map.put("boat", 6);


for(String sym : map.keySet())
   q.  <*1> (map.get(sym));

Iterator<Integer> it = q.iterator();
out.println(it.next());          //1
out.println(it.next());          //2
```

QUESTION 36

Which sorting algorithm does method `sort` implement?

A. merge sort

B. selection sort

C. insertion sort

D. heap sort

E. quick sort

QUESTION 37

What is the running time of method `sort`? Choose the most restrictive correct answer?

A. O(N)

B. $O(N^2)$

C. O(NlogN)

D. O(1)

E. the running time cannot be determined

```
public void swap(int[] d, int i, int j){
  int tmp = d[i];
  d[i] = d[j];
  d[j] = tmp;
}

public void sort(int[] d){
  int i = 1, j = 0, tmp = 0;
  boolean fin = false;

  while( i < d.length ){
    tmp = d[i];
    j = i;
    fin = tmp <= d[j-1];

    while( !fin ){
      swap(d, j, j-1);
      j--;
      fin = j==0 || tmp <= d[j-1];
    }
    i++;
  }
}
```

QUESTION 38

Assume that method `superSort(Object[] objs)` is $O(N^3)$ where N = `obj.length`. When method `superSort` is passed an Object array of length 10000 it takes 0.20 seconds for method `superSort` to complete. If method `superSort` is passed an Object array of length 20000, how many seconds would it take `superSort` to complete?

A. 0.10

B. 0.40

C. 0.60

D. 0.80

E. 1.60

QUESTION 39

What is output by the line marked `//1` in the client code to the right?

A. `3`

B. `5`

C. `4`

D. `2`

E. There is no output due to a `NullPointerException`.

QUESTION 40

What is output by the line marked `//2` in the client code to the right?

A. `3`

B. `5`

C. `4`

D. `2`

E. There is no output due to a `NullPointerException`.

```
public class Hook
{
   private Object store;
   private Hook next;
   private Hook prev;

   public Hook(Object s, Hook n, Hook p){
      store = s;
      next = n;
      prev = p;
   }

   public void setNext(Hook n){
      next = n;
   }

   public void setPrev(Hook p){
      prev = p;
   }

   public Object getStore(){
      return store;
   }

   public Hook getNext(){
      return next;
   }

   public Hook getPrev(){
      return prev;
   }
}

//////////////////////////////////////////
//client code
Hook hook1 = new Hook(4, null, null);
Hook hook2 = new Hook(3, hook1, null);
hook1.setPrev(hook2);
Hook hook3 = new Hook(2, hook2, null);
hook2.setPrev(hook3);
Hook hook4 = new Hook(1, hook3, null);
hook3.setPrev(hook4);

Hook what = hook4.getNext().getNext();
System.out.println(what.getStore());  //1
what = what.getPrev().getNext().getPrev();
System.out.println(what.getStore());  //2
```