Note: Correct responses are based on Java, J2sdk v 7.0, 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 10010010_2 plus 1101_2 ?

A. 25_{10} B. 10101111_2 C. 916_{10} D. $9F_{16}$ E. 157_{10}

QUESTION 2

What is output by the code at right?

A. 41   B. 26   C. 42   D. 16   E. 1

```
int a = 24, b = 16;
b = b + a / b + a;
out.println(b);
```

QUESTION 3

What is output by the code at right?

A. 38   B. 800   C. 900   D. 56   E. 40

```
int y = 20, z = 16;
z += 2 * y;
out.println(z);
```

QUESTION 4

What is output by the code at right?

A. 50   B. 61   C. 70   D. 40   E. 79

```
int x = 10;
for(int i = 4; i > -1; i--)
  x += 10 - i;
System.out.println(x);
```

QUESTION 5

What is output by the code at right?

A. ime of the Cen

B. ime of the Cent

C. rime of the Cen

D. rime of the Ce

E. ime of the Ce

```
String song = "Crime of the Century";
song = song.substring(2,15);
System.out.println(song);
```

QUESTION 6

What is output by the code at right?

A. 1.6   B. 50.1   C. 2.1   D. 38.2

E. There is no output due to runtime error

```
int n[] = {4,3,2,1,0};
double k[]= {2.1,1.6,37.4,38.2,50.1};
out.println(k[n[1]]);
```

QUESTION 7

When is the variable c false?

A. when a is false and b is true

B. when a is true and b is true

C. when a is true

D. when b is false

E. c is never false

```
boolean a,b,c;
a = true;
b = false;
c = (a|b) & a & b | !a & b & (!a|!b);
out.println(c);
```

QUESTION 8

What is output by the code at right?

A. HOU   B. LAHOU

C. HOUOAK   D. LAHOUOAK

E. There is no output due to a syntax error

```
String team = "Astros";
switch(team) {
  case "Angels"  : out.print("LA");
  case "Astros"  : out.print("HOU");
  case "A's"     : out.print("OAK");
                       break;
  case "Rangers" : out.print("TX");
                       break;
  case "Mariners": out.print("SEA");
  default        : out.print("OTH");
}
```

QUESTION 9

What is NOT a possible output?

A. 5   B. 6   C. 0   D. 3   E. 1

```
out.print((int)(Math.random()*6));
```

QUESTION 10

Which line(s) of code will change the note from an F sharp to an F flat?

A. n.makeFlat();

B. n.makeSharp(false);

C. n.isFlat = true;
   n.isSharp = false;

D. n = new Note('F',false,true);

E. n.makeFlat(n.makeSharp());

```
class Note {
  private char tone;
  private boolean isSharp, isFlat;

  public Note(char tone)
  {
     this.tone = tone;
     isSharp = isFlat = false;
  }

  public void makeFlat()
  {
     isFlat = true;
     isSharp = false;
  }

  public void makeSharp()
  {
     isFlat = false;
     isSharp = true;
  }
}

/////////CLIENT CODE/////////
Note n = new Note('F');
```

QUESTION 11

What is output by the code at right?

A. 4.0   B. 256.0

C. 4   D. 16.0

E. 256

```
out.println(Math.sqrt(16));
```

QUESTION 12

What is output by the code at right? (- is a space)

A. `56.2800012`

B. `56.28ace00012`

C. `--56.29ace00012`

D. `56.29ace---12`

E. `--56.28ace---12`

```
int s = 12;
double t = 56.2845;
out.printf("%4.2face%05d",t,s);
```

QUESTION 13

What is output by the code at right?

A. `131CDE`

B. `195CDE`

C. `131CD69`

D. `131CD101`

E. `ABCDE`

```
out.println('A'+'B'+"CD"+'E');
```

QUESTION 14

What is output by the code at right?

A. `79`   B. `52`   C. `27`   D. `28`   E. `47`

```
int k = 5;
int x[][] = new int[10][10];
for(int i=0; i<10; i++)
  for(int j=0; j<10; j++)
    x[i][j] = k++;
out.println(x[4][7]);
```

QUESTION 15

What is output by the code at right?

A. `100`   B. `52`

C. `-200`   D. `-150`

E. `300`

```
int jp = 50;
for(int i=1; i<25; i++)
{
  if (i%5==0)
    jp+=i;
  jp-=i;
}
out.println(jp);
```

QUESTION 16

What is the best code to get the value of 26 from `String x = "prog26:java"`?

A. `int value = Integer.parseInt(x.substring(5,7));`

B. `int value = x.substring(4,x.indexOf(":"));`

C. `int value = Integer.parseInt(x.substring(4,x.indexOf(":")));`

D. `int value = x.substring(5,x.indexOf(":"));`

E. `int value = Integer.parseInt(x.substring(5,x.indexOf(":")));`

QUESTION 17

What is output by the code at right?

A. `245`   B. `0`   C. `247`   D. `244`

E. `11110101`

```
out.println(181 | 64);
```

QUESTION 18

When would `d` be true?

A. `a = true; b = true; c = true;`

B. `a = true; b = false; c = true;`

C. `d` can never be true

D. `a = false; b = false; c = false;`

E. `a = true; b = true; c = false;`

```
boolean a,b,c,d;
d =(a && b || a && c) && a && b && c;
```

QUESTION 19

What is output by the code at right?

A. 20 B. 16

C. 40 D. 38

E. 18

```
ArrayList<Integer> x;
x = new ArrayList<Integer>();
for(int i=1; i<=40; i+=2)
  x.add(i);
x.remove(2);
x.add(x.remove(11));
x.remove(17);
x.add(x.size()-1,x.remove(15));
out.println(x.size());
```

QUESTION 20

What is output by the code at right?

A. 3.3335 B. 803.35 C. 10 D. 803 E. 3

```
int tom = 2410;
int jerry = tom % 50;
out.println(jerry / 3);
```

QUESTION 21

What could be the output of the code to the right?

    I. 99 II. 100 III. 101

A. II only

B. II and III

C. I only

D. III only

E. I, II, and III

```
Scanner in = new Scanner(System.in);
int x = 0;
do
{
  x+=in.nextInt();
}while(x<100);
out.println(x);
```

QUESTION 22

What is returned by the method call `kapow("Doctor Who")`?

A. +

B. o

C. c

D. D

E. r

```
public static char kapow(String word)
{
  while (word.length() > 0)
  {
    int size = word.length();
    char s = word.charAt(0);
    char e = word.charAt(size-1);
    char m = word.charAt(size/2);
    if(s - e == 0)
      return s;
    else if(s - m == 0)
      return e;
    else if(e - m == 0)
      return s;
    word = word.substring(1);
  }
  return '+';
}
```

QUESTION 23

What is returned by the method call `kapow("daleks")`?

A. d

B. k

C. a

D. s

E. +

QUESTION 24

Which of the following correctly replaces `< *1>` in the code to the right such that `Ninja` properly extends `Warrior`?

A. `super();`

B. `Warrior(d,s);`

C. `super(d,s);`

D. `Warrior();`

E. `new Warrior(d,s);`

QUESTION 25

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

A. 11

B. 5

C. 41

D. -2

E. 18

QUESTION 26

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

A. 41

B. 18

C. -1

D. 11

E. 5

```
class Warrior
{
  private int dex;
  private int str;

  public Warrior(int d, int s)
  {
     dex = d;
     str = s;
  }

  public int attack()
  {
     return str*2;
  }

  public int defense()
  {
     return dex*3;
  }

  public int damage(int s)
  {
     return s-defense();
  }
}

class Ninja extends Warrior
{
  private int speed;

  public Ninja(int d, int s)
  {
     <*1>
  }

  public int attack()
  {
  return super.attack()+defense()*3;
  }
}


/////////////////////////////////
////////CLIENT CODE/////////
Warrior conan = new Warrior(5,15);
Warrior ryoko = new Ninja(4,10);

int hit;
hit = ryoko.damage(conan.attack());
out.println(hit);      //line 1

hit = conan.damage(ryoko.attack());
out.println(hit);      //line 2
```

QUESTION 27

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

A. 6

B. 4

C. 7

D. 5

E. 3

QUESTION 28

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

A. [16, 8, 5, 9, 0, 0, 0]

B. [5, 8, 9, 16, 0, 0, 0]

C. [16, 8, 5, 9]

D. [5, 8, 9, 16]

E. [9, 8, 16, 5, 0]

```
int[] list = {16,8,5,9,8,16,5};
for(int i = 0; i<list.length; i++)
  for(int j=i+1; j<list.length; j++)
    if(list[i]==list[j])
      list[j]=0;


out.println(list.length);  //line 1

String s;
s = Arrays.toString(list);
out.println( s );          //line 2
```

QUESTION 29

What is returned by the method call `mystery(23)`?

A. 4   B. 10111

C. 23   D. 11101

E. 01011

QUESTION 30

What is returned by the method call `mystery(164)`?

A. 164   B. 100101

C. 3   D. 00100101

E. 10100100

```
public static String mystery(int x)
{
   if(x > 0)
      return mystery(x/2)+x%2;
   return "";
}
```
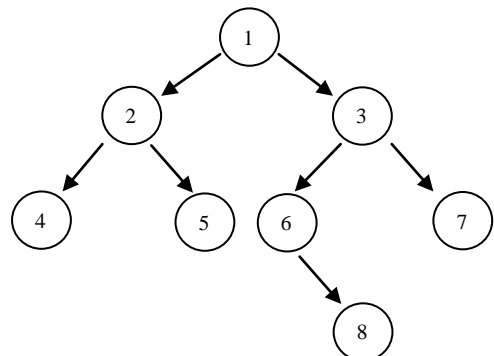
QUESTION 31

Given that a method has a running time of $O(n^2)$, where n is equal to the size of data being used. The method took 20 seconds when it was run with n = 50,000. What is the expected time for the method to run when n = 10,000.

A. 40 seconds

B. 0.8 seconds

C. 0.4 seconds

D. 4 seconds

E. 8 seconds

QUESTION 32

What would be printed out if a post-order traversal is used?

A. 1 2 3 4 5 6 7 8

B. 1 2 4 5 3 6 8 7

C. 4 2 5 1 6 8 3 7

D. 4 5 2 8 6 7 3 1

E. 8 6 7 3 1 5 2 4

QUESTION 33

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

A. `[Batman, Nightwing, Robin]`

B. `[Batgirl, Batman, Batwing, Nightwing, Robin]`

C. `[Batman, Robin]`

D. `[Batman, Batgirl, Nightwing, Robin, Batwing]`

E. `[Robin, Nightwing, Batwing, Batgirl, Batman]`

QUESTION 34

Which of the following correctly replaces `<*2>` in the code to the right?

A. `set.iterator()`

B. `new Iterator();`

C. `0`

D. `set.iterator<String>();`

E. `new Iterator<String>();`

QUESTION 35

Assuming `<*2>` is filled correctly, what is output by `//line 2` in the code at right?

A. `[Batgirl, Batman, Robin]`

B. `[Batman, Batgirl, Joker, Robin, Joker]`

C. `[Batman, Batgirl, Robin, Joker, Joker]`

D. `[Batgirl, Batman, Joker, Joker, Robin]`

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

```
TreeSet<String> set;
set = new TreeSet<String>();

set.add("Batman");
set.add("Batgirl");
set.add("Nightwing");
set.add("Robin");
set.add("Batwing");
out.println(set);      //line 1

Iterator<String> iter = <*2>
while(iter.hasNext())
{
  if(iter.next().contains("wing"))
     iter.remove();
  set.add("Joker");
}
out.println(set);      //line 2
```

QUESTION 36

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

A. `11`

B. `13`

C. `45`

D. `47`

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

QUESTION 37

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

A. `[20, 20, 30, 45, 47, 49]`

B. `[10, 13, 20, 20, 30, 45]`

C. `[20, 45, 20, 47, 49, 30]`

D. `[20, 20, 13, 49, 10, 30]`

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

```
PriorityQueue<Integer> q;
q = new PriorityQueue<Integer>();
q.add(45);
q.add(47);
q.add(11);
q.add(20);
q.add(20);
q.add(13);
out.println(q.remove());  //line 1

q.add(49);
q.remove();
q.add(10);
q.remove();
q.add(30);
out.println(q);  //line 2
```

QUESTION 38

What is output by the code at right?

A. 360

B. 5

C. 101101000

D. 101

E. 4

```
out.println(45 << 3);
```

QUESTION 39

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

A. twgqzjg

B. twqzj

C. yjjhntw

D. gg

E. yjjhngtwg

QUESTION 40

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

A. [g, g, g]

B. [qzjg, twg, yjjhng, yyg]

C. ["", qzjg, twg, yjjhng, yyg]

D. [qzj, tw, yjjhn, yy]

E. ["", qzj, tw, yjjhn, yy]

```
String x = "qzjgtwgyjjhngyy";
String[] list = x.split("g");

String s = list[2] + list[1];
out.println( s );       //line 1

s = Arrays.toString(list);
out.println( s );       //line 2
```