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 $7D_{16}$ plus 11_2 ?

A. $7F_{16}$ B. 126_{10} C. 10000010_2 D. $8E_{16}$ E. 80_{16}

QUESTION 2

What is output by the code to the right?

A. 5 B. 4 C. 1 D. 2 E. 0

```
int k = 32;
k = --k%6;
out.println(k);
```

QUESTION 3

What is a possible output by the code to the right?

A. 39.59 B. -2.97 C. 32.38 D. -10.75 E. 25.49

```
Double x = Math.random();
x*=36-10;
out.println(x);
```

QUESTION 4

What is output by the code to the right?

A. k917 B. kkkkkkkk0

C. kk100 D. 2752

E. kkkk32

```
int x = 2752;
do
{
  x/=3;
  out.print("k");
}while(x%2 != 0);
out.println(x);
```

QUESTION 5

What is output by the code to the right?

A. JetJetSwatt B. J.Jet C. JetJ.Swatt

D. J.JetSwatt E. There is no output due to a runtime error.

```
String str;
str="J.J.Swatt";
str=str.replace(".","et");
System.out.println(str);
```

QUESTION 6

What is output by the code to the right?

A. 16 B. 4 C. 0

D. 7 E. -20

```
int[] list = {27, 40, 31, 5, 1, 15};
for(int i=1; i<20; i++)
   list[i%list.length]-=i;
out.println(list[1]);
```

QUESTION 7

In order for team a to win the championship, team a must win, team b must lose, team c must lose, and team d must win. Team a is playing team b. Assume a, b, c, and d are boolean values and `true` denotes a win for that team. Which of the following lines of code give the best solution for team a to win the championship?

A. `if(a && !c && d)`

B. `if(a && !b && c && !d)`

C. `if(a != b && d != c)`

D. `if(a == true)`

E. `if(a == d && b == c)`

QUESTION 8

What is output by the code to the right, given the value of <*1>?

	<*1>	Output
A.	31	Group B
B.	40	Group A
C.	17	Group C
D.	5	Group D
E.	26	Group E

```
int team = <*1>;
String x;
switch(team/5)
{
   case 0: x = "Group A";
   case 1: x = "Group B";
   case 2: x = "Group C";
   case 4: x = "Group D";
   default: x = "Group E";
}
out.println(x);
```

QUESTION 9

A card game is scored by adding together all the card values in a player's hand and subtracting 20 from the total, then a multiplier is applied to the result to find the final score. Which of the following lines of code yields the best solution?

A. `score = mult * (20 + total);`

B. `score = total * mult - 20;`

C. `score = total - 20 * mult;`

D. `score = (20 - total) * mult;`

E. `score = (total - 20) * mult;`

QUESTION 10

Which of the following lines of code could be used as client code for the class to the right?

A.
```
Hobbit bilbo = new Hobbit(5, 22);
bilbo.event(37);
out.println(bilbo.living());
```

B.
```
Hobbit bilbo = new Hobbit(5, 22);
event(37);
out.println(isAlive);
```

C.
```
Hobbit bilbo = new Hobbit(5, 22);
bilbo.event(37);
out.println(bilbo.isAlive);
```

D.
```
Hobbit bilbo = new Hobbit();
bilbo.event(37);
out.println(bilbo.isAlive);
```

E.
```
Hobbit bilbo = new Hobbit();
Hobbit.event(37);
out.println(Hobbit.living());
```

```
public class Hobbit
{
  private int food, injury;
  private boolean isAlive;

  public Hobbit(int f, int i)
  {
     food = f;
     injury = i;
     isAlive = true;
  }

  public boolean living()
  {
     return isAlive;
  }

  public void event(int x)
  {
     x -= food * 2;
     if(x > 0)
        injury -= x;
     if(injury <= 0)
        isAlive = false;
  }
}
```

QUESTION 11

Which of the following finds the sine of an angle measured in degrees?

A. `x = Math.sin(Math.toDegrees(angle));`

B. `x = Math.sin(angle.toRadians());`

C. `x = Math.sin(angle);`

D. `x = Math.sin(Math.toRadians(angle));`

E. `x = Math.sin(angle.toDegrees());`

QUESTION 12

What is output by the code to the right?

A. `$%o`

B. `$45`

C. `$37.00`

D. `$25`

E. `37`

```
out.printf("$%o",37);
```

QUESTION 13

What is output by the code to the right?

A.
```
15Bi\rdsI
 Yonde\rTree
```

B.
```
15BdsI
YondTree
```

C.
```
dsIi
Treee
```

D.
```
dsI
Tree
```

E. There is no output due to runtime error

```
out.print("15Bi\rdsI\nYonde\rTree");
```

QUESTION 14

What is the output by the code to the right?

A. `16`

B. `15`

C. `8`

D. `17`

E. `255`

```
int sum = 0;
int[][] list = {{13,29,36,3},
     {19,14,5,4},{27,20,38,47}};

for(int i=0; i<list.length; i++)
{
  for(int j=0; j<list[i].length; j++)
  {
     list[i][j]%=i+2;
     sum+=list[i][j];
  }
}
out.println(sum);
```

QUESTION 15

What is the output by the code to the right?

A. `120`

B. `133`

C. `106`

D. `105`

E. `119`

```
int y = 1;
for(int i = 20; i>14; i--)
  y+=i;
out.println(y);
```

QUESTION 16

What is the output by the code to the right?

A. `nknkflo`

B. `nknkfl`

C. `nk fl`

D. `nkflo`

E. `nk flo`

```
String x = "pink floyd";
x.replace(" ","nk");
int i = x.indexOf("nk");
int k = x.length()-3;
x = x.substring(i,k);
out.println(x);
```

QUESTION 17

What is the output by the code to the right?

A. `0` B. `127` C. `329` D. `32` E. `9`

```
out.println(40<<3|157>>4);
```

QUESTION 18

What is equivalent to the boolean expression to the right?

A. `false`

B. `A && B && C`

C. `true`

D. `A && B`

E. `!A || B && C`

```
A&&B&&!(!A&&B)||B&&C&&(!B||A)
```

QUESTION 19

What is the output by the code to the right?

A. `[16, 4, 1, 26]`

B. `[16, 1, 26]`

C. `[16, 9, 26]`

D. `[16, 0, 26]`

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

```
ArrayList<Integer> list;
list = new ArrayList<Integer>();
list.add(9);
list.add(4);
list.set(1,34);
list.add(0,49);
list.remove(2);
list.add(list.size()/3);
list.add(26);
list.set(0,16);
list.remove(1);
out.println(list);
```

QUESTION 20

What is output by the code to the right?

A. `HOTOS` B. `TOSOY` C. `34` D. `0612511`

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

```
String x = "THE_GOOD_DAYS";
String y = "";
for(int i=0; i<30; i+=6)
  y+=x.charAt(i%x.length());
out.println(y);
```

QUESTION 21

What is output by the code to the right?

A. `VES_OF_OTHER_OF_OTOF`

B. `IVES_OF_OTHER_P`

C. `VES_OF_OTHER`

D. `VES_OF_OTHER_OF_OT`

E. There is an index out of bounds exception.

```
String n="THE_LIVES_OF_OTHER_PEOPLE";
int x = n.length();
while (x-1>x/2)
{
  n = n.substring(x/4,x/4*3);
  x = n.length();
  out.print(n);
}
```

QUESTION 22

What is returned by the method call `ball(47,33);`

A. `WHITEODD`

B. `RED47`

C. `WHITE14`

D. `ODDWHITE`

E. `RED33`

QUESTION 23

Which method call will result in an empty string being returned?

A. `ball(15,6);`

B. `ball(72,45);`

C. `ball(45,72);`

D. `ball(44,44);`

E. `ball(6,15);`

```
public String ball(int x, int y)
{
  String ball = "";
  if(x<y)
  {
     ball+="RED";
     if(x%2==0)
        ball+=x;
     else
        ball+=y;
  }
  else if (x>y)
  {
     ball+="WHITE";
     if(y%2==1)
        ball="ODD"+ball;
     else if (x < 50)
        ball+=x-y;
  }
  return ball;
}
```

QUESTION 24

Which of the following correctly instantiates an object based on the code to the right?

A. `AI p1 = new Player();`

B. `Player p1 = new Player();`

C. `Player p1 = new AI();`

D. `Human p1 = new AI();`

E. `Human p1 = new Player();`

QUESTION 25

What could the ArrayList `hand` hold after the instantiation of an object based on the code to the right?

	AI	Human
A.	1 to 10	1 to 10
B.	1 to 10	-10 to -1
C.	all zeros	1 to 10
D.	all zeros	-10 to -1
E.	-10 to -1	all zeros

QUESTION 26

What would be the best alteration in the code to the right if we wanted to return the median value of the `ArrayList hand`?

A. write a `Median` class that inherits from `Player`.

B. write a private instance variable called `median` in the `Player` class along with an accessor method.

C. write a method called `median` in the `Human` and `AI` class.

D. write a private instance variable called `median` in the `Human` and `AI` classes along with accessors and modifiers.

E. write a method called `median` in the `Player` class.

```
public abstract class Player
{
  private ArrayList<Integer> hand;
  public Player()
  {
     hand = new ArrayList<Integer>();
     for(int i=0; i<10; i++)
        this.add();
  }

  public abstract int remove();

  public void add()
  {
     int k = (int)(Math.random()*10);
     hand.add(k);
  }

  public ArrayList<Integer> getHand()
  {  return hand; }
}

public class Human extends Player
{
  private Scanner in =
       new Scanner(System.in);
  public int remove()
  {
     System.out.println(getHand());
     System.out.println("which value
              would you to remove?");
     int value = in.nextInt();
     value = getHand().remove(value);
     return value;
  }

  public void add()
  {
  int k = (int)(Math.random()*10-10);
  getHand().add(k);
  }
}

public class AI extends Player
{
  public int remove()
  {
     return getHand().remove(0);
  }

  public void add()
  {
     int count = 0;
     for (int i:getHand())
        count+=i;
     getHand().add(count);
  }
}
```

QUESTION 27

What does the list look like at the end of the code to the right?

A. `[39, 6, 43, 41, 38, 36, 11]`

B. `[11, 41, 43, 6, 36, 38, 39]`

C. `[43, 41, 39, 38, 36, 11, 6]`

D. `[41, 11, 43, 6, 36, 38, 39]`

E. `[6, 11, 36, 38, 39, 41, 43]`

QUESTION 28

What kind of data structure is the code to the right similar to?

A. `quick sort`

B. `radix sort`

C. `heap sort`

D. `red black sort`

E. `merge sort`

```
public static void blah(int[] list)
{
  ArrayList<Integer>[] temp;
  temp = new ArrayList[10];
  for(int i=0; i<10; i++)
   temp[i] = new ArrayList<>();
  for(int k:list)
    temp[k%10].add(k);
  for(ArrayList<Integer> s:temp)
    Collections.sort(s);
  int index = 0;
  for(ArrayList<Integer> s:temp)
     while(!s.isEmpty())
        list[index++]=s.remove(0);
}

//////////////////////////////
//CLIENT CODE
int[] list = {39,6,43,41,38,36,11};
blah(list);
```

QUESTION 29

What is returned by the method call `mys("ELEPHANT")`?

A. `EPH`

B. `ANT`

C. `ELE`

D. `TNA`

E. `HPE`

QUESTION 30

What is returned by the method call
`mys("WINTER IS COMING")`?

A. `TER IS COMI`

B. `R IS COMIG`

C. `GNIMOC SI R`

D. `C SI RETNIW`

E. `WINTER IS C`

```
public String mys (String x)
{
  if(x.length()/2 < 3)
     return "";
  return
     mys(x.substring(1))+x.charAt(0);
}
```

QUESTION 31

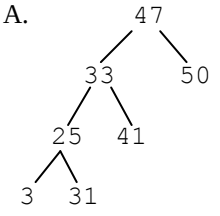
How many bytes is a `long` data type?

A. 1 B. 12 C. 4 D. 8 E. 16

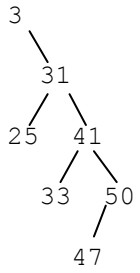
QUESTION 32

What would a sorted binary tree look like if the following numbers were entered in the order they were given: 3, 31, 25, 41, 50, 33, 47?

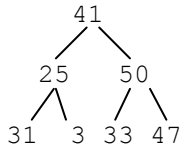
A.



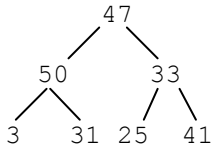
B.



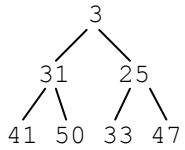
C.



D.



E.



QUESTION 33

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

A. `[3, 19, 20, 37, 43]`

B. `[20, 3, 37, 43, 19]`

C. `[3, 10, 22, 29, 32]`

D. `[3, 10, 19, 20, 32]`

E. `[22, 29, 10, 3, 32]`

QUESTION 34

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

A. `[7, 15, 19, 43, 45]`

B. `[3, 7, 22, 32, 42]`

C. `[7, 22, 29, 32, 42]`

D. `[3, 7, 10, 22, 29, 32, 42]`

E. `[45, 7, 43, 19, 15]`

QUESTION 35

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

A. `[20, 45, 3, 7, 43, 45]`

B. `[7, 22, 29, 32, 42]`

C. `[45, 7, 43, 19, 15]`

D. `[7, 22, 29, 32, 42]`

E. `[7, 15, 19, 43, 45]`

```
TreeMap<Integer,Integer> map;
map = new  TreeMap<>();
map.put(22,37);
map.put(29,43);
map.put(10,3);
map.put(3,20);
map.put(32,19);

Set<Integer> set = map.keySet();
out.println(set);            //line 1

map.remove(43);
map.remove(10);
map.put(22,7);
map.put(7,45);
map.remove(3);
map.put(42,15);
set = map.keySet();

out.println(set);            //line 2

out.println(map.values());   //line 3
```

QUESTION 36

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

A. `null`
B. `14`
C. `40`
D. `36`
E. `50`

QUESTION 37

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

A. `[40, 19, 9, 14]`
B. `[9, 19, 14, 40]`
C. `[50, 14, 36, 40]`
D. `[14, 36, 40, 50]`
E. `[null]`

```
Queue<Integer> list;
list = new LinkedList<>();

list.offer(50);
list.offer(14);
list.offer(36);
list.poll();
list.offer(40);
list.offer(14);
out.println(list.poll());   // line 1

list.poll();
list.offer(list.poll());
list.offer(19);
list.offer(9);
list.offer(list.poll());
out.println(list);          // line 2
```

QUESTION 38

What is output by the code to the right?

A. `2` B. `6` C. `5` D. `3` E. `9`

```
System.out.println(31^25);
```

QUESTION 39

What string `s` would cause the code to the right to return true?

A. `lahbluhblee`
B. `blahbluhblee`
C. `blahbluhbl`
D. `beub`
E. `ebbe`

```
s.matches("b.*e")
```

QUESTION 40

What is output by the code to the right?

A. `5`
B. `6`
C. `4`
D. `0`
E. `7`

```
String x = "imimaimaimeimtim";
String[] list = x.split("im");
out.print(list.length);
```