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 8_{10} times 20_{16} ?

A. 101000_2 B. $A2_{16}$ C. 400_8 D. 255_{10} E. 160_{16}

QUESTION 2

What is output by the code to the right?

A. 81.25   B. 80.75

C. 81.75   D. 219.75

E. 46.0

```
double x = 47;
double y = x / 2;
double z = --x + y++;
out.println(x + (int)y%3 * z);
```

QUESTION 3

What is output by the code to the right?

A. 2   B. 9

C. 0   D. 1

E. 8

```
int x = 1043;
int sum = 0;
do
{
   x %= 9;
   sum += x++;
}while(x > 1);
out.println(sum);
```

QUESTION 4

What is output by the code to the right?

A. 686970717273747576777879808182 83

B. CDEFGHIJKLMNOPQR

C. DEFGHIJKLMNOPQRS

D. 656667686970717273747576777879 80

E. 3A4A5A6A7A8A9A10A11A12A13A14A15A16A17A18A

```
for(int i=3; i<=18; i++)
   out.print((char)(i+'A'));
```

QUESTION 5

What is output by the code to the right?

A. aaaaaaa   B. platons

C. applications   D. apcis

E. aplictons

```
String w = "applications";
String temp = "";
for(int i=0; i<w.length(); i++)
{
   temp += w.charAt(i);
   w=w.replaceAll(w.charAt(i)+"","");
}
out.println(temp);
```

QUESTION 6

What is output by the code to the right?

A. they, might, be, giants

B. , , , ,

C. they, ight, be, nts

D. hey, ight, e, iants

E. they, ight, , nts

```
String[] x = {"they",
              "might",
              "be",
              "giants"};
for(int i=0; i<x.length; i++)
   x[i] = x[i].substring(i);

for(String str:x)
   out.print(str+",");
```

QUESTION 7

Which answer is logically equivalent to the following boolean expression?

```
a || b && (a || c && b || c || !b && !a && c)
```

A. `a||b&&c`   B. `a||b||c`   C. `a&&b&&c`   D. `(a||b)&&c`   E. `a&&c||b`

QUESTION 8

Which of the following could replace `<*1>` in the method to the right so that each case represents a multiple of 10 miles over the speed limit of 55?

A. `sp / 10`

B. `(sp - 55) / 10`

C. `(sp - 55) / 10 % 10`

D. `(sp - 55) % 10`

E. `sp % 10`

```java
public static int ticket (int sp)
{
   int x = <*1>;
   int cost = 50;
   switch(x)
   {
      case 0: cost += 10 * (sp - 55);
              break;
      case 1:
      case 2: cost += 30 * (sp - 65);
              break;
      case 3: cost += 50 * (sp - 85);
              break;
      default: cost += 100*(sp - 95);
              break;
   }
   return cost;
}
```

QUESTION 9

What is returned by the method call `ticket(72)`?

A. `260`

B. `170`

C. `-2450`

D. `50`

E. `170`

QUESTION 10

Which of the following would be a correct instantiation of a `DiceGame` object capable of storing 7 eight sided dice rolls?

A. `DiceGame game = new DiceGame(8,7);`

B. `game.roll(8,7);`

C. `game.roll(7,8);`

D. `DiceGame game = new DiceGame(7,8);`

E. `game.getDie(8);`

```java
public class DiceGame
{
   private int side;
   private int[] dice;

   public DiceGame(int x, int s)
   {
      side = s;
      dice = new int[x];
   }

   public void roll()
   {
      <*1>
   }

   public int getDie(int n)
   {
      return dice[n];
   }
}
```

QUESTION 11

What can replace `<*1>` in the class to the right such that it will roll all the dice?

A. `dice = (int)(Math.random()*side+1);`

B. `for(int i = 0; i<dice.length; i++)`
    `dice[i]=(int)(Math.random()*dice.length);`

C. `for(int i = 0; i<dice.length; i++)`
    `dice[i] = (int)(Math.random()*side+1);`

D. `for(int i = 0; i<dice.length; i++)`
    `dice[i] = Math.random()*side;`

E. `return (int)(Math.random()*side+1);`

| **QUESTION 12**<br><br>What is output by the code to the right ( * indicates a space )?<br><br>A. `4.585.663.61`<br>B. `*4.58*5.66*3.61`<br>C. `5.2f4.585.2f5.665.2f3.61`<br>D. `****4.58****5.66****3.61`<br>E. loss of precision error | ```java
int[] value = {21,32,13};
for(int x : value)
  out.printf("%5.2f",Math.sqrt(x));
out.println();
``` |
| **QUESTION 13**<br><br>How many illegal escape characters are in the code to the right ?<br><br>A. 3            B. 2<br>C. 6            D. 4<br>E. 5 | ```java
out.print("\t\r\o\l\h\n\t\e\r");
``` |
| **QUESTION 14**<br><br>What is output by the code to the right?<br><br>A. `0`<br>B. `8`<br>C. `10`<br>D. `6`<br>E. `12` | ```java
int[][] mat = new int[4][4];
for(int r=0; r<4; r++)
  for(int c=0; c<r; c++)
    mat[r][c] = 2*r+2*c;
out.println(mat[3][1]);
``` |
| **QUESTION 15**<br><br>What is output by the code to the right?<br><br>A. `kmmln`<br>B. `utlkm`<br>C. `tyrion`<br>D. `vumln`<br>E. There is no output due to a syntax error. | ```java
String let = "tyrion";
String temp = "";
for(int i=0; temp.length()<5;
              i=(i+1)%let.length())
{
  char x = let.charAt(i);
  char y = let.charAt(i+1);
  int  k = Math.abs(x-y)/2;
  temp += (char)(Math.min(x,y) + k);
}
out.println(temp);
``` |
| **QUESTION 16**<br><br>What is output by the code to the right?<br><br>A. `jammydodger`<br>B. `mmjaydodger`<br>C. `jamydodger`<br>D. `jaydodger`<br>E. There is no output due to a syntax error. | ```java
String s = "jammydodger";
s.replaceAll("m","");
out.println(s);
``` |
| **QUESTION 17**<br><br>What is output by the code to the right?<br><br>A. `30`     B. `41`     C. `60`     D. `75`     E. `0` | ```java
out.println(12 | 48);
``` |

QUESTION 18

Which of the following is equivalent to `(A && C || A)&&(A && B && C || A && B)||(A && C || A && B && C)`

A. `A || B || C`   B. `A && B && C`
C. `A`   D. `A && B || C`
E. `A && (B || C)`

QUESTION 19

What is output by the code to the right?

A. [N, Na, Nap, Napo, Napol, Napoli]

B. [i, li, oli, poli, apoli, Napoli]

C. [Napoli, apoli, poli, oli, li, i]

D. [Napoli, Napol, Napo, Nap, Na, N]

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

```
ArrayList<String> list;
list = new ArrayList<String>();
String name = "Napoli";
for(int i=0; i<name.length(); i++)
  list.add(list.size()-i,
           name.substring(i));
out.println(list);
```

QUESTION 20

What is output by the code to the right?

A. 15   B. 6   C. 12
D. 8   E. 10

```
int x[] = {29,44,6,42,43,16};
int i = 1;
int count = 0;
while( x[i]!=50 )
{
  x[i] += 3;
  i = (i+1) % x.length;
  count++;
}
out.println(count);
```

QUESTION 21

What would the array contain after the code to the right is done?

A. [29, 44, 6, 42, 43, 16]

B. [29, 50, 6, 42, 43, 16]

C. [35, 50, 12, 48, 49, 22]

D. [32, 47, 9, 45, 46, 19]

E. [35, 50, 12, 51, 52, 22]

QUESTION 22

What is returned by the method call `met(x)`, provided list is defined as `int[] x = {29,6,30,16,45,37};`

A. [CASH, MC, AMX, MC, AMX, VISA]

B. [null, null, null, null, null, null]

C. [AMX, MC, VISA, DISCY, CASH, null]

D. [VISA, AMX, MC, AMX, MC, CASH]

E. [MC, CASH, DISCY, CASH, DISCY, AMX]

```
public static String[] met(int[] x)
{
  String[] corp =
        {"AMX","MC","VISA","DISCY"};
  int c = x.length;
  String[] temp = new String[c];
  while(c>0)
  {
    if(x[c-1]%5<corp.length)
      temp[c-1]=corp[x[c-1]%5];
    else
      temp[c-1]="CASH";
    c--;
  }
  return temp;
}
```

QUESTION 23

What could the the array x be in order to return the following array when `met(x)` is called:

[DISCY, VISA, AMX, MC]

A. [10, 2, 31, 24]

B. [2, 31, 24, 10]

C. [23, 12, 30, 19]

D. [48, 42, 15, 26]

E. [16, 48, 22, 34]

QUESTION 24

Which of the following would be a correct `Hero` instantiation?

A. `Hero rincewind = new Mage();`

B. `Mage merlin = new Hero(true);`

C. `Mage gandolf = new Hero();`

D. `Hero fizban = new Hero(10,10,10);`

E. `Mage raistlin = new Mage(true);`

QUESTION 25

Which of the following could replace **<*1>** in the code to the right?

```
A. super();
   stats[0] += -2;
   stats[2] += 2;
B. super();
   getStr(-2);
   getMag(2);
C. raise(0, -2);
   raise(2,  2);
   mageShield = false;
D. super();
   stats[0] = -2;
   stats[2] = 2;
E. super();
   getStr(-2);
   getMag(2);
   mageShield = false;
```

QUESTION 26

Which of the following could replace **<*2>** without error?

```
A. public int pow()
   { return super.pow()*2; }
B. public int takeDamage()
   { return takeDamage()*2; }
C. public void raise(int i, int j)
   { return raise(i,j) + 100; }
D. public int getMag()
   { return stats[2]+10; }
E. public void getStr()
   { return stats[0]-10; }
```

```java
public class Hero
{
  private int[] stats;
  private int hp;

  public Hero()
  {
    stats = new int[3];
    for(int i = 0; i<3; i++)
      stats[i]=10;
  }

  public int getStr()
  {  return stats[0];  }

  public int getAgil()
  {  return stats[1];  }

  public int getMag()
  {  return stats[2];  }

  public void takeDamage(int x)
  {   hp -= x;   }

  public void raise(int i, int j)
  {  stats[i] += j;   }

  public int pow()
  {
    int x=0;
    for(int i:stats)
      x+=i;
    return x;
  }
}

public class Mage extends Hero
{
  private boolean mageShield;

  public Mage()
  {
    <*1>
  }
  public void shieldOnOrOff()
  {
    mageShield = !mageShield;
  }

  <*2>
}
```

QUESTION 27

What would print out after the running the code below with the code to the right?

```
String[] n =
        {"these","are","the","good","times"};
out.println(mys(n));
```

A. 42

B. 46

C. 41

D. 40

E. 44

QUESTION 28

What would print out after the running the code below with the code to the right?

```
String[] m = {"knock","em","out","john"};
out.println(mys(m));
```

A. 31

B. 27

C. 26

D. 20

E. 28

```
public static int mys(String[] str)
{
  int temp = 0;
  for(int i=0; i<str.length-1; i++)
    if(str[i].compareTo(str[i]+1)<0)
        temp+=str[i].charAt(0)-'a';
    else
        temp-=str[i+1].charAt(0)-'a';
  return temp;
}
```

QUESTION 29

What is returned by the method call van(5) ?

A. -6

B. -1

C. 9

D. -2

E. 11

QUESTION 30

What is returned by the method call van(4) ?

A. 4

B. 9

C. 6

D. 2

E. 0

```
public static int van(int x)
{
  if(x > 10)
     return 1;
  else if (x<0)
     return -1;
  if(x%2==0)
     return van(x+3)+3;
  else
     return van(x-1)-4;
}
```
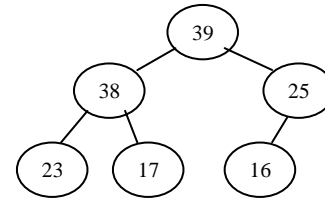
QUESTION 31

What would a max-heap look like if created using the list： 38, 23, 25, 39, 17, 16?

A.

```
        16
      /    \
    23      17
   /  \    /
  39  38  25
```
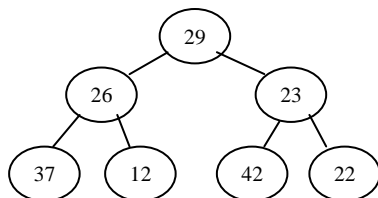
B.

```
        39
      /    \
    38      25
   /  \    /
  23  17  16
```

C.

```
        38
      /    \
    23      39
   /  \
  17  25
  /
 16
```

D.

```
        38
      /    \
    23      25
   /  \    /
  39  17  16
```

E.

```
        39
      /    \
    25      23
   /  \    /
  16  17  38
```
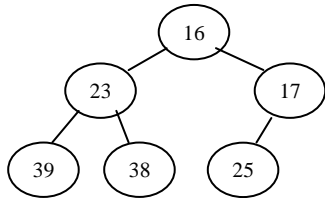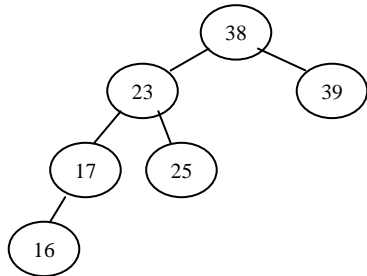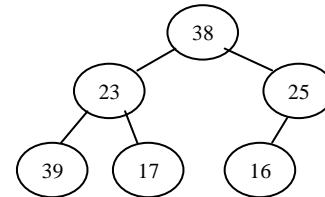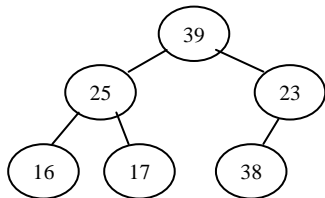
QUESTION 32

What would print out for a post-order traversal thru the following tree?

```
          29
       /      \
     26        23
    /  \      /  \
  37   12   42   22
```

A. 37, 12, 26, 42, 22, 23, 29

B. 29, 26, 37, 12, 23, 42, 22

C. 22, 42, 12, 37, 23, 26, 29

D. 37, 26, 12, 29, 23, 42, 22

E. 29, 26, 23, 37, 12, 42, 22

QUESTION 33

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

A. [48, 47, 31, 14, 13, 5]

B. [5, 13, 14, 31, 47, 48]

C. [13, 31, 14, 47, 48, 5]

D. [31, 5, 47, 13, 48, 14]

E. [14, 48, 13, 47, 48, 5]

QUESTION 34

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

A. [40, 20, 14]

B. [14, 20, 40, 48]

C. [48]

D. [48, 14, 40, 20, 40]

E. [14]

```
TreeMap<Integer,TreeSet<Integer>> x;
x = new TreeMap<Integer,TreeSet<Integer>>();

x.put(31,new TreeSet<Integer>());
x.put(5, new TreeSet<Integer>());
x.put(47,new TreeSet<Integer>());
x.put(13,new TreeSet<Integer>());
x.put(48,new TreeSet<Integer>());
x.put(14,new TreeSet<Integer>());
x.get(14).add(47);
x.get(5).add(48);
x.get(31).add(31);
x.get(5).add(14);
x.get(13).add(14);
out.println(x.keySet());  //1

x.get(5).add(40);
x.get(13).add(31);
x.get(48).add(40);
x.get(47).add(5);
x.get(5).add(20);
x.get(31).add(20);
x.get(5).add(40);
out.println(x.get(5));   //2
```
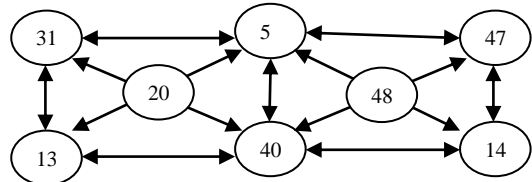
QUESTION 35

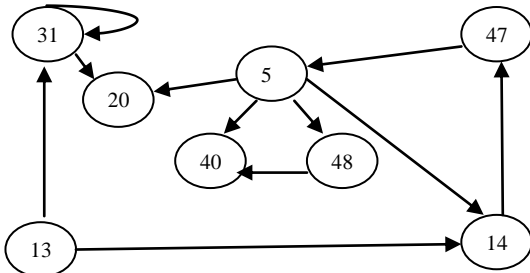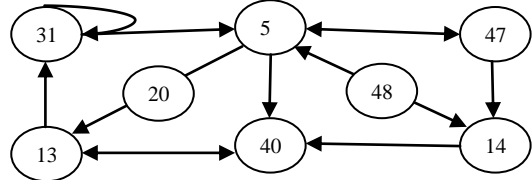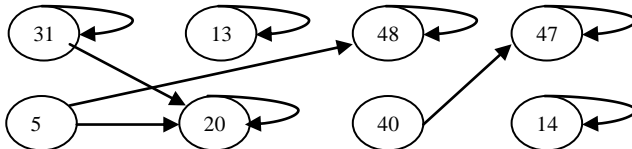What would the graph look like from the code used in Question 33-34?

QUESTION 36

What is output by the code to the right?

A. 49   B. 17

C. 14   D. 44

E. 5

QUESTION 37

What is the last value being held in the priority queue after the code at right has executed?

A. 41   B. 23

C. 44   D. 5

E. 14

```
PriorityQueue<Integer> x;
x = new PriorityQueue<Integer>();
x.add(14);
x.add(5);
x.add(17);
x.add(31);
x.remove();
x.add(44);
x.add(41);
x.add(23);
out.println(x.remove());
```

QUESTION 38

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

A. 7   B. 3

C. 6   D. 4

E. 5

QUESTION 39

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

A. y_p   B. _w

C. l_d   D. _lucky

E. l_do_you_fe

QUESTION 40

What is the output by the line marked **//3** in the code at right?

A. feel   B. well

C. y   D. yo

E. ky

```
String s;
s="well do you feel lucky";
String[] list;

list=s.split("[aei][^aei]");

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

out.println(list[2]);    //2

list=s.split("[ou][^ou]");

out.println(list[1]);    //3
```