The time limit for the contest is 45 minutes. Each correct question is awarded 6 points; no points are given or subtracted if unanswered; 2 points are deducted for an incorrect answer.

Best of Texas 2015-16 Computer Science Test 3

1. What does 426_{16} minus $B13_{16}$ equal?

   a. $-60D_{16}$
   b. $-6ED_{16}$
   c. -617_{16}
   d. $-CED_{16}$
   e. $-CDC_{16}$

2. What is the output of the code at right?

   a. .1
   b. .3
   c. 1
   d. 1.3
   e. 3

```
int x = 4;
int y = 3;
int z = (x + y * y) % 10;
out.print (z);
```

3. What is the output of the code at right?

   a. 10
   b. 11
   c. 40
   d. 45
   e. 46

```
int score = 0;
for (int i = -2; i <= 20; i++)
  score +=2;
out.print (score);
```

4. What is the output of the code at right?

   a. true
   b. false
   c. U
   d. UIL
   e. null

```
Boolean[] UIL = new Boolean[3];
out.print(UIL[1]);
```

5. What is the output of the code at right?

   a. ou
   b. iou
   c. aeiou
   d. vowel
   e. error

```
String vowel =
         "aeiou".substring(3,5);
out.print (vowel);
```

6. What is the output of the code at right?

a. 4 b. 5.5 c. 40 d. 47

```
out.print (47-26/4*1-1);
```

---

7. What is the output of the code at right?

a. 14
b. 15
c. 14.6
d. error

```
int x = 12;
x += 2.6;
out.print(x);
```

---

8. What is the output of the code at right?

a. 20
b. 25
c. 30
d. error

```
int j = 0;
int k;
for (k = 0; k < 5; k++)
  j += k * 2;
out.print (j + k);
```

---

9. What is the output of the code at right?

a. 2
b. 10
c. 250
d. 1024
e. 100000

```
int j = 1000;
j = j >> 2;
out.print (j);
```

---

10. What is the output of the code at right?

a. -4
b. -4.0
c. -4.5
d. -5
e. -5.0

```
double d = -4.2;
out.print (Math.ceil(d));
```

11. What is the output of the code at right?

a. -1
b. 0
c. 1
d. 5
e. error

```
int num = 0, i = 5;
while (i > 0){
  num++;
  i--;
  }
out.print (i);
```

---

12. What is output by Line 1 at right?

a. blue green
b. dark green
c. light green
d. yellow green
e. light blue

13. What is output by Line 2 at right?

a. blue green
b. dark green
c. light green
d. yellow green
e. light blue

14. What is output by Line 3 at right?

a. blue green
b. dark green
c. light green
d. yellow green
e. light blue

15. What is output by Line 4 at right?

a. blue green
b. dark green
c. light green
d. yellow green
e. light blue

```
class Color{
  void tint() {print("blue
    green");}
  void hue() {print("yellow
    green");}
  void print (String st){
    out.print(st);
  }
 }

class Blues extends Color{
  void tint() {print ("dark
    green");}
}

class Greens extends Color {
  void hue() {print("light
blue");}
}

public class Paint {
  public static void main
                (String args[]){
    Color blend;
    blend = new Blues();
    blend.tint();       //Line 1
    blend.hue();        //Line 2

    blend = new Greens();
    blend.tint();       //Line 3
    blend.hue();        //Line 4
  }
}
```

16. What is the output of the code at right?

a. 033
b. 27
c. 020
d. 0x33
e. 0111

```
out.print (012 + 021);
```

---

17. What is the output of the code at right?

a. Horse 4.5
b. Horse 1.1
c. Horse 42.5
d. Horse 2.55
e. Horse 42.515

```
String s1 = "Horse";
double d = 42.515;
out.printf ("%s %1.1f", s1, d);
```

---

18. What is the output of the code at right?

a. 1 3
b. 3
c. 3 5
d. 5
e. error

```
int array[] = {1, 3, 5, 7, 9};
out.print (array [2]);
```

---

19. What is returned by the method call *test(1)* in the code at right?

a. -1
b. 0
c. 1
d. 4
e. 6

```
public static int test(int i){
  if (i <= 0)
    return 0;
  else
    return 1 + test (i-2);
}
```

---

20. What is the output of the code at right?

a. 10
b. 11
c. 19
d. 20
e. 100

```
int sum = 0;
for (int i = 0; i < 10; i++){
  for (int j = 0; j < 10; j++){
    sum++;
    if (sum >= 10) break;
  }
}
out.print(sum);
```

21. What is output by Line 1 at right?

a. 1
b. 2
c. 12
d. 1234
e. 234

```
String s1 = "1727374";
String[] s2 = s1.split("7");
out.print (s2[1]);      //Line 1
out.print (s2.length);//Line 2
```

---

22. What is output by Line 2 at right?

a. 1
b. 2
c. 3
d. 4
e. error

---

23. What is the output of the code at right?

a. 50-20-0
b. 50-20-2
c. 50-20-2.5
d. 30
e. 27.5

```
int a = 50;
int b = 20;
int c = b/a;
out.print(a + "-" + b + "-"+ c);
```

---

24. What is returned by the method call *m(6)* in the code at right?

a. 2
b. 3
c. 4
d. 5
e. 8

```
public static int m (int i){
  int j = i;
  j = i-1;
  i /= 2;
  return i + j;
}
```

25. What is the output of the code at right?

a. 18
b. 22
c. 28
d. 48
e. 184

```
int a = 3;
int b = a;
b++;
a *= b + 2;
out.print(a + b);
```

---

26. Which of the following is not a Java keyword?

a. byte
b. sort
c. transient
d. volatile
e. default

---

27. What is the output of the code at right?

a. symbol \\\\
b. symbol "\"
c. symbol "\\"
d. symbol \"\\"
e. An error will occur.

```
out.print(symbol "\"\\\"");
```

---

28. What is returned by the method call Weather.hot(15)?

a. 14
b. 16
c. 14.0
d. 16.0

```
public class Weather{

public static double hot(int a)
   {
       return a-1;
    }

public static double hot(double a)
   {
       return a+1;
    }
  {
```

29. What is the output of the code at right?

a. [2, 4, 8]
b. [2, 8]
c. [2, 6, 10]
d. [2, 4]

```
Stack<Integer> st;
st = new Stack<Integer>();
st.push(2);
st.push(4);
st.peek();
st.push(6);
st.pop();
st.push (8);
st.push(10);
st.pop();
st.peek();
out.print(st);
```

30. What is the output of the code at right?

a. 1133
b. 2244
c. 1144
d. 2233
e. 3333

```
public class A{
 public static void main
                  (String[] args)
 {
   int ar[]={1,2,3,4};
   int a, b, c;
   for (a=0; a<2; a++)
     ar[a]+= a;
   for (b=0;b<=1;b++)
     for (c=0;c<=1;c++)
     {
       if (a%2==0)
         out.print(ar[a]);
     }
 }}
```

31. What is the maximum number of levels a binary search tree with 32 elements could have?

a. 8
b. 12
c. 16
d. 24
e. 32

32. What elements are contained in the set *set1* following execution of the code at right?

a. [2, -3]
b. [2, 2, -3, -3]
c. [2, 2, 2, 4]
d. [-1, -2, 3, 4]
e. []

```
int[] ar = [2, -2, 2, -3, 3, -3];
Set<Integer> set1 = new
              HashSet<Integer>();
for (int i : ar)
   set1.add(i);
Set<Integer> set2 = new
               TreeSet<Ineger>();
for (int i : ar)
   set2.add(i + 1);
set1.removeAll(set2);
```

33. What is output by Line 1 at right?

a. 0
b. null
c. 50
d. There will be no output.
e. error

```
String whole="109209309409509";
String[] parts=whole.split("9");
out.print (parts[4]);   //Line 1
out.print(parts.length);//Line 2
```

34. What is output by Line 2 at right?

a. 1
b. 5
c. 6
d. error

35. What is returned by the method call *m(1)* in the code at right?

a. -2
b. 0
c. 2
d. 4
e. 5

```
public static int m (int i){
  int num = 0;
  if(i <=0)
    num = 2;
  else
    num = 2 + m(i-1);
  return num;
}
```

36. Which of the following is not automatically initialized to 0 or null?

a. a local variable
b. an array element
c. an instance variable
d. all are automatically initialized

37. Which of the following best represents array ar after execution of the code at right?

```
int [][] ar = new int[3][4];
for (int i = 0; i < 3; i++)
  for (int j = 0; j < 4; j++)
    ar[i][j] = i;
```

a.

0	0	0	0
0	0	0	0
0	0	0	0

b.

0	1	2	3
0	1	2	3
0	2	2	3

c.

0	0	0	0
1	1	1	1
2	2	2	2

d.

1	2	3	4
1	2	3	4
1	2	3	4

38. What is the output of the code at right?

a. c
b. h
c. ch
d. hool
e. chool

```
public class A {
   public static void main
                (String[] args){
 out.print ("school".charAt(2));
 }
}
```

39. The following values are inserted one at a time in the order shown (left to right) into a binary search tree using the traditional insertion algorithm. What is the height of the resulting tree? (The height of a tree is the number of links from the root node to the deepest leaf.)

-5, 6, 15, 8, 17, 32, 8, 9, 10

a. 2
b. 3
c. 4
d. 5
e. 6

40. What is returned by the method call m(6)?

a. 1
b. 2
c. 6
d. 24
e. 33

```
public int m (int x){
 if(x <= 2)
    return x * 2;
 else
    return m(x-2) + m(x-1) + 1;

}
```

Best of Texas 2015-16 Computer Science Test 3 Answer Key

1.	B	21.	B
2.	E	22.	D
3.	E	23.	A
4.	E	24.	E
5.	A	25.	B
6.	C	26.	B
7.	A	27.	E
8.	B	28.	C
9.	C	29.	A
10.	B	30.	E
11.	B	31.	E
12.	B	32.	A
13.	D	33.	C
14.	A	34.	B
15.	E	35.	D
16.	B	36.	A
17.	C	37.	C
18.	D	38.	B
19.	C	39.	D
20.	C	40.	E

Computer Science Answer Sheet

1. _____	11. _____	21. _____	31. _____
2. _____	12. _____	22. _____	32. _____
3. _____	13. _____	23. _____	33. _____
4. _____	14. _____	24. _____	34. _____
5. _____	15. _____	25. _____	35. _____
6. _____	16. _____	26. _____	36. _____
7. _____	17. _____	27. _____	37. _____
8. _____	18. _____	28. _____	38. _____
9. _____	19. _____	29. _____	39. _____
10. _____	20. _____	30. _____	40. _____

correct x 6 _____

incorrect x 2 -_____

_____