

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 2019-20 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. 5
- b. 10
- c. 11
- d. 20
- e. 22

```
int sum = 0;
for (int i = 0; i <= 10; i++)
    sum += 2;
out.print (sum);
```

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

- a. 10
- b. 17
- c. 17.5
- d. 20
- e. 22

```
int i = 2;
int j = 3;
int k = 5;
k = k * j + k / i;
out.print (k);
```

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

- a. er
- b. xc
- c. xer
- d. xerc
- e. exer

```
String s = "exercise";
out.print (s.substring(1,4));
```

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

- a. 0
- b. 3
- c. 6
- d. 10
- e. 15

```
int a = 0;
int b = 5;
Integer c;
while (b > 0){
    a+=b;
    b--;
}
c = new Integer(a);
out.print(c.intValue());
```

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

- a. 9
- b. 36
- c. 45
- d. 81
- e. 90

```
int total = 0;
int n = 9;
for (int i = 0; i < n; i++)
    for (int j = 0; j < n; j++)
        total++;
out.print (total);
```

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

- a. A
55B
C75
- b. "A"
55B"C"75
- c. "A"
55"B"
"C"75
- d. "A"
55"B""C"75
- e. A compile-time error will be generated.

```
out.println("\A\");
out.print(55 + "B");
out.print("\C\""+75);
```

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

- a. 6 b. 7 c. 8
- d. An error will be generated.

```
String snack = "popcorn";
out.print(snack.length());
```

9. In the code at right, how many stars will be printed?

- a. 0
- b. 5
- c. 10
- d. 15
- e. 25

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

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

- a. Hi
- b. Hi Hi
- c. Hi Hi Hi
- d. Hi Hi Hi Hi
- e. Hi Hi Hi Hi Hi

```
int count = 1;
while (count < 4){
    out.print("Hi ");
    count++;
}
```

11. What is the output of the code at right?
- a. 0123
 - b. 1234
 - c. 2345
 - d. 3456
 - e. 4567

```
int[][] m = new int[4][4];
for (int i = 0; i < 4; i++)
    for (int j = 0; j < 4; j++)
        m[j][i] = i + j;
for (int i = 0; i < 4; i++)
    out.print (m[2][i]);
```

12. What is output by *Line 1* at right?
- a. 0
 - b. 3
 - c. 4
 - d. 9
 - e. 16

```
int[] nums = new int [10];
int i =3;
while (i <10) {
    nums[i] = i * i;
    i = i + 2;
}
out.println (nums[4]); //Line 1
out.print (nums[7]); //Line 2
```

13. What is output by *Line 2* at right?
- a. 0
 - b. 4
 - c. 5
 - d. 16
 - e. 49

14. What is the output of the code at right?
- a. -1
 - b. 0
 - c. 6
 - d. There will be no error or output.
 - e. A run-time error will be generated.

```
out.print("123456".indexOf('7'));
```

15. What is the output of the code at right?
- a. 3.0
 - b. 3.75
 - c. 4.75
 - d. 5
 - e. 5.0

```
int a = 11;
int b = a/3;
double c = b/4;
out.print(b + c);
```

<p>16. What is the output of the code at right?</p> <ul style="list-style-type: none">a. 0b. 1c. 2d. 3e. 4	<pre>int ar[] = {1,2,3,4,5,6}; int x = 1; int y; x = ar[x]; x+=2; y=ar[x]; out.print(x*y);</pre>
<p>17. Which of the following is equivalent to the expression at right?</p> <ul style="list-style-type: none">a. (b>=a)&&(c>=a)b. !(a>c) !(c>b)c. !(a>c)&&!(c>b)d. all of the above	<pre>!((a>b) (a>c))</pre>
<p>18. What is the output of the code at right?</p> <ul style="list-style-type: none">a. truefalseb. falsetruec. truetrued. falsefalse	<pre>boolean a = true; boolean b = false; out.print(!(a && b)); out.print(!a && !b);</pre>
<p>19. What is the output of the code at right?</p> <ul style="list-style-type: none">a. FGb. 1516c. 31d. truee. false	<pre>Integer i; Integer j; i = new Integer (15); j = new Integer (16); out.print (i.intValue()+j.intValue());</pre>
<p>20. What is the output of the code at right?</p> <ul style="list-style-type: none">a. -3b. 1c. 5d. 6e. 10	<pre>int [] ar = new int []{5, -3, 6, 10, 9}; Arrays.sort(ar); out.print(ar[1]);</pre>

21. What is returned when the method at right is called with `m(0, 6)`?

- a. 0
- b. 30
- c. 60
- d. 90
- e. -1

```
public static int m(int a, int b){  
    if (a==0) return 0;  
    if (a < 0) return m(-a, b);  
    return b + m(--a, b);  
}
```

22. What is returned when the method at right is called with `m(-5, -6)`?

- a. 0
- b. -30
- c. -60
- d. -90
- e. -1

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

- a. 1 AB
- b. 3 14
- c. 2 AB14C
- d. 5 A
- e. 4 14

```
String st = "AB14CD78E";  
String[] st2 = st.split("\\D+");  
out.print(st2.length);  
out.print(" " + st2[1]);
```

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

- a. 52
- b. 56
- c. 66
- d. 68
- e. 70

```
out.print(16 + 016 + 0x16);
```

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

- a. 0
- b. 4
- c. 5
- d. 17
- e. 46

```
int x = 60;
int y = 45;
out.print(x^y);
```

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

- a. 12
- b. 15
- c. 18
- d. 20
- e. 21

```
int[][] t = {{1,2,3},{4,5,6},{7,8,9}};
int sum = 0;
for (int i = 0; i < 2; i++)
    for (int j = 0; j < 3; j++) {
        sum += t[i][j];
    }
out.print (sum);
```

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

- a. 110
- b. 112
- c. 114
- d. 116
- e. 124

```
out.print(015 + 101);
```

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

- a. 40
- b. 1919
- c. 1921
- d. 2119
- e. 2121

```
String s1 = "19";
String s2 = s1;
s1 = "21";
out.print(s1 + s2);
```

29. What is the output of the code at right?
- a. 0123
 - b. 2345
 - c. 3456
 - d. 02122232
 - e. 12223242

```
Object ob [] = new Object [4];
for (int i = 0; i < 4; i++)
    ob[i] = new Integer(i);
for (int j = 0; j < 4; j++)
    out.print (ob[j].toString() + 2);
```

30. What is the output of the code at right?
- a. 0
 - b. 1
 - c. 2
 - d. 3
 - e. A run-time error will occur.

```
TreeSet<String> st = new TreeSet<String>();
st.add("one");
st.add("two");
st.remove("two");
st.add("two");
st.add("one");
st.remove("one");
st.remove("three");
out.print(st.size());
```

31. Which one of the following is not a class that implements the *Collection* interface?
- a. ArrayList
 - b. LinkedList
 - c. TreeMap
 - d. TreeSet
 - e. HashSet

32. Considering an implementation of the insertion sort using a singly-linked list, what is the best-case running time starting with an initially empty list?
- a. $O(n)$
 - b. $O(\log n)$
 - c. $O(n^2)$

33. What is output by *Line 1* at right?

- a. Apples & Bananas
- b. apples 26 bananas
- c. apples 7 bananas
- d. apples & bananas
- e. apples and bananas

```
String s1 = "Apples & Bananas";  
String s2 = s1.toLowerCase();  
out.print (s2); //Line 1  
out.print (s1); //Line 2
```

34. What is output by *Line 2* at right?

- a. Apples & Bananas
- b. apples 26 bananas
- c. apples 7 bananas
- d. apples & bananas
- e. apples and bananas

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

- a. 2
- b. 3
- c. 6
- d. 7
- e. 8

```
int[] nums = {4, 2, 6, 8, 2, 11};  
nums[2]++;  
out.print (nums[2]);
```

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

- a. 0
- b. 7
- c. 111
- d. 237
- e. 11101

```
int num = 29;  
num = num >> 2;  
out.print (num);
```

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

- a. 0
- b. 2
- c. 6
- d. 24
- e. 32768

```
int x = 6;  
int y = 2;  
int z = x << y;  
out.print (z);
```

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

- a. -1
- b. 0
- c. 1
- d. Size() cannot be determined.

```
ArrayList st;  
st = new ArrayList<String>();  
out.print(st.size());
```

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

(Free Response: Write your answer on the blank on the answer sheet.)

```
StringBuffer sb = new StringBuffer ("hat");  
sb.insert(sb.indexOf("at"), 'i');  
out.print (sb);
```

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

(Free Response: Write your answer on the blank on the answer sheet.)

```
ArrayList<Integer> list;  
list = new ArrayList<Integer>();  
list.add(1);  
list.add(new Integer (3));  
list.add(2);  
list.add(new Integer(4));  
Collections.sort(list);  
for (int i : list)  
    out.print(i);
```

Best of Texas 2019-20 Computer Science Test 3 Answer Key

- | | | | |
|-----|---|-----|------|
| 1. | B | 21. | A |
| 2. | E | 22. | B |
| 3. | B | 23. | B |
| 4. | C | 24. | A |
| 5. | E | 25. | D |
| 6. | D | 26. | E |
| 7. | B | 27. | C |
| 8. | B | 28. | D |
| 9. | D | 29. | D |
| 10. | C | 30. | B |
| 11. | C | 31. | C |
| 12. | A | 32. | A |
| 13. | E | 33. | D |
| 14. | A | 34. | A |
| 15. | A | 35. | D |
| 16. | E | 36. | B |
| 17. | A | 37. | D |
| 18. | A | 38. | B |
| 19. | C | 39. | hiat |
| 20. | C | 40. | 1234 |

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 - _____
