Computer Science Contest #1718-08 January 06, 2018

Note: Correct responses are based on Java, **J2sdk v 1.8.x**, 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. **For all output statements, assume that the System class has been statically imported… *import static java.lang.System.\*;***

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| Question 1 xx  What is 0b100012 + FD16?  A. 1000010102 B. 110324 C. 4268 D. 10e16 E. 29010 | |
| Question 2 xx  What is output by the code to the right?  A. 17 B. 17.5 C. 5.0 D. 5 E. 14.5 | int x = 5;  int y = 7;  double z = 12.5;  out.println(x % y+z); |
| Question 3 xx  What is output by the code to the right?  A. Go B. GO C. PRINT D. %S%n E. print | String print = "Go";  out.printf("%S%n","print"); |
| Question 4 xx  What is output by the code to the right?  A. abcdefg B. \*\*\*defg C. abc D. \*\*\* E. defg | String s = "abcdefg";  s.replace("abc", "\*\*\*");  out.println(s); |
| Question 5 xx  What is output by the code to the right?  A. true B. false C. True D. 0 E. False | out.println(15>5 && (9>10)||(6<7)); |
| Question 6 xx  What is output by the code to the right?  A. 10.0 B. 11.0 C. 11 D. 10 E. 9 | out.println(Math.floor(10.9)); |
| Question 7 xx  What is output by the code to the right?  A. 10 B. 6 C. 8 D. 12 E. 14 | int a = 10;  int b = 12;  int c = a-b;  b = c + a;  out.println(b); |
| Question 8 xx  What is output by the code to the right?  A. 1 B. -54 C. 0 D. -6 E. 11 | int a = 11;  int b = 1;  switch(a)  {  case 0: b+=10;  case 1: b-=2;  default:  case 4: b\*=6;  case 12: b\*=-1;  }  out.println(b); |

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| Question 9 xx  What is output by the code to the right?  A. 0 1 2 3 4 5  B. 0 1 2 3 4  C. 1 2 3 4 5  D. 5  E. 15 | int a = 0;  for(int i = 0; i <= 5; i++)  {  out.print(a+" ");  a = a+1;  } |
| Question 10 xx  What is output by the code to the right?  A. 1 B. 2 C. 3 D. 4 E. 12 | int[] arr = new int[] {1,2,3,4,5};  arr[0] = arr[arr[2]];  arr[3] = 12;  out.println(arr[0]); |
| Question 11 xx  What is output by the code to the right?  A. 8 B. 6 C. 9 D. 7 E. 1 | String s = "1.0 2 -.03"  +" 4 b 2.0";  double a = 0.0;  Scanner scan = new Scanner(s);  while(scan.hasNextDouble())  a+=scan.nextDouble();  out.println((int)a); |
| Question 12 xx  What is output by the code to the right?  A. 8 B. 25 C. 10 D. 24 E. 9 | int a = 0;  for(int q = 0; q < 25; q+=3)  a++;  out.println(a); |
| Question 13 xx  What is output by the code to the right?  A. 8 B. 20 C. 2 D. 24 E. 0 | out.println(10>>2^20+2); |
| Question 14 xx  What is output by the code to the right?  A. -128 B. -1 C. 255 D. 127 E. 0 | out.println((byte)(255)); |
| Question 15 xx  What is output by the code to the right?  A. [Test]  B. [Yerp]  C. [Test, Yerp]  D. [Yerp, Test]  E. There is no output due to a runtime error | ArrayList<String> list = new ArrayList<>();  list.add("Yerp");  list.add("Test");  list.add(list.remove(0));  out.println(list); |

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| Question 16 xx  What is output by the code to the right?  A. A B. 2147483647  C. 65535 D. 65  E. z | int x = 20;  int z = Integer.MAX\_VALUE;  out.println(x!=20? z:'A' ); |
| Question 17 xx  Which of the following is equivalent to !(A||B)&&C  A. !A||!B&&C  B. !A&&!B&&C  C. B&&C  D. A||B||C  E. !(A||B||C) | |
| Question 18 xx  What is output by the code to the right?  A. [3, 4, 5, 6, 7]  B. [0, 1, 2, 3, 4]  C. [3, 4]  D. [0, 1, 2]  E. [5, 6, 7] | ArrayList<Integer> list = new ArrayList<>();  ArrayList<Integer> list2 = new ArrayList<>();  for(int i = 0; i < 5; i++)  list.add(i);  for(int i = 3; i < 8; i++)  list2.add(i);  list.retainAll(list2);  out.println(list); |
| Question 19 xx  What is output by the code to the right?  A. -2 B. 3 C. 1 D. 0 E. 2 | out.println(-30%-4); |
| Question 20 xx  What is output by the code to the right?  A. 200 B. 100  C. 5 D. 0  E. There is no output due to a syntax error | int x = 5;  do  x\*=20;  while(x<3);  out.println(x); |
| Question 21 xx  What is output when the method q21 is called?  A. 13 B. 39 C. 12 D. 36 E. 96 | public static void q21() {  out.println(go(1));  }    public static int go(int x)  {  if(x%12==0)  return x;  return go2(x+5);  }    public static int go2(int x)  {  if(x%13==0)  return x;  return go(x+2);  } |
| Question 22 xx  What is output by the code to the right?  A. 1217 B. 217 C. 1216 D. 216 E. 16 | int x = 15;  if(x <= 15 && x++ > 17)  out.print(1);  if(x == 16 | (++x==16) )  out.print(2);  out.println(x); |
| Question 23 xx  What is output by the line marked **//line1** ?  A. 10 B. 5 C. 20 D. 0 E. 2 | public class Building  {  static int buildingCount;  int sqFt;  public Building(int x)  {  sqFt = x;  }    private Building()  {  buildingCount++;  }    public String toString()  {  return ""+sqFt;  }  }  public class SkyScraper extends Building  {  static int buildingCount;  int sqFt;    public SkyScraper(int x)  {  super(x);  sqFt = x\*2;  }    public String toString()  {  return ""+sqFt;  }  }  /////////////////////////////////  //CLIENT CODE  Building b = new Building(5);  SkyScraper s = new SkyScraper(10);  out.println(s); **//line1**  out.println((Building)s); **//line2**  out.println(b.buildingCount); **//line3** |
| Question 24 xx  What is output by the line marked **//line2** ?  A. 5 B. 10 C. 20 D. 1 E. 2 |
| Question 25 xx  What is output by the line marked **//line3** ?  A. 2 B. 0 C. 1 D. 5 E. 3 |

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| Question 26 xx  What is output by the code to the right?  A. [1, 0, 0, 0, 0, 1]  B. [0, 0, 0, 0, 0, 0]  C. [1, 0, 0, 0, 0, 0]  D. [0, 0, 0, 0, 0, 1]  E. There is no output due to a runtime error | int[] arr = new int[6];  arr[5]++;  int[] arr2 = arr;  arr2[0]++;  arr2 = new int[6];  out.println(Arrays.toString(arr)); |
| Question 27 xx  What is output by the line marked **//line1** ?  A. 4 B. 12 C. 8 D. 20 E. 0 | public static int recur(int x, int a)  {  if(x<0)  return a;  return recur(x-2,a) + recur(x-4,a);  }  //////////////////////////////////  //CLIENT CODE  out.println(recur(3, 4)); **//line1**  out.println(recur(10, 3)); **//line2** |
| Question 28 xx  What is output by the line marked **//line2** ?  A. 36 B. 60 C. 39 D. 63 E. 66 |
| Question 29 xx  What is output by the code to the right?  A. 15 B. 101 C. 26 D. 401 E. 3 | String x = Integer.toString(10,3);  out.println(Integer.parseInt(x,5)); |
| Question 30 xx  What is output by the code to the right?  A. 0 1 2 3  B. 1 2 3  C. 0 0 0 0  D. 3 2 1  E. 3 2 1 0 | Stack<Integer> s = new Stack<>();  Queue<Integer> q= new LinkedList<>();  s.push(0);  s.push(1);  s.push(2);  s.push(3);  while(!s.isEmpty())  q.add(s.pop());  while(!q.isEmpty())  out.print(q.poll()+" "); |
| Question 31 xx  What is output by the code to the right?  A. [7, 8, 9, 10, 11, 14]  B. [7, 9, 8, 10, 11, 14]  C. [7, 8, 9, 10, 11, 14]  D. [14, 10, 8, 11, 7, 9]  E. [7, 9, 8, 11, 10, 14] | PriorityQueue<Integer> p;  p = new PriorityQueue<>();  p.add(9);  p.add(7);  p.add(8);  p.add(11);  p.add(10);  p.add(14);  out.println(p); |

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| Question 32 xx  What is output by the code to the right?  A. 6 B. 5  C. 3 D. 4  E. 2 | TreeSet<String> s = new TreeSet<>();  s.add("A");  s.add("B");  s.add("C");  s.add(s.first()+s.last());  s.add("A");  s.add("C");  out.println(s.size()); |
| Question 33 xx  What is output by the code to the right?  A. 1 B. true  C. 0 D. false  E. There is no output due to a runtime error. | LinkedList<Integer> L;  L = new LinkedList<>();  ArrayList<Integer> A;  A = new ArrayList<>();  L.add(5);  L.add(2);  L.add(3);  A.addAll(L);  out.println(L.equals(A)); |
| Question 34 xx  What is output by the code to the right?  A. 1 B. 0 C. -1 D. 2 E. 4 | int x = Integer.MIN\_VALUE>>>31;  out.println(x); |
| Question 35 xx  What is output by the code to the right?  A. 13+512+-25\*5012--56  B. ($1)+($1)+($1)\*($1)-($1)  C. (13)+(512)+-(25)\*(5012)--(56)  D. (13)+(512)+(-25)\*(5012)-(-56)  E. There is no output due to a runtime error. | String s="13+512+-25\*5012--56";  String r="($1)";  String q=s.replaceAll("(-?\\d+)", r);  out.println(q); |
| Question 36 xx  What is the postorder traversal of the binary tree made by inserting the word BINARY using the traditional insertion method?  A. BIANRY  B. AYRNIB  C. BAINRY  D. ABINRY  E. YRNIBA | |
| Question 37 xx  How many edges does a complete graph with 5 nodes have?  A. 10  B. 20  C. 5  D. 25  E. 12 | |

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| Question 38 xx  Which of the following is the worst case runtime for quicksort?  A. O(N)  B. O(logN)  C. O(NlogN)  D. O(N^2)  E. O([NlogN]^2) |
| Question 39 xx  Simplify the boolean expression |
| Question 40 xx  Give the decimal value of the following signed twos complement byte   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | |