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| **UIL Computer Science Written Test** |

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| **Note:** Correct responses are based on **Java SE Development Kit 8 (JDK 8)** from Sun Microsystems, Inc. All provided code segments are intended to be syntactically correct, unless otherwise stated (e.g., “error” is an answer choice) and any necessary Java SE 8 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 using:**  **import static java.lang.System.\*;** |

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| Question 1xxx  Which of the following is equivalent to CF16 + 9116 | |
| Question 2xxx  What is output by the code segment to the right? | System.out.println((2 – 3) \* 2 % 3); |
| Question 3xxx  What is output by the code segment to the right? | System.out.printf("%-7.3s|%.1f",  "123.30", 3.0); |
| Question 4xxx  What is output by the code segment to the right? | String s = "123 abc 123 baby you and MEEE";  System.out.println(s.toLowerCase()); |
| Question 5xxx  What is output by the code segment to the right? | int[] a = new int[5];  a[3] = a[4] = a[1] = 2;  System.out.println(Arrays.toString(a)); |
| Question 6xxx  What is output by the code segment to the right? | int alamo = 3;  int texas = 11;  texas /= alamo + 1;  System.out.println(texas – alamo); |
| Question 7xxx  What is output by the code segment to the right? | boolean p = <1>  boolean q = <2> System.out.println((!p && !q) == !(p || q)); |
| Question 8xxx  What is output by the code segment to the right? | int abc = 123;  if (abc % 10 == 3)  System.out.println(1);  if (abc % 100 == 1)  System.out.println(2);  System.out.println(3); |
| Question 9xxx  What is output by the client code below?  System.out.println(new Thing(4));  Question 10xxx  What is output by the client code below?  Object e = new Thing(3);  System.out.println(e.toString()); | class Thing {  int val;  Thing thong;  Thing thang;  Thing(int a) {  val = a;  if(a > 0) {  thong = new Thing(a – 1);  thang = new Thing(a – 2);  }  }  public String toString() {  return thong.val + " " + val + " " + thang.val;  }  } |
| Question 11xxx  What is output by the code segment to the right? | int n = 63;  int m = 64;  System.out.println(m << 2 & n); |
| Question 12xxx  What the Java order of precedence for the operators to the right? | 1. (cast) 2. ++ (post increment) 3. \* 4. << |
| Question 13xxx  What is output by the code segment to the right? | System.out.println(Double.SIZE); |
| Question 14xxx  What is output by the code segment to the right? | double d = 123.3;  double d2 = Math.floor(d);  double d3 = Math.ceil(d);  System.out.println(d3 – d); |
| Question 15xxx  What is output by the code segment to the right? | ArrayList<Long> ll = new ArrayList<>(); for (int i = 1; i <= 7; i += 2)  ll.add((long) i);  for (int i = 3; i >= 0; i--)  ll.set(i, ll.get(ll.size() – i – 1));  System.out.println(ll); |
| Question 16xxx  What is output by the code segment to the right? | Integer a = 200;  int b = 200;  System.out.println(a == b);  System.out.println(a.compareTo(b)); |
| Question 17xxx  What is output by the code segment to the right? | String mess = "123^456^789-1";  System.out.println(  mess.split("[^-]").length); |
| Question 18xxx  What is output by the code segment to the right? | String name = "Bobby Billy Jenkins";  char[] out = new char[4];  int num = 0;  Arrays.fill(out, 'a');  for(char c : name.toCharArray()) {  if( c > 95)  out[num++ % out.length] += 1;  System.out.print(Arrays.toString(out));  System.out.println(" – " + num); |
| Question 19xxx  What is output by the code segment to the right? | ArrayList<String> al = new ArrayList<>();  al.add("1"); al.add("A");  al.add("@"); a.add("{");  Iterator it = al.iterator();  while(it.hasNext())  System.out.print(it.next()); |
| Question 20xxx    What is the best case runtime of an insertion sort? | |
| Question 21xxx  What is output by the code segment to the right? | long l = 3;  while(l < 200) {  System.out.println((l \*= 2) + ", ");  } |
| Question 22xxx  What is output by the code segment to the right? | LinkedList<Integer> y = new LinkedList<>();  y.add(3); y.add(2);  y.add(5); y.add(0);  y.add(9);  Collections.sort(y, Collections.reverseOrder());  System.out.println(y); |
| Question 23xxx  What is output by the code segment to the right? | System.out.printf("%+.03f", 192.0); |
| Question 24xxx  What is output by the code segment to the right? | int result = -1;  switch(result) {  case -1: result += 3; break;  case 2: result \*= -1;  case 3: result++;  }  System.out.println(result); |
| Question 25xxx  What is output by the code segment to the right? | IntStream a = IntStream.of(1, 2, 3, 4, 5);  int i = a.map(x -> x\*2).sum();  int j = a.map(x -> x\*3).sum();  System.out.println(j – i); |
| Question 26xxx  What is output by the code segment to the right? | Stream<Integer> s = Stream.of(1, 7, 2, 3, 6, 9, 5);  Function<Integer, Integer) a = x -> x\*2;  Predicate<Integer> b = x -> x % 3 == 1;  Function<Integer, Integer> c = x -> x+1;  System.out.println(s.map(c.compose(a))  .distinct().filter(b)  .reduce((x,y) -> x^y).get()); |
| Question 27xxx  What is output by the code segment to the right? | int a = Stream.of(new int[] {1,2,3}).count();  int b = Stream.of(new int[][] {{1},{2},{3}}).count();  int c = Stream.of(new int[][][] {{{1}},{{2}},{{3}}}).count();  System.out.println(a \* b \* c); |
| Question 28xxx  What is output by the code segment to the right? | Stack<Integer> q = new Stack<Integer>();  st.add(3); st.add(5);  st.add(3); st.add(7);  st.add(-1);  System.out.println(  st.get(2) + " " + st.indexOf(3)); |
| Question 29xxx  What is output by the code segment to the right? | int n = 15;  int count = 0;  for(int i = 0; i < n; i++) {  for (int j = 3; j < 2 \* n; j++) {  for (int q = j; q >= 0; q--) {  count++;  }  }  }  System.out.println(count); |
| Question 30xxx  What is output by the code segment to the right? | ArrayList<Integer> a = new ArrayList<Integer>();  for(int r = 0; r < 5; r++)  a.add(r + 1);  ArrayList<Integer> b = new ArrayList<>();  b.addAll(a); a.clear();  System.out.println(b); |
| Question 31xxx  Which of the following lines will compile   1. Structure<Integer> s1 = new Structure<>(3); 2. Structure<Structure> s2 = new Structure<>(null); 3. Structure<Object> s3 = new Structure<>("A"); | class Structure<E extends Comparable> {  ArrayList<E> vals;  Structure(E initial) {  vals = new ArrayList<>();  vals.add(initial);  }  void add(E val) {  vals.add(  vals.get(0).compareTo(val)+1, val);  }  E remove() {  vals.remove(vals.size() – 1);  }  public String toString() {  return vals.toString();  }  }  Structure<Integer> s = new Structure(1);  s.add(3); s.add(2);  s.add(9); s.add(5);  System.out.println(s); \\1  System.out.println(s.remove() + " " + s.remove()); \\2 |
| Question 32xxx  What is output by the line to the right marked //1 ? |
| Question 33xxx  What is output by the line to the right marked //2 ? |
| Question 34xxx  The code to the right demonstrates which of the following Java concepts?   1. Generics 2. Overloading 3. Overriding |
| Question 35xxx  What is output by the code segment to the right? | System.out.println(Math.log(Math.exp(4)); |
| Question 36xxx  Reduce the following boolean expression  (A && !(A || !B) ^ A ^ (!A && (!A || B))) ^ (A && !(A || !B) ^ A ^ (!A && (!A || B))) | |
| Question 37xxx  What is output by the code segment to the right? **A)** a **B)** b  **C)** b **D)** c  **E)** d | TreeMap<Integer, String> map = new TreeMap<>();  for(int i=1;i<=4;i++) map.put(i, "" + (char)(i+64));  System.out.println(map.headMap(3)); |
| Question 38xxx  What is the 8 bit two’s complement representation of -21? | |
| Question 39xxx  What is the maximum number of edges in a tree with N nodes? | |
| Question 40xxx  Solve the following prefix equation  \* \* + \* 3 4 3 \ 9 7 + 2 3 | |