For each question select the best answer. All questions are worth 1 point. The last three questions will have any answer counted as correct.

**Problem 1.** Which of the following is the worst case time complexity of merge sort?

a) $O(n)$  b) $O(n \lg n)$  c) $O(n^2)$  d) $O(n^3)$  e) $O(n^3)$

**Problem 2.** Which of the following is the average case time complexity of merge sort?

a) $O(n)$  b) $O(n \lg n)$  c) $O(n^2)$  d) $O(n^3)$

**Problem 3.** Which of the following is the worst case time complexity of quick sort?

a) $O(n)$  b) $O(n \lg n)$  c) $O(n^2)$  d) $O(n^3)$

**Problem 4.** Which of the following is the average case time complexity of quick sort?

a) $O(n)$  b) $O(n \lg n)$  c) $O(n^2)$  d) $O(n^3)$

**Problem 5.** Which of the following is the worst case time complexity of radix sort?

a) $O(n)$  b) $O(n \lg n)$  c) $O(n^2)$  d) $O(n^3)$

**Problem 6.** Which of the following is the average case time complexity of radix sort?

a) $O(n)$  b) $O(n \lg n)$  c) $O(n^2)$  d) $O(n^3)$

**Problem 7.** If you performed two passes of bucket sort on the array 101 010 001 100 111 110 what would be the result?

a) 001 010 101 100 111 110  b) 100 001 101 010 110 111
c) 101 010 001 100 111 110  d) 110 111 100 001 010 101
e) 110 111 100 101 010 001

**Problem 8.** If you performed two passes of radix sort on the array 101 010 001 100 111 110 what would be the result?

a) 001 010 101 100 111 110  b) 100 101 001 010 110 111
c) 101 010 001 100 111 110  d) 110 111 100 001 010 101
e) 110 111 100 101 010 001
Problem 9. Which of the following statements is true of java?

a) A class can extend an interface.
b) A class can extend two other classes.
c) An interface must contain a method with signature line public static void main(String args[]).
d) Every interface must extend an abstract class.
e) To implement an interface a class must contain code for every method in the interface.

Problem 10. Which of the following statements is not true of java?

a) Every class either directly or indirectly extends object.
b) Java contains a class java.util.Vector.
c) Exceptions are thrown to indicate an incorrect action is being attempted.
d) Exceptions can cause interfaces to become abstract classes.
e) An interface cannot contain the code for some of its methods.

Problem 11. Why would you want to use an interface?

a) good way to structure a large project.
b) allows different programmers to work on different pieces of a project independently.
c) classes can be rewritten without needing to modify other classes.
d) easier to debug individual pieces.
e) All of the above

Problem 12. If a stack initially contains 5 items and 4 items are pushed and 3 item are popped then the number of items on the stack is

a) 3   b) 4   c) 5   d) 6   e) 12

Problem 13. If 2 people enter an empty building and later 3 people leave the building which of the following is true?

a) A measurement error was made
b) Reproduction occurred
c) Later someone will enter the building to make it empty again
d) Someone else must have entered surreptitiously
e) The people exiting must have been only 2/3 the size of those entering

Problem 14. Why are you in college?

a) Avoiding world.  b) Want to learn.  c) Training for high paying job.  d) Parents forcing me.  e) Beer

Problem 15. Is anyone a slower grader than Noga?

a) No   b) No, not even close   c) Theoretically it could happen   d) Woodchuck   e) Yes, just kidding, no