1. List one or more phases of the Waterfall life-cycle in which program optimization should be done.

   - design - selection of algorithms, language(s)
   - coding - profiling, low-level optimization, trial-and-error, unit-testing
   - partial credit given for some other answers.

2. In which phase of a software project is unit-testing done?

   - coding (implementation) - the programmer does unit-testing
   - partial credit given for some other answers.

3. Choose one or more below that form a true statement.

   Acceptance testing

   A. is done by programmers.
   B. is done by users.
   C. is done by the program designers.
   D. is done during implementation.
   E. requires no knowledge of the code.
   F. demands knowledge of the design.
   G. assumes knowledge of the requirements.

4. In Alex's lecture on unit testing of software, we learned that there are three major parts to a unit test. What are they?

   1. ___ setup a test scenario (isolated from the code being tested)
   2. ___ know what the expected outcome should be (test data)
   3. ___ compare actual outcome to expected (using an oracle)

   We did these 3 steps in our coding exam.

5. When a bug is discovered in our program, we begin the debugging process by attempting to repeat or duplicate the bug. This is called stabilization. What should we do next before trying to fix the code? One answer please.

   Localization.
   Locate the part of the code where the bug most likely is.
6. Choose things we learned about Microsoft at Friday's talk by Scott Hunter.

A. Microsoft offers internships for students.
B. You should at-least wear a tie when interviewing in-person.
C. Git and Github are used extensively at Microsoft.
D. Microsoft is not concerned with coding style or coding standards.
E. Microsoft's main office is moving to the Silicon Valley.
F. Microsoft employees do not use Macs.
G. The .NET framework is open-source.

7. Given the C/C++ array declaration below, write a for-loop that will assign each array element a unique odd number.

```c
int arr[100];

for (int i=0; i<100; i++)
    arr[i] = i * 2 + 1;
```

-no partial credit was given here
-must loop 100 times
-must populate all array values
-must use correct C/C++ syntax
-many other correct answers were accepted.

8. Give one advantage of the Waterfall life-cycle model.

-all system requirements are defined up front
-each phase must be completed before moving to the next
-the user is involved by signing-off each phase
-progress can be tracked
-final product is well documented

9. While coding a program, which utility or construct can be placed in the code temporarily to monitor program integrity?

A. goto
B. assert
C. debugging
D. exit(1)
E. typedef

10. Name one positive result of refactoring a program.

-improved readability, program is easier to understand, maintain
-program now follows required coding standards
-undiscovered bugs were found
-program runs more efficiently, but no change in functionality

Code optimization and refactoring are not the same thing. Optimization is a process, not an outcome. Scott from Microsoft did mention that the effort to optimize .NET was a refactoring one. The outcome is a faster-running system.