Exam 1 – Fall 2011 – Solution Notes

1. c

2. The other factor is that many companies that do not produce software in their everyday work have “drifted” into software development as their products and services have evolved. Consequently, their software is often more expensive and less reliable than it should be.

3. a

4. d

5. a. Long-lifetime systems may require *more design documentation* to communicate the original intentions of the system developers to the support team. Thus a plan based approach may be more appropriate for such systems.
   b. Agile methods are most effective when the system can be developed with a *small co-located team whose members can communicate informally*. This may not be possible for large systems so a plan-driven approach may have to be used.


7. Potentially changeable design decisions are isolated (i.e., “hidden”) to minimize the impact of change.


9. **GPL** is a reciprocal license that requires you to make your software open source if you use (GPL) open source software.

   **LGPL** allows you to write components that *link* to open source code without having to publish your components, but you must publish as open source any *changed* open source code that you use.

   **BSD** is a non-reciprocal license that does NOT require you to publish any changes or made to open source code. (You only need to acknowledge the original creator of any open source components used.)

10. false, true, false, false, false, true, true, false

11. **System integration**, which allows developers to define which components are required in each version of a system, and then use these definitions to build a system automatically by compiling and linking the required components


13. H, E, F, C, B, E, A, C, D, C

14. It means that the behaviour of a program when encountering a defect during a test run (e.g., termination with an error message) may obscure or completely eliminate any manifestation of other defects that would otherwise be observable.
15. These are behaviors that only become fully observable after the relevant components of the system have been integrated. For example, a high-level function that incorporates the capabilities of several components cannot be observed until those components are present. Similarly, the reliability of a system comprised of redundant components cannot be measured until all of the components are present.

16. The seemingly “hyperbolic step” is initially RUNNING (not just implementing) the test BEFORE the code is actually implemented:

17. Data clumps occur when the same group of data items reoccur in several places in a program. These can often be replaced with an object encapsulating all of the data (in one place).

18. a. Regression testing is the RE-RUNNING of one or more test cases after some program change that ran without revealing faults prior to the change.
   b. The purpose of regression testing is to determine if the change has “broken code” that worked correctly BEFORE the change.

19. a. A program that is used in a real-world environment must necessarily change, or else become progressively less useful in that environment.
   b. As an evolving program changes, its structure tends to become more complex. Extra resources must be devoted to preserving and simplifying the structure.

20. d

   **Histogram of Raw Scores**

   ![Histogram of Raw Scores](image)