Assignment 5

Multiple Choice Questions
1. Which of the following software engineering methodologies is the most rigid?
   A. Incremental model B. Waterfall model
   C. Extreme programming D. Evolutionary prototyping
2. Which of the following is most likely an example of a one-to-one relationship?
   A. Subscribers and magazines B. Birth dates and people
   C. Planets and their moons D. Dinner guests and table settings
3. Which of the following is not a feature of UML?
   A. Use case diagrams B. Class diagrams
   C. Dataflow diagrams D. Sequence diagrams
4. Which of the following is a form of glass-box testing?
   A. Basis path testing B. Boundary value analysis C. Beta testing
5. Which of the following is a way of testing the design of a software system?
   A. Entity-relationship diagram B. Class diagram
   C. Structure chart D. Structured walkthrough
6. Which of the following is the method proposed by UML for representing sequences of communication between objects?
   A. Class diagram B. Use case diagram
   C. Sequence diagram D. Generalization
7. Which of the following is not represented in a class diagram?
   A. Generalizations B. The methods within a class
   C. The attributes within a class D. The number of instances each class will have
8. Which of the following is least related to the Pareto principle?
   A. When it rains, it pours.
   B. Birds of a feather flock together.
   C. Better late than never.
9. Which of the following is the oldest approach to software development?
   A. Component architecture B. Waterfall model
   C. Open-source development D. Extreme programming
10. Which of the following is a stronger form of cohesion?
    A. Functional cohesion B. Logical cohesion

Fill-in-the-blank/Short-answer Questions
1. Identify the stage of software development in which each of the following activities is performed.
   A. _________________ Programming is conducted.
   B. _________________ Class diagrams are drawn.
   C. _________________ User needs are analyzed.
2. During the analysis stage of software development, user needs are identified in the form of non-technical _______________ that are then converted into technical _______________.
3. Prototyping occurs in two forms. In one, called _______________ prototyping the original prototype is slowly enhanced to become the final product. In the other, called _______________ prototyping, the original prototype is used as an “experimental” system that is ultimately discarded.
4. In an object-oriented design using UML, _______________ diagrams are used to represent classes and
their 

basic relationships, whereas _____________ diagrams are used to represent communication between 

objects.

5. In each of the following, indicate whether the information would be represented within a use case 

diagram, a class diagram, or a sequence diagram.

A. _________________ The methods within a class 

B. _________________ The ways in which the system will interact with its environment 

C. _________________ The manner in which its internal objects will interact 

D. _________________ Relationships among classes 

6. In each case below indicate whether the phrase relates to coupling or cohesion.

A. _________________ The interaction between modules 

B. _________________ Passing data from one module to another 

C. _________________ Ensuring that a module performs a unique task in its entirety 

7. In each case below indicate whether the activity is a form of glass-box testing or black-box testing.

A. _________________ Basis path testing 

B. _________________ Boundary value analysis 

C. _________________ Beta testing 

**General Format Questions**

1. Describe the data coupling represented by the following structure chart.

![Structure Chart](image)

2. Draw pictures showing how the array below appears in a machine's memory when stored in 

row major order and in column major order:

```
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
</tr>
<tr>
<td>I</td>
<td>J</td>
<td>K</td>
<td>L</td>
</tr>
</tbody>
</table>
```

3. The following table represents a portion of a linked list in a computer's main memory. Each 

entry in the list consists of two cells: The first contains a letter of the alphabet; the second contains 
a pointer to the next list entry. Alter the pointers so that the letter N is no longer in the list. Then 
replace the letter N with the letter G and alter the pointers so that the new letter appears in the list 
in its proper place in alphabetical order.

```plain
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
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</tr>
</tbody>
</table>
4. Suppose a queue implemented in a circular fashion is in the state shown in the diagram below. Draw a diagram showing the structure after the letters G and R are inserted, three letters are removed, and the letters D and P are inserted.

b. What error occurs in part (a) if the letters G, R, D, and P are inserted before any letters are removed?

5. Draw a diagram showing how the binary tree below appears in memory when stored without pointers using a block of contiguous memory cells as described in Section 8.2.

6. Suppose a homogeneous array with six rows and eight columns is stored in row major order starting at address 20 (base ten). If each entry in the array requires only one memory cell, what is the address of the entry in the third row and fourth column? What if each entry requires two memory cells?