**CSc 131**

**Computer Software Engineering**

**Fall 2021**

**Final Exam**

**Name: Ryan Farruggia Team Name: Data Pirates Section # 1**

***True/False Questions (2 points each). Mark each question either as True (T) or False (F) ----- (30 Points total)***

1. **False** Coupling indicates the degree of functional relatedness within a module.
2. **False** Cohesion is the measure of interdependency between modules.
3. **True** Component level design is the highest level of design.
4. **False** Software developers aim for high coupling and low cohesion.

1. **True** Information hiding increases the likelihood of side effects.
2. **False** UML State-Chart models data and control flow
3. **True** UML sequence diagram usually models multiple Use Cases at a time.
4. **False** Data design is about modeling the architectural view of the system.
5. **False** Architectural design is about transforming the information domain model into data structures.
6. **True** Modular design is one of the design fundamentals.
7. **False** Data coupling is the worst type of coupling.
8. **True** Modular design uses the concepts of “divide and conquer”
9. **True** The design phase focuses on and aims to answer the “How” question.
10. **True** Data design is derived from ERDs and data dictionaries.
11. **True** Sequence diagrams are useful to find interface and logic problems early in the design process.

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**Multiple Choices - Select the best answer (2 points each) ------ *(30 Points total)***



1. What is not true about “Information Hiding”?

1. It reduces the likelihood of side effects.
2. It leads to encapsulation.
3. **It emphasizes the use of global data.**
4. It results in higher quality software.
5. All of the above

**ANSWER: C**

2. Which of the following statement is not true about “Coupling”?

1. It defines the interconnection of modules.
2. It eliminates the unnecessary relationships.
3. **It is the measure of strength of functional relatedness of elements within modules.**
4. It is the degree of independence between the modules.
5. All of the above.

**ANSWER: C**

3. Which of the following is considered a benefit of Sequence Diagrams?

1. Sequence diagrams are valuable during design meetings because they allow you to discuss the design in concrete terms.
2. Sequence diagrams can be used to document the dynamic view of the system design.
3. Sequence diagrams model system behavior in real time.
4. **All of the above**
5. None of the above

**ANSWER: D**

4. Which design model transforms information domain model into data structures.

1. Architectural design.
2. Component-level design.
3. Interface design.
4. **Data design.**
5. None of the above.

**ANSWER: D**

5. In the design phase, which is the primary area of concern?

1. Architecture
2. Data
3. Interface
4. **All of the mentioned**
5. None of the above

**ANSWER: D**

6. The importance of software design can be summarized as:

1. Efficiency
2. Accuracy
3. **Quality**
4. Complexity
5. All of the above

**ANSWER: C**

7. Cohesion is an indication of the degree to which a module

1. Written more compactly
2. **Focuses on just one task or set of related tasks**
3. Able to complete its function in a timely manner
4. Connected to other modules
5. All of the above

**ANSWER: B**

1. Coupling is an indication of the degree to which a module
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6. None of the above

**ANSWER: D**

1. When multiple modules have read and write access to some global data, it is called
2. Content coupling
3. Stamp coupling
4. Data coupling
5. **Common coupling**
6. None of the above

**ANSWER: D**

1. When elements of module are grouped because the output of one element serves as input to another and so on, it is called \_\_\_\_\_\_.
2. Functional cohesion
3. Sequential cohesion
4. **Communicational cohesion**
5. Procedural cohesion
6. None of the above

**ANSWER: C**

1. Aggregation represents \_\_\_\_\_\_.
2. is a relationship
3. **part\_of relationship**
4. composed\_of relationship
5. none of above
6. All of the above

**ANSWER: B**

## The feature of the object-oriented paradigm which helps code reuse is \_\_\_\_\_\_\_.

## Object

## Class

## Inheritance

## Aggregation.

1. None of the above

**ANSWER: C**

## The desired level of coupling is \_\_\_\_\_\_\_\_.

## No coupling

## Control coupling

## Common coupling

## Data coupling

1. None of them

**ANSWER: D**

1. Composition represents \_\_\_\_\_\_.
2. is\_a relationship
3. part\_of relationship
4. **composed\_of relationship**
5. none of above
6. All of the above

**ANSWER: C**

1. One of the software design models discussed in class is/are:
2. Data model
3. Component model
4. Use Case model
5. **a and b**
6. None of the above

**ANSWER: D**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

## *Essay Questions – Answer in the space provided only - Be very clear and specific in your answers*

* 1. **Explain in detail** how NFR performance affects design and design decisions (relevant to coupling and cohesion) **(10)**

Non-functional requirements should do very little processing work, where performance requirements of NFR’s should be relatively low. The lower-level module does the majority of computation, IO handling, and other performance-intensive tasks. If the NFR’s are taking up too much performance, the system will bottleneck and suffer from faulty design and preparation. This may also lead to significantly more side effects and errors during testing.

* 1. Is the “number of defects” a sufficient metric to measure testing progress? **– (4)**

**ANSWER: Yes**

**Briefly** explain: **(one or two lines is sufficient**)

Once a certain number of defects is found, especially if they are mostly seeded errors, can be a good stopping point because these are critical problems that should be addressed before continuing with further testing.

* 1. What is being described: by the statement below (**one or two words needed) - (4)**

Input distribution used for selecting test cases may be flawed: **Reliability Estimation**

**Briefly** explain what this statement means: (**one line is sufficient)**

There may be some flawed data/input that is causing unreliable test cases to be chosen.

* 1. In an analysis of a vehicle rental system, the design team developed the following class: **(8)**

|  |  |
| --- | --- |
| **Vehicle Class** | **Operation** |
| **Attributes:** | Rent |
| Make | Trade |
| Year | Lease |
| Model | Insure |
| Color |  |
| License Plate |  |
| Date of rental |  |
| Date returned from rental |  |
| Kilometers traveled |  |
| Person renting |  |
| Insurance Policy Number |  |
| Date Policy issued |  |
| Policy Cost |  |
| Lease period |  |

Is this a good class to use in the design?

**ANSWER: Yes**

**Briefly explain** (one or two lines are sufficient)

The class is specific, detailed, and is prepared to dynamically accommodate all necessary data for future customers with any type of vehicle. It lists all the attributes and operations of the class.

* 1. Consider the statement below **(8)**

Software validation is a process for determining whether the software products of an activity fulfill the requirements or conditions imposed on them in the previous activities.

Is the above statement True or False?

**ANSWER: False**

**Briefly explain** (one line is sufficient)

Software validation is the process for determining whether the requirements and the finalized system product fulfills its intended use. The statement provided describes software verification, not validation.

* 1. Which of following is considered an object-oriented design model? **(6)** 
     1. Use Case
     2. **Sequence**
     3. DFDs
     4. ERDs
     5. a and b
     6. a, b, c, and d

**ANSWER: B**

**Briefly explain** (one or two lines are sufficient)

Sequence models aim to show the logical flow of the system and describe the flow of messages, events, and actions between two or more objects. There is nothing object oriented about Use Case Models or Entity Relationship Diagrams.