Software Engineering Midterm Answers:

1. **(0.5 points) What is Software Engineering?**

Software engineering is defined as a process of analyzing user requirements and then designing, building, and testing software application which will satisfy those requirements.

2. **2. (0.5 points) What is the 4+1 View method?**

(1) The 4 + 1 View Model is a predefined set of views for organizing the design and architecture of a system. It was developed in 1995 by Philippe Kruchten, formerly the Director of Process Development at Rational Software. The 4 + 1 View Model gets its name from the 4 primary views and 1 supporting view that are used to capture and communicate different aspects of the system.

(2) 4+1 is a view model used for "describing the architecture of software-intensive systems, based on the use of multiple, concurrent views". The views are used to describe the system from the viewpoint of different stakeholders, such as end-users, developers, system engineers, and project managers.

3. **3. (0.5 points) What is the difference between alpha and beta testing?**

Alpha Testing is a type of software testing performed to identify bugs before releasing the product to real users or to the public. Alpha Testing is one of the user acceptance tests.

Beta Testing is performed by real users of the software application in a real environment. Beta testing is one type of User Acceptance Testing.

Alpha Testing is done within the organization, while Beta Testing is done in the user's environment. During Alpha Testing only functionality and usability are tested, while during Beta Testing usability, functionality, security, and reliability are tested to the same depth.

Alpha Testing	Beta Testing
Alpha testing involves both the white box and black box testing.	Beta testing commonly uses black-box testing.
Alpha testing is performed by testers who are usually internal employees of the organization.	Beta testing is performed by clients who are not part of the organization.
Alpha testing is performed at the developer's site.	Beta testing is performed at the end-user of the product.
Reliability and security testing are not checked in alpha testing.	Reliability, security and robustness are checked during beta testing.
Alpha testing ensures the quality of the product before forwarding to beta testing.	Beta testing also concentrates on the quality of the product but collects users input on the product and ensures that the product is ready for real time users.
Alpha testing requires a testing environment or a lab.	Beta testing doesn't require a testing environment or lab.

4. **(0.5 points) What kind of processes are there in Software Testing?**
There are a total of four stages of software testing, which include Unit Testing, Integration Testing, System Testing, and Acceptance Testing. With that said, these four stages can be collectively categorized into two types, the first two being verification stages while the last two are a part of the validation stage.

5. **5. (0.5 points) What is Agile software development?**

Agile is a term used to describe approaches to software development emphasizing incremental delivery, team collaboration, continual planning, and continual learning, instead of trying to deliver it all at once near the end.

Agile focuses on keeping the process lean and creating minimum viable products (MVPs) that go through a number of iterations before anything is final. Feedback is gathered and implemented continually and in all, it is a much more dynamic process where everyone is working together towards one goal.

6. **6. (0.5 points) What are Product Requirements?**

Aside from the customer needs - the **product's requirements** include all functions, features and behaviors that the product must possess, so that it will be efficient, ease to use, safe, low cost, etc. In other words - any function, constraint or other property that is required in order to satisfy user's needs. User requirements are gathered from users and described from the analyst with a customer point of view.

7. **7. (0.5 points) What is the main difference between Requirement Elicitation and Requirements Specification?**

REQUIREMENT VERSUS **SPECIFICATION**
IN SOFTWARE ENGINEERING

2 KEY DIFFERENCES

Requirements are descriptions of services that a software system must provide and the constraints under which it must operate.	Specification is a technical document that describes the features and behavior of a software application.
Requirements help to describe what the software should do.	Specification helps to get a clear understanding of the product to develop it and to minimise software failures.
Click here to go to main differences	Visit www.differencebetween.com

8. **8. (0.5 points) Why do some companies like Apple pay more attention to System Modeling for their products?**
Apple's Marketing is Built on Simplicity
That's how Apple has consistently positioned their marketing, keeping messaging and visuals simple. Most of the marketing is free of things like feature lists, pricing, or expensive special effects. They know the product will sell itself without relying on pomp and circumstance.

9. **9. (0.5 points) What are Software Design Patterns?**
Design patterns are used to represent some of the best practices adapted by experienced object-oriented software developers. A design pattern systematically names, motivates, and explains a general design that addresses a recurring design problem in object-

oriented systems. It describes the problem, the solution, when to apply the solution, and its consequences. It also gives implementation hints and examples.

10. **10. (0.5 points) What is the Context model in System Modeling?**

Context models are simple communication tools used to depict the context of a business, a system, or a process. **Context models** are used to illustrate the operational context of a system - they show what lies outside the system boundaries.

11. **11. (0.5 points) Why is Test-Driven Development convenient in the modern software engineering field?**

TDD results in giving more flexible and extensible code. The Test-Driven Development approach is widely used in our development process because the testing modules are built into the continuous integration development model, hence by using a TDD approach, we can easily make changes to our applications without the fear of 'breaking' the application. Test-driven development is the methodology that makes such flexibility, maintainability, and extensibility possible. For our internal development process, we rely on PHPUnit, Codeception, and Selenium.

12. **12. (0.4 points) What is the difference between Functional & Non-Functional Requirements?**

Functional requirements explain how the system must work, while non functional requirements explain how the system should perform.

13. **13. (0.5 points) Which is not included Requirements engineering processes:**

a) Requirements Elicitation

b) Requirements Storytelling

c) Requirements Validation

d) Requirements Specification

14. **14. (0.5 points) What is the Ethnography in Requirement Elicitation?**

Ethnography, it is an elicitation technique that supports context-aware requirements elicitation. Common tools used in requirements elicitation process are mostly desktop-based which decrease the mobility features of bringing them to workplace.

15. **15. (0.5 points) How do companies get the benefit and earn money by providing open-source software solutions?**

Paid extra features or functionalities

Some companies make money with open source in this way: they distribute their software for free, but charge money for additional features, functionalities, or updates.

16. **16. (0.5 points) What is not a widely used UML diagram?**

a) Activity Diagram

b) Use Case Diagram

c) Class Diagram

d) Component Diagram