DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE
Regular/Supplementary Winter Examination – 2024

Course: Computer Engineering
Subject Code & Name: BTCOC501: Software Engineering
Branch: Computer Engineering
Semester: V

Time: 3 Hours Max. Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary.

Q.1 Choose the correct answer for the following Multiple Choice Questions.

1. Which of the following is the first step in the Software Development Life Cycle (SDLC)? (1)

   a) Testing b) Design c) Requirement Gathering d) Implementation

2. Software engineering is a discipline that integrates which of the following fields? (1)

   a) Computer Science and Management Science b) Computer Science and Information Science c) Management Science and Economics d) Information Science and Economics

3. Which of the following is a characteristic of a good requirement? (1)

   a) Ambiguous b) Incomplete c) Testable d) General

4. Which requirements elicitation technique involves observing users in their natural environment? (1)

   a) Interviews b) Questionnaires c) Ethnography d) Brainstorming

5. What is the purpose of requirements validation? (1)

   a) To ensure the requirements are implemented correctly b) To ensure the requirements are complete and consistent c) To ensure the software meets performance criteria d) To manage changes to the requirements

6. Which of the following is NOT a requirement management activity? (1)

   a) Requirements Elicitation b) Requirements Traceability c) Change Control d) Status Tracking

7. Which model describes the system's environment and boundaries? (1)

   a) Interaction Model b) Structural Model c) Context Model d) Behavioral Model

8. Which UML diagram shows the interactions between objects over time? (1)

a) Class Diagram b) Use Case Diagram c) Sequence Diagram d) Activity Diagram

9. A state diagram is an example of which type of modeling? (1)

   a) Structural Modeling b) Behavioral Modeling c) Data Modeling d) Context Modeling

10. What is the main focus of Model-Driven Development (MDD)? (1)

    a) Writing code manually b) Automating code generation from models c) Creating detailed documentation d) Focusing on user interface design

11. Which design principle promotes loose coupling between components? (1)

    a) High Cohesion b) Low Coupling c) Abstraction d) Encapsulation

12. Which pattern provides a way to access the elements of an aggregate object sequentially without exposing its underlying representation? (1)

    a) Observer b) Iterator c) Factory d) Singleton

Q.2 Solve the following:

A) Explain the concept of requirements engineering and its importance in software development. (6)

B) Discuss the different types of software requirements document (SRD) and their respective contents. (6)

Q.3 Solve the following:

A) Describe various requirements elicitation techniques with their advantages and disadvantages. (6)

B) Explain the different activities involved in requirements validation, including inspections and prototyping. (6)

Q.4 Solve any TWO of the following:

A) What is system modeling? Explain its significance in software development and different stakeholders involved. (6)

B) Describe the different types of UML diagrams with their purposes and provide examples of their usage. (6)

C) Explain the concept of behavioral modeling with suitable examples, including state diagrams and activity diagrams, and their relation to system states. (6)

Q.5 Solve any TWO of the following:

A) Describe different architectural styles, such as layered, client-server, and microservices, and their advantages/disadvantages. (6)

B) What are architectural design patterns? Explain their role in creating robust and scalable systems with examples. (6)

C) Explain the importance of architectural documentation and different views used to represent the architecture. (6)

Q.6 Solve any TWO of the following:

A) Explain the different categories of design patterns (creational, structural, behavioral) and provide examples for each category. (6)

B) Describe the benefits of using design patterns in software development, such as reusability, maintainability, and flexibility, along with potential drawbacks. (6)

C) Discuss the application of design patterns in real-world software systems, providing specific examples of how different patterns are used to solve common design problems. (6)

Best of Luck!