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)?
   a) Design
   b) Implementation
   c) Requirements Gathering
   d) Testing (1)

2. What is the purpose of a feasibility study in software engineering?
   a) To estimate the cost of the project
   b) To determine if the project is technically and economically viable
   c) To create a project schedule
   d) To allocate resources to the project (1)

3. Which of the following is a characteristic of a good requirement?
   a) Ambiguous
   b) Testable
   c) Vague
   d) Complex (1)

4. What is the goal of requirements validation?
   a) To ensure that the software meets the user's needs
   b) To ensure that the requirements are consistent and complete
   c) To identify and resolve errors in the code
   d) To manage changes to the requirements (1)

5. Which of the following is a technique for requirements elicitation?
   a) Brainstorming
   b) Code review
   c) Unit testing

d) System integration (1)

6. What is the purpose of a requirements traceability matrix?
   a) To track the progress of the development team
   b) To ensure that all requirements are implemented and tested
   c) To manage changes to the project schedule
   d) To allocate resources to the project tasks (1)

7. Which of the following models represents the relationships between different parts of a system?
   a) Context Model
   b) Interaction Model
   c) Structural Model
   d) Behavioral Model (1)

8. What type of diagram is used to describe the interactions between actors and a system?
   a) Class diagram
   b) Sequence diagram
   c) Use case diagram
   d) State diagram (1)

9. Which modeling technique is used to describe the dynamic behavior of a system?
   a) Data flow diagramming
   b) Entity-relationship modeling
   c) State machine modeling
   d) Object-oriented modeling (1)

10. What is the primary focus of architectural design?
    a) Code optimization
    b) System structure and organization
    c) User interface design
    d) Database design (1)

11. Which design pattern promotes loose coupling between objects?
    a) Singleton
    b) Factory
    c) Observer
    d) Adapter (1)

12. Which of the following is a creational design pattern?
    a) Strategy
    b) Template Method
    c) Abstract Factory
    d) Iterator (1)

Q.2 Solve the following:

A. Explain the different phases of Requirements Engineering process. (6)

B. Describe the importance of stakeholder involvement in the requirements elicitation process. (6)

Q.3 Solve the following:

A. Discuss the challenges associated with managing changing requirements and how to mitigate them. (6)

B. Explain various techniques used for requirements validation, highlighting their strengths and weaknesses. (6)

Q.4 Solve any TWO of the following:

A. Explain the purpose of Interaction Models and describe sequence diagrams with an example. (6)

B. Describe Structural Models and explain class diagrams with its notations and relationships. (6)

C. What is Model-Driven Architecture (MDA)? Explain its benefits and challenges. (6)

Q.5 Solve any TWO of the following:

A. Explain the importance of architectural styles in software design. Discuss the benefits and drawbacks of layered architecture. (6)

B. Describe the client-server architecture and explain its advantages and disadvantages in different scenarios. (6)

C. What are the key considerations when choosing an appropriate architectural style for a software project? (6)

Q.6 Solve any TWO of the following:

A. Explain the Singleton design pattern with a real-world example and discuss its advantages and disadvantages. (6)

B. Describe the Factory design pattern and explain how it promotes loose coupling and code reusability. (6)

C. Discuss the Observer design pattern and its role in implementing event-driven systems. Provide a suitable example. (6)

Best of Luck!