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

- What is the primary goal of Software Engineering? (1)

a) Developing complex algorithms
b) Producing reliable and maintainable software
c) Writing efficient code
d) Creating visually appealing user interfaces

- Which of the following is a non-functional requirement example? (1)

a) User authentication
b) Database storage
c) Performance (e.g., response time)
d) Report generation

- What is the purpose of Requirements Elicitation? (1)

a) To validate the design
b) To gather requirements from stakeholders
c) To implement the code
d) To test the software

- Which of the following is a technique for Requirements Validation? (1)

a) Prototyping
b) Coding
c) Debugging
d) Compiling

- What is the role of Requirements Management? (1)

a) Controlling changes to requirements

b) Gathering initial requirements
c) Implementing the system
d) Testing the system

- Which of the following is a type of System Model? (1)

a) Interaction Model
b) Context Model
c) Structural Model
d) All of the above

- What does a Context Model represent? (1)

a) The system's internal components
b) The system's interactions with its environment
c) The system's data structures
d) The system's algorithms

- What is the focus of a Behavioral Model? (1)

a) System structure
b) System data
c) System dynamics and behavior
d) System interfaces

- What is Model-Driven Architecture (MDA)? (1)

a) An approach to software development based on models
b) A specific programming language
c) A testing methodology
d) A project management technique

- What is the purpose of Design Patterns? (1)

a) To provide reusable solutions to common design problems
b) To improve code readability
c) To optimize code performance
d) To simplify debugging

- Which is NOT a creational design pattern? (1)

a) Singleton
b) Factory Method
c) Observer
d) Abstract Factory

Q.2 Solve the following:

A. Explain the importance of requirements elicitation in software development. Describe different techniques used for requirements elicitation. (6)

- Discuss the challenges involved in managing changing requirements during the software development lifecycle. How can these challenges be mitigated? (6)

Q.3 Solve the following:

A. Describe the different activities involved in the Requirements Validation process. Explain the importance of each activity. (6)

- Explain the concept of a Software Requirements Specification (SRS) document. What are the key characteristics of a good SRS? (6)

Q.4 Solve any TWO of the following:

A. Explain the purpose of system modeling in software development. How does system modeling help in understanding and communicating system requirements and design? (6)

- Describe the different types of Interaction Models, including use case diagrams and sequence diagrams. Explain how these models are used to represent system behavior. (6)
- Explain the difference between a class diagram and a component diagram. Provide examples of when each diagram would be used. (6)

Q.5 Solve any TWO of the following:

A. Explain the concept of software architecture. Why is it important to have a well-defined software architecture? (6)

- Describe the layered architectural style and its advantages and disadvantages. Provide an example of a system that would benefit from this style. (6)
- What are architectural design patterns? Explain the Model-View-Controller (MVC) architectural pattern with a suitable diagram. (6)

Q.6 Solve any TWO of the following:

A. Explain the concept of design patterns. Why are design patterns useful in software development? (6)

- Describe the Singleton design pattern with a UML diagram and a code example. Explain the purpose of the Singleton pattern. (6)
- Explain the Observer design pattern with a UML diagram and a code example. Describe a scenario where the Observer pattern would be beneficial. (6)

Best of Luck!