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

Course: Computer Engineering **Subject Code & Name:** BTCOC503: Software Engineering **Branch:** Computer Engineering **Semester:** V

Time: 3 Hours **Max. Marks:** 80

Instructions:

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

Q.1: Multiple Choice Questions (1 mark each):

1. Which of the following is NOT a typical phase in the software development life cycle (SDLC)? (1) a) Requirements Gathering b) Testing c) Marketing d) Deployment
2. A use case diagram is primarily used to model: (1) a) Data flow b) System architecture c) User interactions d) Class relationships
3. What does UML stand for? (1) a) Unified Modeling Language b) Universal Markup Language c) User-Managed Library d) Unit Measurement Language
4. Which software development model emphasizes iterative development and incremental delivery? (1) a) Waterfall b) Agile c) Spiral d) Prototype
5. A software requirements specification (SRS) document primarily serves to: (1) a) Guide the testing process b) Describe the system's architecture c) Detail the system's functionality and constraints d) Plan the project timeline
6. Which of the following is a technique for requirements elicitation? (1) a) Unit testing b) Integration testing c) Interviews d) Code review
7. What is the purpose of a context diagram? (1) a) To detail the internal workings of a system b) To show the system's boundaries and interactions with its environment c) To model data flow within a system d) To represent the system's user interface
8. Which diagram is best suited for visualizing the collaboration between objects? (1) a) Class diagram b) Sequence diagram c) State diagram d) Activity diagram
9. What is the primary goal of software testing? (1) a) To prove the software is bug-free b) To identify defects and improve software quality c) To speed up the development process d) To enhance the software's user interface
10. What does CRUD stand for in the context of database operations? (1) a) Create, Read, Update, Delete b) Compile, Run, Update, Debug c) Control, Read, Use, Delete d) Create, Replace, Update, Delete
11. Which model is best suited for projects with evolving requirements? (1) a) Waterfall b) Agile c) Spiral d) V-model

12. Software validation is the process of: (1) a) Verifying that the software meets its specifications b) Ensuring the software is built correctly c) Verifying that the software meets the user's needs d) Testing individual components of the software

Q.2: (UNIT 1) Solve the following:

A) Define software requirements engineering. Explain the different types of software requirements with examples. (6) B) Describe the process of requirements elicitation and analysis. Discuss the challenges involved in gathering requirements from stakeholders. (6)

Q.3: (UNIT 2) Solve the following:

A) Explain the importance of a well-defined Software Requirements Specification (SRS) document. What are the key characteristics of a good SRS? (6) B) Discuss the various techniques used for requirements validation and verification. Give examples of each. (6)

Q.4: (UNIT 3) Solve any TWO of the following:

A) Explain the concept of system modeling and its importance in software development. Discuss different types of system models. (6) B) Describe the use of UML diagrams in system modeling. Explain the purpose and structure of at least three different UML diagrams. (6) C) What is behavioral modeling? Explain the use of state diagrams and activity diagrams in behavioral modeling with examples. (6)

Q.5: (UNIT 4) Solve any TWO of the following:

A) What are the key principles of software design? Explain the importance of modularity and abstraction in software design. (6) B) Compare and contrast different software design patterns (e.g., Singleton, Factory, Observer). Give examples of when you would use each. (6) C) Describe the concept of software architecture and its role in the software development lifecycle. Discuss different architectural styles. (6)

Q.6: (UNIT 5) Solve any TWO of the following:

A) Explain the importance of software testing in the software development lifecycle. Describe different levels of software testing (unit, integration, system, acceptance). (6) B) Discuss various software testing techniques, including black-box and white-box testing. Provide examples of each. (6) C) Explain the concept of software quality assurance (SQA) and its role in ensuring software quality. Discuss different SQA activities. (6)