

MIDTERM TEST - 2026

Course: CS 3332 – Software Engineering

Date: 17th April, 2026

Duration: 90 minutes

Total of pages:

Total marks: 100

Student name:

Student ID:.....

Note: - **Open book (Students can use any written publication or copy);**

- **Internetworking devices (mobiles, tablet computers, watches, and others) are not permitted.**

Q1. Multiple choice questions (20x2 points) - Circle the correct answer.

1.1.The Waterfall model is characterized by:

- Sequential phases, little iteration
- Flexible, continuous changes
- No documentation required
- Only used for small software

1.2.A good software process requires:

- Clear documentation
- Customer involvement
- Testing
- All of the above

1.3.In Agile, a “Sprint” is:

- A requirements document
- A testing tool
- A short development cycle
- A type of design

1.4.In Waterfall, if requirements change then:

- Easy to adapt
- Difficult, costly
- No impact
- No need to care

1.5.Requirement is:

- Requirement of systems
- Customer’s demand for the software
- User interface design
- Testing document

1.6.Requirement specification is:

- User interface design
- A technical requirement
- A document describing software requirements in detail
- Test plan

1.7.Software architecture design describes:

- Overall structure and main components of the system
- Architecture of individual programs
- System testing
- User interface design

1.8.Structural design helps:

- Write code faster
- Ensure the system is easy to maintain and extend

- No testing needed
- No customer needed

1.9. An important characteristic of software engineering is:

- Just writing code
- No testing needed
- Focus on process and quality
- No customer needed

1.10. Why is software often harder to maintain than hardware?

- Software is easy to change and requirements often fluctuate
- Software cannot be fixed
- Software has no documentation
- Software is unrelated to customers

1.11. The Spiral model combines:

- No testing needed
- Fast coding
- Iterative development and risk management
- No customer needed

1.12. Scrum defines main roles as:

- Tester, Designer, Manager
- Customer, Developer, Analyst
- Programmer, Tester, Architect
- Product Owner, Scrum Master, Development Team

1.13. Product backlog is:

- Detailed code
- User interface design
- A list of all product requirements and features
- Testing document

1.14. Use case helps:

- Write detailed code
- Design database
- Test the system
- Describe interactions between users and the system

1.15. State diagram describes:

- The system's responses
- Database design
- Software testing
- System states and transitions between them

1.16. During requirement elicitation, if you only rely on interviewing a small group of users, the risk is:

- No impact
- No need for testing
- No need for customers
- Requirements are incomplete and lack representativeness

1.17. In an activity diagram, if there are many complex loops, the risk is:

- Reduced performance
- Difficult testing and maintenance
- No customer needed
- No impact

1.18. Compare Waterfall and Iterative models:

- Waterfall is sequential, Iterative repeats and improves gradually

- Waterfall is flexible, Iterative is fixed
 - Both require no documentation
 - No difference
- 1.19. Compare Class diagram and Component diagram:**
- Class diagram shows classes and relationships, Component diagram shows software component structure
 - Class diagram shows UI, Component diagram shows data
 - Both are the same
 - Not needed in modelling
- 1.20. Compare Layered and Client-Server architectures:**
- Layered has clear separation of layers, Client-Server focuses on client-server relationship
 - Layered only for small systems, Client-Server for large systems
 - Both are the same
 - Not needed in design

Q2. (20 points): Using the technique suggested here, where natural language descriptions are presented in a standard format, write plausible user requirements for the following function: An unattended petrol (gas) pump system that includes a credit card reader. The customer swipes the card through the reader, then specifies the amount of fuel required. The fuel is delivered and the customer's account debited.

Q3. (20 points): Draw state diagrams of the control software for an automatic washing machine that has different programs for different types of clothes.

Q4. The dean of the Faculty of Engineering asks a company to develop a student management system for his faculty. Do the following:

Q4.1. (10 points): List 03 functional and 02 non-functional requirements.

Q4.2. (10 points): Draw 05 use case diagrams of the system. Among them, write 02 descriptions of use cases.
