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B.Tech / M.Tech (Integrated) DEGREE EXAMINATION, DECEMBER 2024
Fifth Semester

21CSC303J - SOFTWARE ENGINEERING AND PROJECT MANAGEMENT
(For the candidates admitted from the academic year 2021-2022 to 2023-2024)

Note:

- (i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
(ii) **Part - B & Part - C** should be answered in answer booklet.

Time: 3 hours

Max. Marks: 75

PART - A (20 x 1 = 20 Marks)
Answer **ALL** Questions

Marks BL CO PO

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|--|---|---|---|---|
| 1. Which SDLC model is also known as the "classic life cycle" or "linear sequential model"? | 1 | 1 | 1 | 9 |
| A) Spiral model | | | | |
| B) V Model | | | | |
| C) Waterfall model | | | | |
| D) Agile Model | | | | |
| 2. If a project requires heavy risk analysis and has a high level of uncertainty, which SDLC model would you choose? | 1 | 2 | 1 | 9 |
| A) Waterfall Model | | | | |
| B) Agile Model | | | | |
| C) Spiral Model | | | | |
| D) V-Model | | | | |
| 3. The Incremental Model of SDLC is characterized by | 1 | 2 | 1 | 9 |
| A) Delivering the entire software at once | | | | |
| B) Delivering software in small, workable sections called increments | | | | |
| C) Rigid phases that must be completed in order | | | | |
| D) Emphasizing extensive risk analysis before development | | | | |
| 4. In the Spiral Model, which of the following is a unique feature not found in the Waterfall Model? | 1 | 1 | 1 | 9 |
| A) Phased approach to software development | | | | |
| B) Iterative cycles that incorporate risk analysis | | | | |
| C) Early testing and validation | | | | |
| D) Customer involvement during the planning phase | | | | |
| 5. Requirements models also called as _____. | 1 | 2 | 2 | 9 |
| A) Analysis models | | | | |
| B) Design model | | | | |
| C) Maintenance model | | | | |
| D) Testing model | | | | |
| 6. _____ define priorities and establish project constraints. | 1 | 2 | 2 | 9 |
| A) Stakeholders | | | | |
| B) Software designer | | | | |
| C) Software developer | | | | |
| D) Customer | | | | |
| 7. In Requirements engineering, _____ task defines the scope and nature of the problem to be solved. | 1 | 2 | 2 | 9 |
| A) Inception | | | | |
| B) Elaboration | | | | |
| C) Construction | | | | |
| D) Transition | | | | |
| 8. The scenarios, often called _____, describe how the system will be used. | 1 | 2 | 2 | 9 |
| A) Inception | | | | |
| B) validation | | | | |
| C) Elicitation | | | | |
| D) Use cases | | | | |

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|-----|--|---|---|---|----|
| 9. | In the Design phase, which one is NOT the primary area of concern? | 1 | 1 | 3 | 9 |
| | A) Architecture B) Data | | | | |
| | C) Interface D) Security | | | | |
| 10. | The importance of software design can be summarized in a single word which is: | 1 | 2 | 3 | 9 |
| | A) Efficiency B) Accuracy | | | | |
| | C) Quality D) Complexity | | | | |
| 11. | Coupling is a qualitative indication of the degree to which a module | 1 | 2 | 3 | 9 |
| | A) can be written more compactly B) focuses on just one thing | | | | |
| | C) is able to complete its function in a timely manner D) is connected to other modules and the outside world | | | | |
| 12. | Identify one of the following tools used for structured designing _____. | 1 | 2 | 3 | 9 |
| | A) Program flowchart B) Structure chart | | | | |
| | C) Data-flow diagram D) Module | | | | |
| 13. | Effective testing will reduce _____ cost. | 1 | 2 | 4 | 11 |
| | A) Maintenance B) Design | | | | |
| | C) Coding D) Testing | | | | |
| 14. | Discussing, making decisions, evaluating alternatives and finding defects are the main purposes of _____ | 1 | 1 | 4 | 11 |
| | A) Informal review B) Walkthrough | | | | |
| | C) Inspection D) Technical review | | | | |
| 15. | _____ testing is appropriate for object-oriented systems in that individual objects may be tested using their own test drivers they are then integrated and the object collection is tested. | 1 | 2 | 4 | 11 |
| | A) Top-down B) Bottom-up | | | | |
| | C) Thread D) Stress | | | | |
| 16. | The output of the requirement analysis and the requirement specification is used as the input for writing _____ | 1 | 2 | 4 | 11 |
| | A) User Acceptance Test Cases B) User Rejection Test Cases | | | | |
| | C) Product Rejection Test Cases D) Product Acceptance Test Cases | | | | |
| 17. | Knowledge of software programs, design and structure is essential in _____ | 1 | 2 | 5 | 11 |
| | A) Black-box testing B) White-box testing | | | | |
| | C) Integration testing D) Regression testing | | | | |
| 18. | The process of transforming a model into source code is known as | 1 | 2 | 5 | 11 |
| | A) Forward engineering B) Reverse engineering | | | | |
| | C) Re-engineering D) Reconstructing | | | | |
| 19. | Reverse engineering is the process of deriving the system design and specification from its | 1 | 2 | 5 | 11 |
| | A) GUI B) Database | | | | |
| | C) Source code D) Object Code | | | | |
| 20. | Which of the following is NOT a typical step in the risk management process? | 1 | 2 | 5 | 11 |
| | A) Risk identification B) Risk assessment | | | | |
| | C) Risk avoidance D) Risk monitoring and control | | | | |

PART - B (5 x 8 = 40 Marks)
Answer ALL Questions

Marks BL CO PO

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|-------|--|---|---|---|---|
| 21 a. | Describe the key phases of the Waterfall model in the SDLC. How does each phase contribute to the overall software development process? Additionally, explain the primary differences between the Waterfall model and the Agile methodology. | 8 | 3 | 1 | 9 |
|-------|--|---|---|---|---|

(OR)

- b. Your company is considering adopting either Scrum or XP for its software projects. You are asked to prepare a report analyzing the strengths and weaknesses of both methodologies, particularly in handling rapidly changing requirements. 8 3 1 9
- 22 a. Describe the key requirement elicitation techniques commonly used in software development. How do interviews, questionnaires, and brainstorming sessions contribute to gathering requirements? 8 3 2 11

(OR)

- b. Compare and contrast the Basic, Intermediate, and Detailed COCOMO models. In what scenarios would you recommend using the Detailed COCOMO model over the Basic model? Provide examples of projects that might benefit from the additional complexity of the Detailed model. 8 3 2 11
- 23 a. List out the procedures to be followed while designing a use case. Develop a complete use case diagram for the following activities 8 4 3 11
- a. Making a withdrawal at an atm
- b. Searching books on a specific topic using an online bookstore

(OR)

- b. You are tasked with modeling a use case for an online banking system. Explain how sequence diagrams help in representing the flow of interactions, and then create a sequence diagram for the **Login, Check Balance, and Logout** use case 8 4 3 11
- 24 a. You are mentoring a group of junior developers who are unfamiliar with the concepts of desk checks, walkthroughs, and code reviews. Explain each practice and its importance in the software development process. 8 4 4 9

(OR)

- b. Evaluate the effectiveness of using white box testing techniques in a scenario where code coverage is critical. What are the potential risks and benefits of relying heavily on white box testing? Support your evaluation with examples. 8 4 4 9
- 25 a. Define the key components of a risk management strategy. What are the main steps involved in identifying, assessing, and mitigating risks in a project? 8 4 5 11

(OR)

- b. The legacy system your team is maintaining has frequent bugs and is incompatible with new software tools. Describe how you would apply corrective maintenance to fix the bugs and adaptive maintenance to improve the system's compatibility with current technologies. 8 4 5 11

PART - C (1 x 15 = 15 Marks)
Answer ANY ONE Question

Marks BL CO PO

26. Your team needs to deliver a minimum viable product (MVP) within three months for a startup. The requirements are expected to change frequently. Explain how using Scrum, particularly through effective user stories, sprints, and retrospectives, can help control and manage scope changes. 15 5 1 9
27. Design a set of manual test cases to thoroughly test the login functionality, covering both positive and negative scenarios. 15 5 4 11
- Successful login with valid credentials.
 - Attempted login with invalid credentials (incorrect username, incorrect password).
 - Login attempt with an account that has been locked due to multiple failed attempts.
 - Verification of CAPTCHA functionality after multiple failed login attempts.
 - Resetting the password using the "Forgot Password" option.

