

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Third Semester

Computer Science and Business Systems

24CBPC303– SOFTWARE ENGINEERING AND DESIGN

Regulations - 2024

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

	<i>Marks</i>	<i>K- Level</i>	<i>CO</i>
1. Which of the following is not a symptom of the present software crisis? a) Software is expensive. b) It takes too long to build a software product. c) Software is delivered late. d) Software products are required to perform very complex tasks.	1	K1	CO1
2. The implementation phase in the waterfall model is a synonym for which one of the following phases a) Coding and unit testing phase b) Integration and system testing phase c) Maintenance phased) Design phase	1	K1	CO1
3. Which of the following units is commonly used to measure effort? a) persons b) person-months c) months d) Rupees	1	K1	CO2
4. Who among the following is a stakeholder in a software development project? a) A shareholder of the organization developing the software b) Anyone who is interested in the software c) Anyone who is a source of requirements for the software d) Anyone who might be affected by the software	1	K1	CO2
5. Which of the following type of cohesion can be considered as the strongest cohesion? a) Logical b) Coincidental c) Temporal d) Functional	1	K1	CO3
6. The modules in a good software design should have a) High cohesion, low coupling b) Low cohesion, high coupling c) Low cohesion, low coupling d) High cohesion, high coupling	1	K1	CO3
7. Which UML diagrams should you use when allocating use case behavior to classes? a) Sequence and Communication diagrams b) Use Case and Activity diagrams c) Sequence and Activity diagramsd) Class and State Machine diagrams	1	K1	CO4
8. Which of the following is a characteristic of a good object-oriented design? a) Deep class hierarchy b) Large number of methods per class c) Large number of message exchanges per object d) High cohesion and low coupling among classes	1	K1	CO4
9. When is code review performed during software life cycle? a)After unit testing b) After coding and compiling c) During integration testing c) During system testing	1	K1	CO5
10. Which one of the following is the focus of modern quality paradigms? a) Process assurance b) Product assurance c) Thorough testing d) Thorough testing and rejection of bad products	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11. Define software engineering.	2	K1	CO1
12. What is configuration management?	2	K1	CO1
13. Infer the 'size' of a software project? Why does a project manager need to estimate the size of the project?	2	K2	CO2

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| 14. Compare requirements analysis and specification? | 2 | K2 | CO2 |
| 15. What do you mean by a modular design? | 2 | K1 | CO3 |
| 16. Interpret architectural mapping with data flow in brief. | 2 | K2 | CO3 |
| 17. List the principles of modeling in UML? | 2 | K1 | CO4 |
| 18. Tell the common uses of class diagram. | 2 | K1 | CO4 |
| 19. Compare black-box testing and white-box testing. | 2 | K2 | CO5 |
| 20. Explain Non-functional testing. | 2 | K2 | CO5 |
| 21. Define the terms software reliability and software quality | 2 | K1 | CO6 |
| 22. How can you determine the number of latent defects in a software product during the testing phase? | 2 | K1 | CO6 |

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

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| 23. a) | Outline in detail about the different Software Development Life Cycle (SDLC) models and explain their characteristics, advantages, and limitations. | 11 | K2 | CO1 |
| OR | | | | |
| b) | Explain the three key activities involved in risk management and risk mitigation. Provide an example to illustrate these activities and classify the types of risks identified in your example. | 11 | K2 | CO1 |
| 24. a) | Identify whether can you complete the project by employing 50 developers for one month? Justify your answer for the below task.
As the manager of a software project to develop a business application, if you estimate the effort required for completion of the project to be 50 person-months, | 11 | K3 | CO2 |
| OR | | | | |
| b) | Suppose the analyst of a large product development project has prepared the Software Requirements Specification (SRS) document in the form of a narrative essay describing the system to be developed. Based on this document, the product development activity begins. Identify the problems that may cause during software development. | 11 | K3 | CO2 |
| 25. a) | Explain the terms <i>cohesion</i> and <i>coupling</i> in the context of software design. Discuss their types and explain how the levels of cohesion and coupling affect the quality of software design. | 11 | K2 | CO3 |
| OR | | | | |
| b) | Summarize the concept of architectural design in software engineering. Discuss different architectural styles with examples. | 11 | K2 | CO3 |
| 26. a) | Construct a use case diagram for sales management system and highlight the significance of UML diagrams. | 11 | K3 | CO4 |
| OR | | | | |
| b) | Develop a Sequence and Collaboration Diagram to demonstrate the dynamic interactions among the Receptionist, Housekeeping Manager, Housekeeping Staff, and the System for updating room cleaning status. | 11 | K3 | CO4 |
| 27. a) | Experiment with Black-Box test cases for a program that validates a person's age for applying for a driving license. The valid age range is between 18 and 60 years. Identify the equivalence partitions and boundary values, and construct a complete test suite to verify all possible input conditions. | 11 | K3 | CO5 |

OR

b) Apply the concepts of Performance Testing to evaluate a banking web application that must handle 20,000 users simultaneously. Explain how you would design the test scenario, choose suitable tools, and interpret the results to ensure system efficiency. 11 K3 CO5

28. a) Demonstrate the concept of a Technical Stack in software engineering and discuss how it relates to the design of Component Diagrams and Package Diagrams in system architecture. 11 K2 CO6

OR

b) Show the concept of the Capability Maturity Model (CMM) and Classify the five maturity levels of the model with their key characteristics. 11 K2 CO6