Enrollment No.....................................

Faculty of Engineering / Science
End Sem Examination Dec 2024
CS3CO40 / BC3CO66 Software Engineering

Programme: B.Tech.   Branch/Specialisation: CSE All

Duration: 3 Hrs.   **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

		Marks	BL	PO	CO	PSO
Q.1	i. Which of the following software process models is characterized by its sequential approach, where each phase must be completed before the next phase begins? (a) Incremental model (b) Spiral model (c) Waterfall model (d) Rational unified process	1	4	1	4	1
	ii. The Rational Unified Process (RUP) is best described as- (a) Sequential design process with distinct stages (b) An iterative software development process framework (c) A model that emphasizes reusing existing components (d) A model specifically for small-scale projects	1	1	1	11	2
	iii. Which of the following requirement elicitation techniques involves stakeholders working together to generate ideas and solutions in a non-judgmental environment? (a) Interviews (b) Surveys (c) Brainstorming (d) Document analysis	1	1	2	11	2

		Marks				
Q.5	i. Define software quality and explain its significance in software development.	4	5	4	3	3
	ii. Explain the concepts of verification and validation in software testing and highlight their differences.	6	4	4	9	3
OR	iii. Describe the process of risk assessment in software development and explain how it contributes to risk management.	6	4	4	5	3
Q.6	Attempt any two:					
	i. Explain the concept of function point metrics and describe how it is used to estimate the size of a software project.	5	4	5	11	3
	ii. Describe the COCOMO model and its purpose in software project estimation.	5	4	5	11	3
	iii. Explain the concept of effort distribution in software project management and its impact on project planning.	5	4	5	3	3

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iv. In a Data Flow Diagram (DFD), which symbol is used to represent a process that transforms data within the system?   **1**   1 2 5 3
(a) Circle   (b) Rectangle
(c) Arrow   (d) Double line

v. Which principle of software design emphasizes separating concerns and reducing complexity by dividing a system into distinct sections?   **1**   1 2 3 3
(a) Cohesion   (b) Modularity
(c) Abstraction   (d) Encapsulation

vi. In software design, which concept refers to the simplification of a complex reality by modeling classes appropriate to the problem, thus allowing focusing on high-level details rather than specific implementations?   **1**   1 2 3 1
(a) Modularity   (b) Abstraction
(c) Coupling   (d) Design patterns

vii. Which type of software testing focuses on testing individual components or modules of a system in isolation?   **1**   1 3 9 1
(a) Integration testing
(b) System testing
(c) Unit testing
(d) Acceptance testing

viii. Which of the following activities involves identifying potential risks, analyzing their impact and likelihood, and prioritizing them?   **1**   1 1 4 1
(a) Risk mitigation
(b) Risk monitoring
(c) Risk assessment
(d) Risk management

ix. Which of the following metrics is used to measure the size of software in terms of the functionality provided to the user?   **1**   1 4 9 3
(a) Lines of Code (LOC)
(b) Function Points (FP)
(c) Cyclomatic complexity
(d) Code coverage

x. In the COCOMO model, which type of project is characterized by small teams, familiar and well-understood applications, and fewer requirements for innovation?   **1**   1 4 6 3
(a) Organic
(b) Semi-detached
(c) Embedded
(d) Hybrid

Q.2 i. What is the main difference between the Incremental model and the evolutionary model?   **2**   4 1 4 1

ii. Discuss the role of risk management in the Spiral model.   **3**   4 1 3 3

iii. Compare and contrast the waterfall model with the Rational Unified Process (RUP).   **5**   2 1 11 2

OR iv. Explain the Component-Based Software Engineering (CBSE) approach and its advantages in software development.   **5**   4 1 1 2

Q.3 i. What is a stakeholder in the context of requirement analysis?   **2**   4 2 5 3

ii. Explain various requirement elicitation techniques and their importance in the requirement analysis process.   **8**   4 2 9 1

OR iii. Explain the concept and purpose of Swimlane diagrams and provide an example of how they can be used in software development.   **8**   4 2 6 2

Q.4 i. Define the concept of modularity in software design and explain its importance.   **3**   5 3 1 2

ii. Discuss the role of abstraction in software design, including its types and benefits.   **7**   4 3 3 1

OR iii. Explain the concept of component design in software engineering and outline the key steps involved in designing a component.   **7**   4 3 9 3

Marking Scheme
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Q.1   i)   (c) Waterfall model   **1**

ii)   (b) An iterative software development process framework   **1**

iii)   (c) Brainstorming   **1**

iv)   (a) Circle   **1**

v)   (b) Modularity   **1**

vi)   (b) Abstraction   **1**

vii)   (c) Unit testing   **1**

viii)   (c) Risk assessment   **1**

ix)   (b) Function Points (FP)   **1**

x)   (a) Organic   **1**

Q.2   i.   What is the main difference between the Incremental model and the evolutionary model?   **2**
Two points each 2 mark

ii.   Discuss the role of risk management in the Spiral model.   **3**
Role of risk management 3 marks

iii.   Compare and contrast the waterfall model with the Rational Unified Process (RUP).   **5**
5 difference 5 marks

OR   iv.   Explain the Component-Based Software Engineering (CBSE) approach and its advantages in software development.   **5**
Approach 3 marks, advantages 2 marks

Q.3   i.   What is a stakeholder in the context of requirement analysis?   **2**
Definition 1 mark and example 1 mark

ii.   Explain various requirement elicitation techniques and their importance in the requirement analysis process.   **8**
Various techniques 4 marks, Importance 4 marks

OR   iii.   Explain the concept and purpose of Swimlane diagrams and provide an example of how they can be used in software development.   **8**
Concept 2 marks, Purpose 4 marks, example with explanation 2 mark

Q.4   i.   Define the concept of modularity in software design and explain its importance.   **3**
Concept 1 mark, Importance 2 mark

ii.   Discuss the role of abstraction in software design, including its types and benefits.   **7**
Role of abstraction 3 marks, types 2 marks, benefits 2 mark

OR	iii.	Explain the concept of component design in software engineering and outline the key steps involved in designing a component. **Concept 4 mark, steps 3 marks**	7

Concept 2.5 marks, impact 2.5 marks

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Q.5	i.	Define software quality and explain its significance in software development. **Quality 2 mark, Significance 2 marks**	4
	ii.	Explain the concepts of verification and validation in software testing and highlight their differences. **Concepts of verification 2 marks, Concepts of validation 2 marks, differences 2 marks**	6
OR	iii.	Describe the process of risk assessment in software development and explain how it contributes to risk management. **Process 4 marks, Contribution 2 marks**	6

Q.6		Attempt any two:	
	i.	Explain the concept of function point metrics and describe how it is used to estimate the size of a software project. **Concept 2.5 marks, usage 2.5 marks**	5
	ii.	Describe the COCOMO model and its purpose in software project estimation. **Description 2.5 marks, Purpose 2.5 marks**	5
	iii.	Explain the concept of effort distribution in software project management and its impact on project planning.	5