OR iii. Describe the object-oriented testing approach and its key principles. Discuss the challenges associated with testing object-oriented systems and how these challenges can be addressed effectively. **6**

Q.6 Attempt any two:

i. Explain the COCOMO (Constructive Cost Model) and its different variants. Discuss how COCOMO models can be used for software project estimation and resource allocation. **5**

ii. Discuss the process of risk assessment in software projects. Identify and explain various techniques used for identifying, analyzing, and prioritizing risks in software development. **5**

iii. Explain the concept of software metrics and its importance in software engineering. Discuss different types of metrics and how they can be used to measure and improve the quality and productivity of software development projects. **5**

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Total No. of Questions: 6 *Total No. of Printed Pages:4*

Enrollment No.....

Faculty of Engineering
End Sem Examination May-2024
IT3CO36 Software Engineering

Programme: B.Tech. Branch/Specialisation: IT

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.

Q.1 i. Which is the most important feature of spiral model? **1**

(a) Quality management
(b) Risk management
(c) Performance management
(d) Efficiency management

ii. Which of these software engineering activities are not a part of software processes? **1**

(a) Software dependency
(b) Software development
(c) Software validation
(d) Software specification

iii. Which diagrams are used to illustrate the interactions between objects visually? **1**

(a) UML Collaboration
(b) UML Package
(c) UML Class
(d) UML Activity

iv. What is a functional requirement? **1**

(a) Specifies the tasks the program must complete
(b) Specifies the tasks the program should not complete
(c) Specifies the tasks the program must not work
(d) All of these

v. A _____ defines a set of standards for components, including interface standards, usage standards, and deployment standards. **1**
(a) Component-based software engineering
(b) Component composition
(c) Component model
(d) Component interfaces

vi. Cohesion is a qualitative indication of the degree to which a module? **1**
(a) Can be written more compactly
(b) Focuses on just one thing
(c) Can complete its function in a timely manner
(d) Is connected to other modules and the outside world

vii. Software testing with real data in real environment is known as- **1**
(a) Alpha testing
(b) Beta testing
(c) Regression testing
(d) None of these

viii. White-box testing is done by- **1**
(a) Software architect
(b) Software developers
(c) Users
(d) All of these

ix. Which of the following is NOT a step in the risk management process? **1**
(a) Risk identification
(b) Risk analysis
(c) Risk elimination
(d) Risk monitoring and control

x. Which estimation technique relies on the analogy of past projects to estimate the effort required for the current project? **1**
(a) Function point based metrics
(b) COCOMO models
(c) Project scheduling
(d) Effort distribution

Q.2 i. Define software engineering and briefly explain its significance in modern software development. **2**

ii. Discuss the evolution of software engineering highlighting major milestones and paradigm shifts. **3**

iii. Compare and contrast the waterfall and incremental process models, highlighting their advantages and disadvantages. **5**

OR iv. Explain the Rational Unified Process (RUP) and its various phases. Discuss how RUP differs from traditional waterfall models in software development. **5**

Q.3 i. Explain the importance of requirement analysis in the software development life cycle. Discuss three techniques used in requirement elicitation. **3**

ii. Discuss the differences between structural and behavioral models in software engineering. Provide examples of each type of model and explain their significance in understanding system requirements and behavior. **7**

OR iii. Explain the various types of relationships in class based modelling. Provide examples for each type and discuss their implications in software design and development. **7**

Q.4 i. Explain the concept of configuration management in software engineering. Discuss its importance in ensuring the integrity and traceability of software artifacts throughout the development lifecycle. **4**

ii. Describe the state machine view and its significance in software design. Provide examples of real-world systems where the state machine view can be effectively applied. **6**

OR iii. Compare and contrast the sequence diagram and collaboration diagram as two types of interaction diagrams in UML. Illustrate with examples how each diagram represents the dynamic behavior of a system. **6**

Q.5 i. Discuss the significance of software testing in ensuring the quality and reliability of software systems. Explain how testing activities contribute to the verification and validation process. **4**

ii. Explain the concept of software patterns and discuss different types of patterns commonly used in software design. Provide examples of each type of pattern and explain their application in real-world scenarios. **6**

Marking Scheme

SOFTWARE ENGINEERING (SE) IT3CO36

Q.1	i)	Which is the most important feature of spiral model? b) Risk management	**1**
	ii)	Which of these software engineering activities are not a part of software processes? c) Software validation	**1**
	iii)	Which diagrams are used to illustrate the interactions between objects visually. a) UML Collaboration	**1**
	iv)	What is a Functional Requirement? a) Specifies the tasks the program must complete	**1**
	v)	A _____ defines a set of standards for components, including interface standards, usage standards, and deployment standards. c) Component model	**1**
	vi)	Cohesion is a qualitative indication of the degree to which a module b) Focuses on just one thing	**1**
	vii)	Software Testing with real data in real environment is known as b) beta testing	**1**
	viii)	White-Box Testing is done by b) Software Developers	**1**
	ix)	Which of the following is NOT a step in the risk management process? c) Risk Elimination	**1**
	x)	Which estimation technique relies on the analogy of past projects to estimate the effort required for the current project? b) COCOMO Models	**1**
Q.2	i.	Define Software Engineering (1 Mark) Significance in modern software development. (1 Mark)	**2**
	ii.	Evolution of software engineering highlighting major milestones and paradigm shifts. (1 Mark each)	**3**
	iii.	Waterfall and Incremental process models (1.5 Mark each) highlighting their advantages and disadvantages. (0.5 Mark each)	**5**
OR	iv.	Explain the Rational Unified Process (RUP) and its various phases. (3 Marks) Discuss how RUP differs from traditional waterfall models in software development. (2 Marks)	**5**
Q.3	i.	Explain the importance of requirement analysis in the software development life cycle. (2 Marks) Discuss three techniques used in requirement elicitation. (1 Marks)	**3**
	ii.	Discuss the differences between structural and behavioral models in software engineering. (4 Marks) Provide examples of each type of model and explain their (3 Mark)	**7**
OR	iii.	Explain the various types of relationships in Class Based Modelling. (4 Mark) Provide examples for each type and discuss their implications in software design and development. (3 Mark)	**7**
Q.4	i.	Explain the concept of Configuration Management in software engineering. (2 Mark) Discuss its importance in ensuring the integrity and traceability of software artifacts throughout the development lifecycle. (2 Mark)	**4**
	ii.	Describe the State Machine View and its significance in software design. (4 Mark) Provide examples of real-world systems where the State Machine View can be effectively applied. (2 Mark)	**6**
OR	iii.	Compare and contrast the Sequence Diagram and Collaboration Diagram as two types of Interaction Diagrams in UML. (4 Mark) Illustrate with examples how each diagram represents the dynamic behavior of a system. (2 Mark)	**6**
Q.5	i.	Discuss the significance of software testing in ensuring the quality and reliability of software systems. (2 Mark) Explain how testing activities contribute to the verification and validation process. (2 Mark)	**4**
	ii.	Explain the concept of software patterns and discuss different types of patterns commonly used in software design. (4 Mark) Provide examples of each type of pattern and explain their application in real-world scenarios. (2 Mark)	**6**
OR	iii.	Describe the Object-Oriented Testing approach and its key principles. (3 Mark) Challenges associated with testing object-oriented systems and how these challenges can be addressed effectively. (3 Mark)	**6**
Q.6	i.	Explain the COCOMO Model and its different variants. (3 Mark) Discuss how COCOMO models can be used for software project estimation and resource allocation. (2 Mark)	**5**
	ii.	Discuss the process of Risk Assessment in software projects.	**5**

	(2 Mark) Identify and explain various techniques used for identifying, analyzing, and prioritizing risks in software development.(3 Mark)	
iii.	Explain the concept of Software Metrics and its importance in software engineering. (2 Mark) Discuss different types of metrics and how they can be used to measure and improve the quality and productivity of software development projects. (3 Mark)	**5**

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