

SOFTWARE ENGINEERING
(MCA1103)

Time Allotted : 2½ hrs

Full Marks : 60

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 4 (four) from Group B to E, taking one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A

1. Answer any twelve:

12 × 1 = 12

Choose the correct alternative for the following

- (i) Which principle is central to software engineering ethics?
 - (a) Maximizing profit
 - (b) Public interest
 - (c) Coding speed
 - (d) Company loyalty
- (ii) Coping with change in software processes primarily requires:
 - (a) Fixed requirements
 - (b) Flexibility in process and design
 - (c) Ignoring feedback
 - (d) Skipping tests
- (iii) An unexpected shutdown due to software bug is an example of:
 - (a) System fault
 - (b) User error
 - (c) Marketing issue
 - (d) Hardware failure
- (iv) What is the first step in requirements engineering process?
 - (a) Validation
 - (b) Elicitation
 - (c) Specification
 - (d) Management
- (v) Function Point analysis measures software size based on:
 - (a) Number of lines of code
 - (b) Functionality provided to the user
 - (c) Hardware specs
 - (d) Testing effort
- (vi) Architectural views represent:
 - (a) Only user interfaces
 - (b) Different perspectives such as logical, process, development, and physical structures
 - (c) Database schema only
 - (d) Hardware configurations
- (vii) Verification in software testing ensures that:
 - (a) The software meets user expectations
 - (b) The software fulfills its requirements specification
 - (c) The software runs without failure
 - (d) The software passes all test cases

- (viii) Alpha testing is usually performed by:
 - (a) Customers
 - (b) Developers within the organization
 - (c) Third-party testing teams
 - (d) End-users at client site
- (ix) UML class diagrams primarily represent:
 - (a) Functions and processes
 - (b) Object-oriented system structure through classes and relationships
 - (c) Sequence of events over time
 - (d) Database relations only
- (x) Agile software development emphasizes:
 - (a) Rigid documentation
 - (b) Customer collaboration and adaptability to change
 - (c) Strict phase-based cycles
 - (d) Detailed upfront planning

Fill in the blanks with the correct word

- (xi) The software engineering _____ includes phases such as requirements, design, implementation, testing, and maintenance.
- (xii) _____ is the process of evaluating software to ensure it meets specifications.
- (xiii) Software _____ measures the readiness of a system for correct service.
- (xiv) Extreme programming (XP) is an example of an _____ method that focuses on frequent releases and customer involvement.
- (xv) _____ in software projects involves identification, analysis, and mitigation of risks.

Group - B

- 2. (a) If you have to develop a pay roll software product, what process model will you choose? Justify your answer and examine. *[[CO2) (Analyse/10CQ]]*
- (b) Examine the management's myth in software engineering, discussing its implications on project management and outcomes. *[[CO1) (Remember/LOCQ]]*
8 + 4 = 12
- 3. (a) Software engineering is a layered approach – Explain with neat diagram. *[[CO1)(Understand/LOCQ]]*
- (b) Explain Spiral model with a neat sketch. What can you say about the software that is being developed or maintained as you move outward along the spiral process flow? *[[CO3)(Remember/LOCQ]]*
6 + 6 = 12

Group - C

- 4. (a) Develop the spiral view of requirement engineering process. *[[CO3) (Remember/LOCQ]]*

- (b) Elaborate the phases involved when carrying out a feasibility study. [[CO3](Remember/LOCQ)]
6 + 6 = 12
5. (a) What are the key components of a class diagram? Explain the significance of associations, multiplicity, and inheritance in modelling system structure. [[CO4](Remember/LOCQ)]
- (b) Develop an online railway reservation system, which allows the user to select route, book/cancel tickets using net banking/credit/debit cards. The site also maintains the history of the passengers. For the above system, list and draw the use case scenario and model the above specification. [[CO4](Analyse/IOCQ)]
6 + 6 = 12

Group - D

6. (a) What is architectural design, and why is it important in software development? [[CO3](Remember/LOCQ)]
- (b) Discuss how architectural design decisions influence the success of a software project, providing suitable examples. [[CO3](Understand/LOCQ)]
3 + (6 + 3) = 12
7. (a) Explain the idea of design patterns and provide an example. [[CO3](Analyse/IOCQ)]
- (b) Explain the main elements of the MVC (Model-View-Controller) architecture and analyse its relevance in contemporary web application development. [[CO4](Remember/LOCQ)]
4 + 8 = 12

Group - E

8. (a) Define and explain the terms *Error*, *Fault*, *Bug*, and *Failure* in the context of software testing. [[CO4](Understand/LOCQ)]
- (b) Examine the similarities and differences between White-box and Black-box Testing, emphasizing their respective benefits and limitations in different testing scenarios. [[CO4](Analyse/IOCQ)]
6 + 6 = 12
9. (a) What are the primary objectives of Software Configuration Management (SCM)? [[CO5](Understand/LOCQ)]
- (b) Compare and contrast Software Reuse and Software Re-engineering. What are the potential benefits and challenges of each? [[CO5](Analyse/IOCQ)]
4 + 8 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	66.67	33.33	0

