

**SOFTWARE ENGINEERING
(MCAP 3101)**

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

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

**Group - A
(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**

- (i) Which of the following is not one of the principles of agile software development method?
(a) Following the plan (b) Embrace change
(c) Customer involvement (d) Incremental delivery
- (ii) What is the major drawback of using RAD Model?
(a) Increases reusability of components, Highly specialized & skilled developers/designers are required
(b) Encourages customer/client feedback
(c) Increases reusability of components
(d) Highly specialized & skilled developers/designers are required

(iii) Match List I to List II

List I	List II
(a) Software Model	i. Ebusiness that starts with only the basic functionality and then moves on to more advanced feature.
(b) Incremental Development	ii. An inventory control system for a super market to be developed in a highway.
(c) Prototyping	iii. A virtual reality system for simulating vehicle navigation in a highway.
(d) RAD	iv. Automate the manual system for student record maintenance in a school.

Continued..

- (a) - (ii), (b) - (iv), (c) - (i), (d) - (iii)
(b) - (i), (b) - (iii), (c) - (iv), (d) - (ii)
(c) - (iii), (b) - (ii), (c) - (iv), (d) - (i)
(d) - (iv), (b) - (i), (c) - (iii), (d) - (ii)

- (iv) The software_ of a program or a computing system is the structure or structures of the system, which comprise software components, the externally visible properties of those components, and the relationships among them.
 (a) Design (b) Architecture (c) Process (d) Requirement
- (v) Which one of the following is a functional requirement
 (a) Robustness (b) Portability (c) Maintainability (d) None
- (vi) Match the following in Software Engineering :

List 1	List 2
A. Product Complexity	i. Software requirements definition
B. Structured System Analysis	ii. Software Design
C. Coupling and Cohesion	iii. Validation Technique
D. Symbolic Execution	iv. Software Cost Estimation

- (a) (A)-(ii), (B)-(iii), (C)-(iv), (D)-(i)
 (b) (A)-(iii), (B)- (i), (C)-(iv), (D)-(ii)
 (c) (A)-(iii), (B)- (i), (C)-(iv), (D)-(ii)
 (d) (A)-(iii), (B)- (iv), (C)-(i), (D)-(ii)
- (vii) Which design metric is used to measure the compactness of the program in terms of lines of code?
 (a) Consistency (b) Conciseness (c) Efficiency (d) Accuracy
- (viii) In UML diagram of a class
 (a) State of object cannot be represented
 (b) State is irrelevant
 (c) State is represented as an attribute
 (d) State is represented as a result of an operation
- (ix) Following is used to demonstrate that the new release of software still performs the old one did by rerunning the old tests
 (a) Functional testing (b) Path testing
 (c) Stress testing (d) Regression testing
- (x) In software testing, how the error, fault and failure are related to each other?
 (a) Fault leads to error and error leads to failure
 (b) Error leads to fault and fault leads to failure.
 (c) Fault leads to failure but error is not related to fault and failure.
 (d) Error leads to failure but fault is not related to error and failure.

Group – B

2. (a) If you have to develop a word processing software product, what process model will you choose? Justify your answer and examine. [(CO3) (Analyze/IOCQ)]
- (b) Discuss unique characteristics of software which differentiates it from other product. [(CO1) (Analyze/IOCQ)]

6 + 6 =12

3. (a) Is it possible to realize spiral model for software. [(CO2) (Analyze /IOCQ)]
(b) Explain at least one scenario "Waterfall model is preferable compare to all other models." [(CO2) (Evaluate/HOCQ)]
- 6 + 6 = 12**

Group - C

4. (a) Explain the concept, purpose and benefits of Quality Function Deployment (QFD). Use a simple example to illustrate the technique. [(CO2) (Apply/IOCQ)]
(b) Compare and contrast the terms inception, elicitation and elaboration with reference to requirements. [(CO2) (Analyze/IOCQ)]
- 6 + 6 = 12**
5. (a) Explain Function Point calculation process with sample values, step-by-step. Explain the meaning of the number "Function Point". [(CO5) (Evaluate/HOCQ)]
(b) What is use case modelling? Explain. [(CO3) (Understand/LOCQ)]
- 8 + 4 = 12**

Group - D

6. (a) Using the number system of complex numbers, real numbers, rational numbers, integers, and natural numbers, illustrate the concept of "part-of" hierarchy and "is-a" hierarchy. [(CO3) (Apply/IOCQ)]
(b) Draw the activity diagram for online shopping cart. [(CO3) (Apply/IOCQ)]
- 6 + 6 = 12**
7. What is the working principle of Agile? What value is provided by Agile? Discuss.
[(CO2) (Remember/LOCQ)]
- 12**

Group - E

8. (a) What is flow graph notation and show how it is important in white box testing?
[(CO4) (Apply/IOCQ)]
(b) Integration testing can be tracked top-down or bottom-up. Explain each of these strategies. [(CO4) (Analyze/IOCQ)]
- 6 + 6 = 12**
9. (a) Explain role of Equivalence partitioning in test case generation.
[(CO4) (Evaluate/HOCQ)]
(b) Explain the quality factors of McCall. [(CO4) (Understand/LOCQ)]
- 8 + 4 = 12**

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	20%	60%	20%

Course Outcome (CO):

After the completion of the course students will be able to

- C01: Exemplify the software engineering process, systems and security
- C02: Explain software engineering process by identifying the requirements and system modeling
- C03: Design, develop and implement software based on requirement.
- C04: Illustrate the evolution process, reuse and testing for developing a quality software for customer.
- C05: Describe the software management, project management, and planning and configuration management

*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question;
HOCQ: Higher Order Cognitive Question

Department & Section	Submission Link
MCA	https://classroom.google.com/c/NDA1MzQ2NDQ2NTkw/a/NDU3NDM3NzU4NjA5/details