

**SOFTWARE ENGINEERING
(MCAP 2201)**

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 these software engineering activities are not a part of software processes?
 - (a) Software dependence
 - (b) Software development
 - (c) Software validation
 - (d) Software specification
 - (ii) Which one of the following is not a step of requirement engineering?
 - (a) Elicitation
 - (b) Design
 - (c) Analysis
 - (d) Documentation
 - (iii) The most important feature of spiral model is
 - (a) Requirement analysis
 - (b) Risk management
 - (c) Quality management
 - (d) Configuration management
 - (iv) Agile Modelling (AM) provides guidance to practitioner during which of these software tasks?
 - (a) Analysis
 - (b) Design
 - (c) Coding
 - (d) both a and b
 - (v) Which of the following is true?
 - (a) Prototyping is a method of requirement validation
 - (b) Consistency and completeness of functional requirements are always achieved in practice.
 - (c) Requirements review is carried out to find errors in system design.
 - (d) Requirements document also describe how requirements that are listed in documents are implemented efficiently.
 - (vi) “Consider a system where a heat sensor detects an intrusion and alerts the security company.” What kind of a requirement the system is providing?
 - (a) Functional
 - (b) Non-functional
 - (c) Known requirement
 - (d) None of the mentioned

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- (vii) Data Flow Diagrams are used for
(a) Process modelling
(b) Modelling interactions in a real time environment
(c) Data modelling
(d) None of mentioned
- (viii) Black box testing can be applied to
(a) UML diagram (b) Data flow diagram
(c) Entity relationship diagram (d) Flow charts
- (ix) Modifying the software to match changes in the ever-changing environment is called
(a) Adaptive maintenance (b) Corrective maintenance
(c) Perfective maintenance (d) Preventive maintenance
- (x) Software measurement is useful to
(a) indicate quality of the product
(b) track progress
(c) form a baseline for estimation and prediction
(d) all of mentioned.

Group – B

2. (a) Explain software engineering and software engineering layers.
(b) Explain unified process? Elaborate on the unified process work products.
6 + 6 = 12
3. (a) Classify the metrics for specifying non-functional requirements.
(b) Describe the characteristics of good SRS document and their components
4 + 8 = 12

Group – C

4. (a) Compute and prepare function point value for a project with the following information domain characteristics.
No. of external inputs-30
No. of external outputs - 52
No. of external inquiries-22
No. of logical files-12
No. of external interface files-2
Assume complexity adjustment values for the above are average (4, 5, and 4,10,7 respectively). The system requires significant reliability(4), is moderate performance critical(2), system requires moderate online data entry(2) and all other factors are incidental.
- (b) Explain in detail about the COCOMO II model for software estimation.
6 + 6 = 12

5. (a) Explain briefly the following:
(i) Coupling between the modules
(ii) The internal Cohesion of a module
- (b) Define:
(i) Abstraction
(ii) Modularity
(iii) Functional independence.

$$(3 + 3) + (2 + 2 + 2) = 12$$

Group – D

6. (a) Explain importance of data dictionary with example.
- (b) If the customer buys \$500 or more worth of merchandise, delivery is free. If the customer buys between \$100 and \$500 worth of merchandise, then the delivery charge is \$10, unless s/he is a valued customer. In this case, the delivery charge is \$5 unless if the customer pays by cash in which case the delivery is free. If the customer buys under \$100 worth of goods, the delivery charge is \$10, unless the customer pays cash, in which case the delivery charge is \$5
- i. Design the complete decision table for this process.
ii. Draw this table as an Extended Entry table.

$$4 + 8 = 12$$

7. (a) Explain sequence and activity diagram with example.
- (b) Consider the following shopping portal:
A customer visits the online shopping portal. A customer may buy item or just visit the page and logout. The customer can select a segment, then a category and brand to get different products in the desired brand.
The customer can select product for purchasing. The process can be repeated for more items. Once the customer finishes selecting product/s the cart can be viewed. The cart can be edited. For the final payment the customer has to login. If the customer is first time user he must register with portal. Finally cart is submitted for payment and card details, addresses are to be confirmed by customer. Customer gets a confirmation with shipment Id and delivery of goods within 7 days. Draw a use case diagram for the above case study.

$$6 + 6 = 12$$

Group – E

8. (a) Explain the following i. integration testing ii. unit testing.
- (b) A program reads the lengths of the sides of a triangle. The program prints a message that states whether the triangle is scalene, isosceles or equilateral. Develop a set of test cases that will adequately test the program.

$$(2 + 2) + 8 = 12$$

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9. (a) Explain software verification and validation.
- (b) What is cyclomatic complexity? Explain with the help of suitable example.
- 6 + 6 = 12**

Department & Section	Submission Link
MCA	https://classroom.google.com/c/MzcxNzUxOTE1ODkx/a/MzcxNzU2MDk2MTE4/details