

SOFTWARE ENGINEERING
(INFO 2201)

Time Allotted : 2½ hrs

Full Marks : 60

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any4 (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 of the following is not defined in a good Software Requirement Specification (SRS) document?
 - (a) Functional Requirement
 - (b) Non-functional Requirement
 - (c) Goals of implementation
 - (d) Algorithm for software implementation.
- (ii) What is the simplest model of software development paradigm?
 - (a) Spiral model
 - (b) Big Bang model
 - (c) V-model
 - (d) Waterfall model.
- (iii) Which defect amplification model is used to illustrate the generation and detection of errors during the preliminary steps of a software engineering process?
 - (a) Design
 - (b) Detailed design
 - (c) Coding
 - (d) All mentioned above.
- (iv) Which is not a step of Requirement Engineering?
 - (a) Requirements elicitation
 - (b) Requirements analysis
 - (c) Requirements design
 - (d) Requirements documentation
- (v) Give the disadvantages of modularization.
 - (a) Smaller components are easier to maintain
 - (b) Program can be divided based on functional aspects
 - (c) Desired level of abstraction can be brought in the program
 - (d) None of the above.
- (vi) Cohesion metrics and coupling metrics are metrics in which level of design?
 - (a) User interface design
 - (b) Pattern-based design
 - (c) Architectural design
 - (d) Component-level design.
- (vii) Line of code (LOC) of the product comes under which type of measures?
 - (a) Indirect measures
 - (b) Direct measures
 - (c) Coding
 - (d) None of the above.

- (viii) Give the name to diagram that represents the flow of activities described by the use cases and at the same time the captors are involved in UML.
 (a) State diagram (b) Swim lane diagram
 (c) Activity diagram (d) Component diagram
- (ix) When can white-box testing be started?
 (a) After SRS creation (b) After installation
 (c) After programming (d) After designing.
- (x) In which environment we can performed the Alpha testing?
 (a) User's end (b) Developer's end
 (c) User's and developer's end (d) None of the above.

Fill in the blanks with the correct word

- (xi) RAD Software process model stands for ____.
- (xii) Modifying the software to match changes in the ever changing environment is called ____.
- (xiii) The level at which the software uses scarce resources is ____.
- (xiv) When elements of module are grouped together that are executed sequentially inorder to perform a task, is called ____.
- (xv) One of the fault base testing techniques is ____.

Group - B

2. (a) Describe the characteristics of good SRS. [[CO1](Remember/LOCQ)]
 (b) With a suitable diagram explain the elements of the agile model. [[CO1](Analyse/IOCQ)]
 (c) Create a data dictionary that provides with a precise definition of telephone number, it should indicate where and how this data item is used and supplementary information that is relevant to it? [[CO2](Apply/IOCQ)]
4 + 4 + 4 = 12
3. (a) What are the necessities of Life cycle model? Elaborate on the various issues of Software life cycle. [[CO1](Apply/IOCQ)]
 (b) Create a decision table for testing the traffic light system. Table shows the inputs like the working state of every traffic light in the area, signs at the traffic light, and the presence of traffic police. Further, the actions tell whether the traffic lights, priority signs, or the traffic police regulate the traffic. [[CO2](Analyse/IOCQ)]
6 + 6 = 12

Group - C

4. (a) Compare Activity and State Chart diagram. Mention the elements of an Activity Diagram. [[CO3](Analyse/IOCQ)]

- (b) Draw the use case diagram for online shopping system to search for and purchase products. [[CO3](Analyse/IOCQ)]
6 + 6 = 12
5. (a) Demonstrate how to buy a book online using sequence diagram. [[CO3](Analyse/IOCQ)]
- (b) What are the different types of UML diagrams for different views of system? [[CO3](Remember/LOCQ)]
6 + 6 = 12

Group - D

6. (a) Explain with example the term “linearly independent paths”? How is path testing carried out by using McCabe’s cyclomatic complexity metric? Is it possible to achieve 100% path coverage in path coverage based testing? [[CO4](Understand/LOCQ)]
- (b) Distinguish between the following terms:
(i) verification and validation
(ii) alpha testing and beta testing. [[CO4](Analyse/IOCQ)]
(2 + 3 + 1) + (3 + 3) = 12
7. (a) What kind of tests are needed in the maintenance phase of an installed software? Describe the importance of stress testing with example. [[CO4](Analyse/IOCQ)]
- (b) Discuss with example a fault-based testing method. [[CO4](Remember/LOCQ)]
(2 + 4) + 6 = 12

Group - E

8. (a) Calculate the function point, productivity, documentation, and cost per function for software application with multiple Processing Factors 5, 1, 0, 4, 3, 5, 4, 3, 4, 5, 2, 3, 4, 2 by using following given Data: The number of EI(Avg): 22, The number of EO(Low): 45, The number of EI(High): 06, The number of ILF(Avg): 05, The number of ELF(Low): 02, Effort: 37 MM, Software technical documents: 250 pages, User related documents: 120 pages and Budgeting/Cost: \$7520 per month. [[CO5](Evaluate/HOCQ)]
- (b) Explain the different type of maintenance process. [[CO6](Remember/LOCQ)]
8 + 4 = 12
9. (a) A software project with an estimated effort of 150 Person-Months is using the Intermediate COCOMO model. If the scale factor is 1.15 and the exponent (b) is 1.20, calculate the lines of code (LOC) for this project. [[CO5](Apply/IOCQ)]
- (b) Write the short note of the following:
(i) Gantt Chart and
(ii) PERT Chart. [[CO6](Remember/LOCQ)]
6 + 6 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	33.33	58.33	8.33

Course Outcome (CO):

After the completion of the course students will be able to

INF02201.1. Understand the basic concept of SDLC stages and different SDLC models.

INF02201.2. Model function-oriented software design.

INF02201.3. Develop object-oriented software design.

INF02201.4. Analyze different approaches of testing methodology in software system.

INF02201.5. Estimate size, effort, cost and time related to a software project.

INF02201.6. Work out software project schedule and staffing plan.

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