



COMSATS University Islamabad (CUI)

Department of Computer Science
terminal Examination spring - 2025
BS (CS/AI/DS/SE/CT)

Course: CSC291-Software Engineering Concept

Dated: 30-06-2025

Instructor: Hafiza Sundus BSE-3, Maheen Gul BDS-6

Maximum Marks: 50

Time Allowed: 180 Minutes

Note: All questions are self-explanatory and require no further explanations during exam time.

- Return the question paper along with the answer sheet. Attempt all questions on answer sheet.

CLO-1: Explain the concept of software engineering along with its processes and deliverables

Q.# 1.

- 1.1 Define the concept of Agility. In which scenarios is the Agile model most effectively utilized? Furthermore, identify and discuss the typical challenges associated with implementing the Agile model.
- 1.2 Provide a comprehensive overview of the Scrum Approach, outlining its key phases in the software development process. Additionally, explain the Sprint cycle and its significance within Scrum development. [3+3 Marks]

CLO-2: Identify functional and non-functional requirements for a medium size software system

- Q.# 2. Derive at least 4 system requirements from the following user requirement. [4 Marks]
- The MHC-PMS shall generate monthly management reports showing the cost of drugs prescribed by each clinic during that month.

Q.# 3. The software requirement document for the tender for development of "Super-lab," a software system for managing a hospital laboratory, consists of chapters according to the required quality factors as follows: correctness, reliability, efficiency, integrity, usability, maintainability, flexibility, testability, portability, reusability and interoperability. In the following table you will find sections taken from the mentioned requirements document. For each section, select the factor that best fits the requirement (choose only one factor per requirements section). [5 Marks]

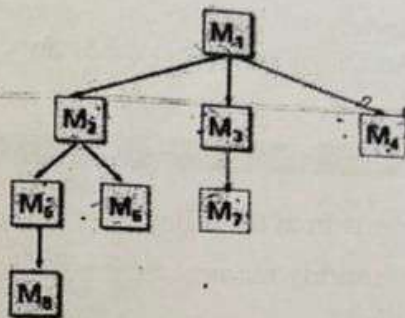
No.	Section taken from the software requirement document
1	The probability that the "Super-lab" software system will be found in a state of failure during peak hours (9 am to 4 pm) is required to be below 0.5%. Reliability
2	The training of a laboratory technician, requiring no more than 3 days, will enable the technician to reach level C of "Super-lab" software usage. This means that he or she will be able to manage reception of 20 patients per hour. INTEROPERABILITY
3	The "Super-lab" subsystem that deals with billing patients for their tests may be eventually used as a subsystem developed in the "Physiotherapy Center" software package. Flexibility
4	The "Super-lab" software package developed for the Linux operating system should be compatible for applications in a Windows NT environment. Portability
5	The "Super-lab" software system will record a detailed users' log. In addition, the system will report attempts by unauthorized persons to obtain medical information from the laboratory test results database. Integrity

[CLO-4: Construct appropriate design models for the structure and behavior of medium-size software system]

Q.# 4. A company is developing a Food Delivery System that allows customers to browse restaurants, view menus, place orders, and track delivery. A customer can place an order containing one or more menu items from a restaurant. Each order is assigned to one delivery person, who can handle only one active delivery at a time. The system calculates delivery charges based on distance. The restaurant updates the order status as it is prepared, and the delivery person updates the status during delivery (e.g., Out for delivery, Delivered). An admin manages restaurants, menu items, and delivery personnel. Draw a class diagram showing the key classes, attributes, operations, relationships, multiplicities, and any inheritance or constraints relevant to this system. Then, draw a sequence diagram for the scenario where a customer places an order, the system assigns a delivery person, the restaurant is notified to prepare the order, and the delivery person updates the status to Out for delivery and delivered. [6+6 Marks]

[CLO-4: Apply software testing and quality assurance techniques to medium-size software system]

Q.# 5. Apply the top-down testing with a Depth-First and with Breadth-First. [4 Marks]

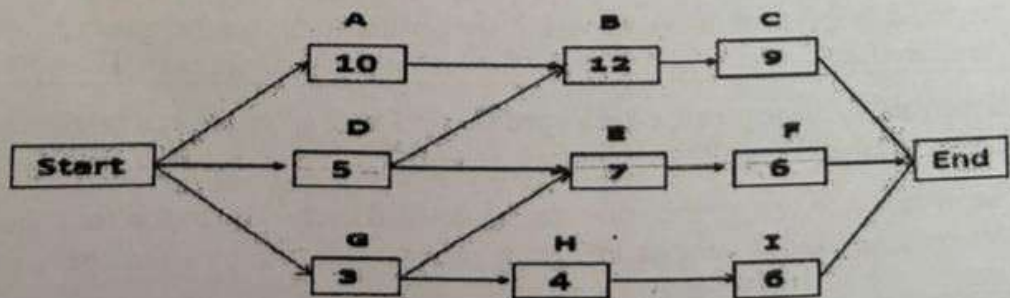


Q.# 6. Compute the function point, productivity, total documentation per function point, and cost per function point for the following data: [8 Marks]

Number of user inputs = 24, Number of user outputs = 46, Number of inquiries = 8, Number of files = 4, Number of external interfaces = 2, Effort = 36.9 p-m, Technical documents = 265 pages, User documents = 122 pages, Cost = \$7744/ month, Various Weight Factors respectively are 4, 4, 6, 10, and 5, Various complexity adjustment factors are: 4, 1, 0, 3, 3, 5, 4, 4, 3, 3, 2, 2, 4, and 5.

[CLO-5: Demonstrate software project management skills and maintenance process]

Q.# 7. Calculate Early Start (ES), Early Finish (EF), Late Start (LS), and Late Finish (LF) and float for each activity. In addition identify the total paths, and critical path. Please note that a single mistake charges you -0.5 marks. [11 Marks]



*****BEST OF LUCK*****