

- (v) "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.
- (vi) Choose the incorrect statement with respect to Non-Functional Requirement (NFR).
 (a) Product-oriented Approach – focuses on system (or software) quality
 (b) Process-oriented Approach – focuses on how NFRs can be used in the design process
 (c) Quantitative Approach – finds measurable scales for the functionality attributes
 (d) Qualitative Approach – Studies various relationships between quality goals.
- (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 mentioned.
- (viii) Which reliability metric sets out the probable number of system failures that are likely to be observed relative to a certain time period?
 (a) POFOD (b) ROCOF
 (c) AVAIL (d) None of the mentioned.
- (ix) Which metrics are derived by normalizing quality and/or productivity measures by considering the size of the software that has been produced?
 (a) Size oriented (b) Function-Oriented
 (c) Object-Oriented (d) Use-case-Oriented.
- (x) Test cases should uncover errors like
 (a) nonexistent loop termination
 (b) comparison of different data types
 (c) incorrect logical operators or precedence
 (d) All of the mentioned.

Group - B

2. (a) Describe "Software myth". Discuss on various types of software myths and the true aspects of these myths.
 (b) Describe with the help of the diagram the concurrent development model.

6 + 6 = 12

3. (a) Compare functional requirements with non-functional requirements.
 (b) Discuss your knowledge of how an ATM is used. Develop a set of use-cases that could serve as a basis for understanding the requirements for an ATM system.

5 + 7 = 12**Group - C**

4. (a) What is COCOMO estimation model and What are basic differences between COCOMO and COCOMO II model?
 (b) Consider a database application project with the following characteristics:
 i. The application has 4 screens with 3 views each and 7 database tables for 3 servers and 4 clients.
 ii. The application may generate 3 reports of 6 sections each from 7 database tables for 2 servers and 3 clients.
 There is 10% reuse of the object points. The developer experience and capability in similar environment is low. The maturity of organization in term of capability is also low. Calculate the effort required for developing the application.

4 + 8 = 12

5. (a) Explain briefly the following:
 (i) Coupling between the modules
 (ii) The internal Cohesion of a module
 (b) Assume that the size of an organic type of project has been estimated to be 30,000 lines of code. Average salary of the software engineers estimated Rs. 12000. per month. Calculate the effort required to develop the project, nominal development time and the cost.

6 + 6 = 12**Group - D**

6. (a) Discuss the fundamental principles of structured design. Write note on transform analysis.
 (b) Consider Library Membership Automation Software (LMS) where it should support the following three options: New Member, Renewal, and Cancel Membership. Design Decision tree and Decision table for the above problem.

6 + 6 = 12

7. (a) Explain the term class diagram, generalization, aggregation with example.
- (b) A meeting scheduler system is meant to manage group meetings to be conducted in a company. Develop the use case diagram for this system. Specify and briefly describe any two important use-cases. For each of these two use cases, construct a neat, complete sequence diagram (in UML notation) showing a successful interaction scenario. You should state clearly any reasonable assumption you make about the system.

6 + 6 = 12

Group - E

8. (a) Differentiate between alpha testing and beta testing
- (b) Consider a program for determining the previous date. Its input is a triple of day, month, year with the values in range $1 \leq \text{month} \leq 12$, $1 \leq \text{day} \leq 31$, $1990 \leq \text{year} \leq 2017$. The possible outputs would be previous date or invalid input date. Design the boundary value test cases.

5 + 7 = 12

9. (a) Explain Capability Maturity Model and its levels.
- (b) Draw the CFG for the function named maximum_no. From the CFG determine its cyclomatic complexity.

```

{
    int max;
    if (i>j) then
        if (i>k) then max = i;
        else max=k;
    else if (j>k) max = j;
    else max = k;
    return(max);
}

```

5 + 7 = 12

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 the following is not necessary to apply agility to a software process?
 (a) Eliminate the use of project planning and testing
 (b) Only essential work products are produced
 (c) Process allows team to streamline tasks
 (d) Uses incremental product delivery strategy.
- (ii) What are the three framework activities for the Adaptive Software Development (ASD) process model?
 (a) analysis, design, coding
 (b) feasibility study, functional model iteration, implementation
 (c) requirements gathering, adaptive cycle planning, iterative development
 (d) speculation, collaboration, learning
- (iii) Model preferred to create client/server applications is
 (a) WINWIN Spiral Model
 (b) Spiral Model
 (c) Concurrent Model
 (d) Incremental Model.
- (iv) FAST stands for
 (a) Functional Application Specification Technique
 (b) Fast Application Specification Technique
 (c) Facilitated Application Specification Technique
 (d) None of the mentioned