M.Sc. (Computer Science)
Semester-2
MSCS-2-04T: Software Engineering

Total Marks: 100
External Marks: 70
Internal Marks: 30
Credits: 4
Pass Percentage: 40%

INSTRUCTIONS FOR THE PAPER SETTER/EXAMINER

1. The syllabus prescribed should be strictly adhered to.
2. The question paper will consist of three sections: A, B, and C. Sections A and B will have four questions from the respective sections of the syllabus and will carry 10 marks each. The candidates will attempt two questions from each section.
3. Section C will have fifteen short answer questions covering the entire syllabus. Each question will carry 3 marks. Candidates will attempt any ten questions from this section.
4. The examiner shall give a clear instruction to the candidates to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.
5. The duration of each paper will be three hours.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt any two questions each from the sections A and B of the question paper and any ten short q questions from Section C. They have to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.

Course: Software Engineering	
Course Code: MSCS-2-04T	
Course Outcomes (COs) After the completion of this course, the students will be able to:	
CO1	Understand the software development life cycle which increases the growth opportunity.
CO2	Learn the detail knowledge of software requirement analysis.
CO3	Understands the detailed knowledge of software design and coding.
CO4	Understand the software testing that is relevant to the industry.
CO5	Acquire the detail knowledge of the fundamentals, including terminology; the nature and need for maintenance; maintenance costs and software evolution

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SECTION-A

Unit I: Introduction of Software Engineering: The Problem Domain, Software Engineering, Challenges, Software Engineering Approach. Software development life cycle and its phases, Software development process models: Waterfall, Prototyping, Iterative.

Unit II: Software Process: Characteristics of software process, Project management process, Software configuration management process.

Unit III: Project Planning: Activities, COCOMO model. Software Metrics – Definition, Importance, Categories of metrics. Software Quality – Attributes, Cyclomatic complexity metric.

Unit IV: Software Requirements Analysis: Need for SRS, Data flow diagrams, Data Dictionary, entity relationship diagram, Characteristics and components of SRS, validation, metrics.

SECTION-B

Unit V: Software Design: Design principles, Module-level concepts, Structure Chart and Structured Design methodology, verification, metrics: network metrics, information flow metrics.

Unit VI: Coding: Programming Principles and Guidelines, Verification- code inspections, static analysis.

Unit VII: Software Testing: Testing fundamentals, Black Box Testing: Equivalence class partitioning, Boundary value analysis, cause-effect graphing; White Box Testing: Control flow and Data flow based testing, mutation testing; levels of testing, test plan, test case specification, test case execution and analysis.

Unit VIII: Software Maintenance: Categories of maintenance. Software Reliability – Definition, uses of reliability studies

Reference Books:

- Pankaj Jalote, "An Integrated approach to Software Engineering", 3rd Edition 2005, Narosa Publications.
- K.K. Aggarwal, Yogesh Singh, "Software Engineering", Revised 2nd Edition, New Age International Publishers.
- Roger. S. Pressman, "Software Engineering – A Practitioner's Approach", 5th Edition, Tata McGraw Hill.

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