CS403 SOFTWARE ENGINEERING (RGPV)

UNIT–5 : SOFTWARE MAINTENANCE & PROJECT MANAGEMENT □ □ □ □ □

□ ***Exam Focus:*** *Unit-5 se Maintenance, SCM, Reengineering, Reverse Engineering, Project Management, Risk Management aur SQA par direct questions aate hain.*

Agar tumhara exam kal hai, to Unit-5 ke ye 6 topics pakka kar lo:

□ *Types of Maintenance*

□ *SCM*

□ *Reengineering vs Reverse Engineering*

□ *Project Management*

□ *Risk Management*

□ *SQA*

UNIT OVERVIEW

Why This Unit Is Important?

Software banne ke baad bhi usme changes aur updates karne padte hain.

Project ko time, cost aur quality ke andar complete karna bhi zaruri hota hai.

Ye sab Unit-5 me cover hota hai.

Weightage

□ Approx 15–20 Marks

Most Repeated Questions

□ Types of Software Maintenance

□ SCM (Software Configuration Management)

□ Reengineering vs Reverse Engineering

□ Project Management

□ Risk Management

□ SQA

□ Cost Estimation

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1. SOFTWARE MAINTENANCE □ □ □ □ □

Most Important

Definition

"Software maintenance is the process of modifying software after delivery to correct faults, improve performance, or adapt to changing environments."

Simple Explanation

Software deliver hone ke baad jo changes kiye jate hain unhe maintenance kehte hain.

Example

WhatsApp me new features add hona.

Bug fixes.

Security updates.

Need for Maintenance

 Remove bugs

 Improve performance

 Add new features

 Adapt to new environment

TYPES OF SOFTWARE MAINTENANCE

Most Repeated

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1. Corrective Maintenance

Bug fix karna.

Example

Login error remove karna.

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2. Adaptive Maintenance

Environment change ke according software modify karna.

Example

Windows 10 se Windows 11 support.

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3. Perfective Maintenance

Performance improve karna.

Example

Application speed increase karna.

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4. Preventive Maintenance

Future problems avoid karna.

Example

Code optimization.

Memory Trick

CAPP

C Corrective

A Adaptive

P Perfective

P Preventive

Diagram

Software Maintenance

Corrective Adaptive Perfective Preventive

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2. SOFTWARE CONFIGURATION MANAGEMENT (SCM)

Very Important

Definition

SCM is the process of managing changes in software products.

Objective

Control software changes.

SCM Activities

Configuration Identification

Version Control

Change Control

Status Reporting

Audit

Advantages

 Better control

 Track changes

 Improve quality

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3. CHANGE MANAGEMENT

Definition

Process of handling software changes systematically.

Steps

Change Request

Impact Analysis

Approval

Implementation

Verification

Example

Customer requests a new payment feature.

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4. VERSION CONTROL

Frequently Asked

Definition

Technique used to manage multiple versions of software.

Example

Git

GitHub

GitLab

Benefits

 Track modifications

 Team collaboration

 Easy rollback

Example

Version 1.0

Version 2.0

Version 3.0

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5. CHANGE CONTROL

Definition

Ensures only approved changes are implemented.

Purpose

Prevent unauthorized modifications.

Advantages

- Better quality
- Better management

6. STATUS REPORTING □ □ □

Definition

Reports current status of software configuration items.

Information Provided

- Version information
- Change history
- Current progress

7. PROGRAM COMPREHENSION □ □ □

Definition

Process of understanding existing software.

Why Needed?

- Maintenance
- Bug fixing
- Reengineering

Techniques

- Documentation Study
- Code Review
- Program Analysis

8. REENGINEERING □ □ □ □ □

Most Important

Definition

Process of improving existing software without changing its functionality.

Objective

Improve quality and maintainability.

Example

Old banking software modernization.

Advantages

 Improved performance

 Reduced maintenance cost

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9. REVERSE ENGINEERING

Most Repeated

Definition

Process of extracting design and specifications from existing software.

Objective

Understand existing system.

Example

Studying old software code to understand design.

REENGINEERING vs REVERSE ENGINEERING

Reengineering	Reverse Engineering
Improves system	Understands system
Changes software	No modification
Forward direction	Backward direction

Improves quality	Recovers design
Maintenance purpose	Analysis purpose

 Expected 7 Marks Question

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10. PROJECT MANAGEMENT

Most Important

Definition

Planning, organizing and controlling software projects.

Objectives

 Complete on time

 Within budget

 Required quality

Functions

Planning

Scheduling

Monitoring

Controlling

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11. FEASIBILITY ANALYSIS

Frequently Asked

Definition

Study to determine whether project is practical and beneficial.

Types

Technical Feasibility

Technology available?

Economic Feasibility

Cost justified?

Operational Feasibility

Users can use it?

Schedule Feasibility

Can it be completed on time?

Memory Trick

TEOS

T □ Technical

E □ Economic

O □ Operational

S □ Schedule

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12. PROJECT PLANNING □ □ □ □

Definition

Determining tasks, resources and schedule before development.

Activities

- Scope Definition
- Resource Planning
- Cost Estimation
- Scheduling

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13. RESOURCE ALLOCATION □ □ □

Definition

Assigning resources to project activities.

Resources

- Human Resources
- Hardware
- Software
- Budget

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14. COST ESTIMATION □ □ □ □ □

Important

Definition

Predicting total project cost.

Factors

- Project Size
- Complexity
- Team Size
- Duration

Methods

Expert Judgment

COCOMO Model

Historical Data

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15. PROJECT SCHEDULING □ □ □ □

Definition

Planning project activities according to timeline.

Tools

Gantt Chart

Task A □ □ □ □ □ □
Task B □ □ □ □
Task C □ □ □

PERT Chart

Shows activity dependencies.

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16. RISK MANAGEMENT □ □ □ □ □

Most Important

Definition

Process of identifying and managing project risks.

Risk Management Process

Risk Identification
□
Risk Analysis
□
Risk Planning
□
Risk Monitoring

Types of Risks

Technical Risk

Technology failure.

Project Risk

Schedule delay.

Business Risk

Financial loss.

Risk Mitigation

Reduce probability and impact.

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17. SOFTWARE QUALITY ASSURANCE (SQA) □ □ □ □ □

Most Repeated

Definition

Activities that ensure software quality.

Objectives

 Defect prevention

 Process improvement

 Quality standards

SQA Activities

Standards

Reviews

Testing

Audits

Quality Improvement

Advantages

- Better software quality
- Reduced defects
- Increased customer satisfaction

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18. PROJECT METRICS

Definition

Measures used to evaluate project performance.

Examples

Cost Metrics

Actual cost

Schedule Metrics

Completion time

Productivity Metrics

LOC per person

Quality Metrics

Number of defects

UNIT–5 IMPORTANT QUESTIONS

2 Marks

1. Define Software Maintenance.
2. What is SCM?
3. What is SQA?
4. Define Risk Management.
5. What is Version Control?

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5 Marks

1. Explain Types of Maintenance.
2. Explain SCM Activities.
3. Explain Feasibility Analysis.
4. Explain Cost Estimation.

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7 Marks

1. Reengineering vs Reverse Engineering.
2. Explain Risk Management Process.
3. Explain SQA.
4. Explain Project Scheduling.

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10 Marks

1. Explain Software Maintenance and its Types.
2. Explain SCM in detail.
3. Explain Project Management Concepts.
4. Explain Risk Management with diagram.
5. Explain SQA and its activities.

PYQ ANALYSIS & 2026 PREDICTION

Topic	Trend	Probability
Types of Maintenance	Frequently Asked	Very High
SCM	Frequently Asked	Very High
Reengineering vs Reverse Engineering	Frequently Asked	Very High
Project Management	Frequently Asked	Very High
Risk Management	Frequently Asked	High
SQA	Frequently Asked	High
Cost Estimation	Sometimes Asked	High
Project Metrics	Sometimes Asked	Medium

LAST NIGHT REVISION SHEET

 CAPP = Corrective, Adaptive, Perfective, Preventive

 SCM = Managing Software Changes

 Git/GitHub = Version Control

 Reengineering = Improve Existing Software

 Reverse Engineering = Understand Existing Software

 TEOS = Technical, Economic, Operational, Schedule Feasibility

 Risk Types = Technical, Project, Business

 SQA = Quality Assurance Activities

 Project Management = Planning + Scheduling + Monitoring + Control