UNITE 1

Q1. Explain the Project Life Cycle with a neat diagram.

Definition

A **Project Life Cycle (PLC)** is the sequence of phases that a project passes through from its beginning to its completion.

Diagram

Initiation

↓

Planning

↓

Execution

↓

Monitoring & Controlling

↓

Closing

Phases

1. Initiation

- Identify project objective.
- Study feasibility.
- Prepare project charter.
- Identify stakeholders.

2. Planning

- Prepare project plan.
- Define scope and schedule.
- Estimate cost and resources.
- Identify risks.

3. Execution

- Perform project work.
- Manage team.
- Procure resources.
- Maintain quality.

4. Monitoring & Controlling

- Compare actual work with plan.
- Track cost and schedule.
- Control risks.
- Take corrective actions.

5. Closing

- Deliver final product.
- Obtain customer approval.
- Close contracts.
- Document lessons learned.

Q2. Explain PMBOK Framework, Process Groups and Knowledge Areas.

PMBOK

PMBOK (Project Management Body of Knowledge) is a globally accepted standard developed by Project Management Institute that provides best practices for project management.

Five Process Groups

1. Initiating
2. Planning
3. Executing
4. Monitoring & Controlling
5. Closing

Ten Knowledge Areas

1. Integration Management
2. Scope Management
3. Schedule Management
4. Cost Management
5. Quality Management
6. Resource Management
7. Communication Management
8. Risk Management
9. Procurement Management
10. Stakeholder Management

Diagram

Initiating

↓

Planning

↓

Executing

↓

Monitoring & Controlling

↓

Closing

CONCLUSION

UNITE 1

Q3. Define Work Breakdown Structure (WBS) and explain its types with examples.

Definition

A **Work Breakdown Structure (WBS)** is a hierarchical decomposition of the total project work into smaller and manageable tasks.

Diagram

Online ShoppingWebsite
|
├── Design
├── Development
├── Testing
└── Deployment

Types

1. Deliverable-Based WBS

- Divides work based on project outputs.
- Example:
- Website
- Mobile App
- User Manual

2. Phase-Based WBS

- Divides work according to project phases.
- Example:
- Planning
- Design
- Development
- Testing
- Maintenance

Advantages

- Easy planning
- Better resource allocation
- Improves cost estimation
- Easier progress tracking
- Reduces project risk

Q4. Differentiate between Traditional and Modern Project Management.

Traditional PM	Modern PM
Sequential approach	Iterative approach
Fixed requirements	Flexible requirements
Less customer involvement	Continuous customer feedback
Changes are difficult	Changes are easily accepted
Suitable for construction	Suitable for software and IT
Long delivery cycle	Short delivery cycle

Q5. Explain Portfolio Management and its advantages.

Definition

Portfolio Management is the centralized management of multiple projects and programs to achieve organizational goals.

Diagram

Portfolio
|
├── Project A
├── Project B
├── Project C

Advantages

-
- Better decision making
- Efficient resource utilization
- Higher return on investment
- Better risk management
- Aligns projects with business goals
- Improves project prioritization

Conclusion

UNITE 1

Q6. Define a Project and explain its characteristics.

Definition

A **Project** is a temporary effort undertaken to create a unique product, service, or result.

Characteristics

- Temporary in nature
- Has a specific objective
- Produces a unique output
- Limited budget
- Defined start and end date
- Uses resources
- Involves risk and uncertainty

Example

Developing an Online Shopping Website.

Q7. Explain the relationship between PMBOK and Project Management.

Relationship

- PMBOK is a guide for project management.
- Project Management is the practical application of PMBOK principles.
- PMBOK provides processes, tools, and best practices.
- Project managers use PMBOK to plan, execute, monitor, and close projects.
- PMBOK improves project success and standardization.

Diagram

PMBOK
↓
Processes + Tools + Best Practices
↓
Project Management
↓
Successful Project

Conclusion

PMBOK provides the knowledge, while Project Management applies that knowledge in real projects.

Q8. Online Shopping Case Study using PMBOK Concepts.

Project

Develop an Online Shopping Website.

PMBOK Application

1. Initiating

- Define objectives.
- Identify stakeholders.

2. Planning

- Prepare schedule.
- Estimate cost.
- Identify risks.

3. Executing

- Design website.
- Develop modules.
- Integrate payment gateway.

4. Monitoring & Controlling

- Monitor progress.
- Test website.
- Control cost and quality.

5. Closing

- Deliver website.
- Obtain customer approval.
- Prepare final documentation.

Knowledge Areas Used •

- Scope Management
- Cost Management
- Schedule Management
- Quality Management
- Risk Management
  Communication Management

UNITE 2

Q1.Explain Agile Manifesto and Agile Principles.

Definition

Agile is a software development methodology that focuses on **customer satisfaction, flexibility, collaboration, and continuous improvement** through iterative development.

Agile Manifesto (4 Core Values)

1. Individuals and interactions **over** processes and tools.
2. Working software **over** comprehensive documentation.
3. Customer collaboration **over** contract negotiation.
4. Responding to change **over** following a plan.

Agile Principles (Any Six)

- Customer satisfaction through early delivery.
- Welcome changing requirements.
- Deliver working software frequently.
- Business people and developers work together.
- Face-to-face communication is preferred.
- Working software is the primary measure of progress.
- Maintain a sustainable development pace.
- Continuous attention to quality.
- Simplicity is essential.
- Self-organizing teams.
- Regular reflection and improvement.
- Continuous improvement.

Q2. Explain the Scrum Framework with roles and responsibilities.

Definition

Scrum is an Agile framework used to develop software in short iterations called **Sprints**.

Diagram

ProductBacklog

↓

Sprint Planning

↓

Sprint(2–4 Weeks)

↓

DailyScrum

↓

SprintReview

↓

SprintRetrospective

Scrum Roles

1. Product Owner

- Defines product vision.
- Manages Product Backlog.
- Prioritizes requirements.
- Represents customer.

2. Scrum Master

- Facilitates Scrum meetings.
- Removes obstacles.
- Ensures Scrum rules are followed.
- Supports the team.

3. Development Team

- Designs and develops software.
- Performs testing.
- Delivers working product.
- Self-organized team.

Responsibilities

- Deliver working software every Sprint.
- Collaborate continuously.
- Improve product quality.
- Accept customer feedback.

Q3. Differentiate Agile vs Non-Agile.

Agile	Non-Agile
Flexible	Fixed
Customer involvement is high	Customer involvement is low
Frequent software delivery	Delivery at the end
Easily accepts changes	Difficult to change
Continuous testing	Testing after development
Suitable for dynamic projects	Suitable for stable projects

UNITE 2

Q4.Differentiate Plan-Driven vs Agile Development.

Plan-Driven	Agile
Detailed planning before development	Planning is iterative
Fixed requirements	Changing requirements accepted
Heavy documentation	Minimal documentation
Sequential process	Incremental process
Customer involved mainly at start/end	Continuous customer involvement
Long release cycle	Frequent releases

Conclusion

Q5. Explain Extreme Programming (XP) and its practices.

Definition

Extreme Programming (XP) is an Agile software development methodology that focuses on **high-quality software, continuous feedback, and customer satisfaction**.

XP Practices

1. Pair Programming
2. Test-Driven Development (TDD)
3. Continuous Integration
4. Small Releases
5. Simple Design
6. Refactoring
7. Coding Standards
8. Customer On-site

Advantages

- Better software quality.
- Faster feedback.
- Fewer defects.
- Improved teamwork.
- Higher customer satisfaction.

Q6. Explain Scheduling and Tracking in Agile.

Scheduling

Scheduling in Agile is done using **Sprints**. Activities include:

- Product Backlog
- Sprint Planning
- Sprint Backlog
- Daily Scrum
- Sprint Review

Tracking

Progress is tracked using:

- Daily Scrum Meeting
- Burndown Chart
- Task Board (To Do, In Progress, Done)
- Sprint Review
- Velocity

Diagram

To Do → In Progress → Testing → Done

Advantages

- Tracks progress daily.
- Detects delays early.
- Improves productivity.
- Better team coordination.

Conclusion

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Q7. Explain the Three Stages of an Agile Project.

Stage 1 – Pre-Project (Planning)

- Identify customer requirements.
- Define project scope.
- Prepare Product Backlog.

Stage 2 – Development

- Sprint Planning.
- Coding and Testing.
- Daily Scrum Meetings.
- Sprint Reviews.

Stage 3 – Release and Maintenance •

- Deliver software.
- Collect customer feedback.
- Fix defects.
  Release updates.

Diagram

Planning

↓

Development (Sprints)

↓

Release&Maintenance

CONCLUSION

UNITE 2

Q8.Online Shopping Agile Case Study.

Project

Develop an **Online Shopping Website** using Agile.

Product Backlog

- User Registration
- Login
- Product Search
- Shopping Cart
- Payment Gateway
- Order Tracking

Sprint 1

- Registration
- Login

Sprint 2

- Product Catalog
- Search

Sprint 3

- Shopping Cart
- Payment

Sprint 4

- Order Tracking
- Testing
- Deployment

Agile Benefits

- Early software delivery.
- Customer feedback after each Sprint.
- Easy requirement changes.
- Better software quality.

UNITE 3

Q1.Explain the Project Planning Process.

Definition

Project Planning is the process of defining project objectives, scope, schedule, resources, budget, and risks before execution.

Diagram

Project Objectives
↓
Scope Planning
↓
Resource Planning
↓
Scheduling
↓
Risk Planning
↓
Budget Planning
↓
Project Plan

Steps in Project Planning

1. Define Objectives
- Identify project goals.
- Define expected outcomes.

2. Define Scope
- Decide project boundaries.
- Prepare Work Breakdown Structure (WBS).

3. Resource Planning
- Allocate manpower.
- Assign equipment and materials.

4. Schedule Planning
- Estimate activity duration.
- Prepare project schedule.

5. Risk Planning
- Identify possible risks.
- Prepare mitigation strategies.

6. Budget Planning
- Estimate project cost.
- Allocate funds.

Q2. Explain the Gantt Chart with an example.

Definition

A **Gantt Chart** is a bar chart used to plan, schedule, and monitor project activities over time.

Example

Activity Week1 Week2 Week3 Week4

Planning
Design
Development
Testing
Deployment

Advantages •
- Shows project schedule clearly.
- Tracks project progress.
- Helps allocate resources.
- Identifies delays.
- Improves coordination.
- Easy to understand.

Limitations
- Difficult for large projects.
- Does not show task dependencies clearly.

Q3. Explain PERT Technique.

Definition

PERT (Program Evaluation and Review Technique) is a project scheduling technique used when activity time is uncertain.

Formula

Expected Time (TE)

TE = (O + 4M + P) / 6

Where:
- O = Optimistic Time
- M = Most Likely Time
- P = Pessimistic Time

Steps
- Identify activities.
- Estimate three time values.
- Calculate expected time.
- Draw PERT network.
- Find project completion time.

Advantages
- Handles uncertain activity durations.
- Improves planning.
- Identifies critical activities.
- Better risk management.
- Suitable for research and software projects.

Conclusion

UNITE 3

Q4. Explain Critical Path Method (CPM).

Definition

CPM (Critical Path Method) is a project scheduling technique used to determine the **longest sequence of activities** that must be completed on time.

Diagram

Start
↓
A
↓
B
↓
C
↓
Finish

Critical Path =A → B → C

Steps

- List all activities.
- Identify dependencies.
- Estimate activity duration.
- Draw network diagram.
- Calculate critical path.
- Monitor critical activities.

Advantages

- Identifies critical tasks.
- Prevents project delays.
- Improves scheduling.
- Better resource utilization.
- Easy project monitoring.

Q5. Compare PERT and CPM.

PERT	CPM
Probabilistic technique	Deterministic technique
Activity time is uncertain	Activity time is fixed
Uses three time estimates	Uses one time estimate
Suitable for R&D and software projects	Suitable for construction and manufacturing
Focuses on time	Focuses on time and cost
Used when uncertainty is high	Used when activities are predictable

Conclusion

PERT is suitable for uncertain projects, whereas CPM is suitable for projects with fixed activity durations.

Q6. Explain the Role of Project Manager.

Definition

A **Project Manager** is responsible for planning, executing, monitoring, controlling, and successfully completing a project.

Roles and Responsibilities

-
- Plans the project.
- Defines project scope.
- Allocates resources.
- Manages project budget.
- Leads and motivates the team.
- Communicates with stakeholders.
- Identifies and manages risks.
- Monitors project progress.
- Ensures quality.
  Delivers the project on time.

Skills Required

- Leadership
- Communication
- Decision-making
- Problem-solving
- Time management

Q7. Objectives of Activity Planning.

Definition

Activity Planning is the process of identifying, organizing, and scheduling project activities.

Objectives

- Define all project activities.
- Establish activity sequence.
- Estimate activity duration.
- Allocate resources efficiently.
- Complete the project on time.
- Reduce project risks.
- Improve coordination.
- Monitor project progress.

Conclusion

UNITE 3

Q8.Activities, Sequencing, and Scheduling.

Activities

Project activities are individual tasks required to complete a project.

Sequencing

Activities are arranged in the correct order based on dependencies.
Example:

RequirementAnalysis
↓
Design
↓
Coding
↓
Testing
↓
Deployment

Scheduling

Scheduling assigns start time, end time, and duration to each activity.

Benefits

- Proper workflow.
- Better resource utilization.
- Timely project completion.
- Easier monitoring.

Conclusion

Proper sequencing and scheduling improve project efficiency and reduce delays.

Q9. Microsoft Project.

Definition

Microsoft Project is project management software used for planning, scheduling, resource allocation, and project tracking.

Features

- Gantt Charts
- Resource Management
- Budget Planning
- Progress Tracking
- Report Generation
- Task Scheduling

Advantages

- Easy planning.
- Better scheduling.
- Resource optimization.
- Improved monitoring.
- Professional reporting.

Conclusion

Microsoft Project helps organizations manage projects efficiently from planning to completion.

Q10. Primavera P6.

Definition

Oracle Primavera P6 is enterprise project management software widely used for planning and controlling large and complex projects.

Features

- Project Scheduling
- Resource Management
- Risk Management
- Cost Control
- Portfolio Management
- Progress Tracking

Advantages

- Suitable for large projects.
- Handles multiple projects.
- Accurate scheduling.
- Better cost management.
- Effective project monitoring.

Conclusion

Primavera P6 is a powerful tool for managing large-scale projects efficiently.

UNITE 4

Q1. Explain the Project Execution Process.

Definition

Project Execution is the phase in which the project plan is implemented to produce the desired product or service.

Diagram

Project Plan

↓

Resource Allocation

↓

Task Execution

↓

Quality Assurance

↓

Communication

↓

Deliverables

Steps in Project Execution

1. Allocate resources.
2. Assign tasks to team members.
3. Execute project activities.
4. Ensure quality standards.
5. Communicate with stakeholders.
6. Monitor project progress.
7. Deliver project outputs.

Q2. Explain Task Assignment, Tracking, and Monitoring.

Definition

Task Assignment, Tracking, and Monitoring ensure that project work is assigned properly and completed on time.

1. Task Assignment

- Assign work according to skills.
- Define responsibilities.
- Set deadlines.
- Allocate resources.

2. Task Tracking

- Monitor task progress.
- Compare planned vs actual work.
- Update project status.
- Identify delays.

3. Task Monitoring

- Review project performance.
- Resolve issues.
- Take corrective actions.
- Ensure quality.

Benefits

- Better coordination.
- Timely completion.
- Increased productivity.
- Easy progress monitoring.

Q3. Explain Schedule Control, Budget Control, and Quality Control.

1. Schedule Control

- Compare actual schedule with planned schedule.
- Identify delays.
- Take corrective actions.
- Update project schedule.

2. Budget Control

- Monitor project expenses.
- Compare actual cost with budget.
- Reduce unnecessary costs.
- Prevent cost overruns.

3. Quality Control

- Inspect project deliverables.
- Detect defects.
- Ensure customer requirements are met.
- Improve product quality.

Q4. Explain Earned Value Management (EVM).

Definition

Earned Value Management (EVM) is a project performance measurement technique that compares planned work, completed work, and actual cost.

Important Terms

- **PV (Planned Value)** – Planned cost of scheduled work.
- **EV (Earned Value)** – Value of completed work.
- **AC (Actual Cost)** – Actual cost spent.

Formulas

- **SV = EV – PV**
- **CV = EV – AC**
- **SPI = EV / PV**
- **CPI = EV / AC**

Advantages

- Measures project performance.
- Detects delays.
- Controls project cost.
- Supports decision-making.

Conclusion

UNITE 4

Q5.Solve SPI, CPI, SV, and CV Numericals.

Formulas

Schedule Variance (SV)

SV = EV – PV

Cost Variance (CV)

CV = EV – AC

Schedule Performance Index (SPI)

SPI = EV / PV

Cost Performance Index (CPI)

CPI = EV / AC

Example

Given:

- PV = ₹100,000
- EV = ₹90,000
- AC = ₹95,000

Solution

SV = 90,000 – 100,000 = **–10,000**

CV = 90,000 – 95,000 = **–5,000**

SPI = 90,000 / 100,000 = **0.90**

CPI = 90,000 / 95,000 = **0.95**

Interpretation

- SV < 0 → Project is **behind schedule**.
- CV < 0 → Project is **over budget**.
- SPI < 1 → Schedule performance is poor.
- CPI < 1 → Cost performance is poor.

Conclusion

These formulas help evaluate project health and support timely corrective actions.

Q6. Explain the Risk Management Process.

Definition

Risk Management is the process of identifying, analyzing, responding to, and monitoring project risks.

Diagram

RiskIdentification

↓

RiskAnalysis

↓

RiskResponse Planning

↓

RiskMonitoring

Steps

1. Identify risks.
2. Analyze risks.
3. Prioritize risks.
4. Develop response plans.
5. Monitor risks.
6. Review effectiveness.

Conclusion

Risk management minimizes project uncertainty and increases the chances of project success.

Q7. Explain Risk Identification and Analysis.

Risk Identification

It is the process of finding possible risks that may affect the project.

Methods

- Brainstorming
- Expert opinion
- Checklists
- SWOT Analysis
- Previous project records

Risk Analysis

It evaluates the probability and impact of identified risks.

Types

- Qualitative Analysis
- Quantitative Analysis

Benefits

- Better planning.
- Risk prioritization.
- Improved decision-making.
- Reduced project failures.

UNITE 4

Q8. Explain Risk Response Planning.

Definition

Risk Response Planning is the process of selecting actions to reduce the impact of project risks.

Strategies

1. Avoid

Eliminate the risk completely.

2. Mitigate

Reduce the probability or impact.

3. Transfer

Transfer the risk to another party (e.g., insurance).

4. Accept

Accept the risk and prepare a contingency plan.

Benefits

- Reduces losses.
- Improves project success.
- Better decision-making.
- Increases stakeholder confidence.

Conclusion

Proper risk response planning minimizes the effect of project risks.

Q9. Explain Risk Monitoring and Review.

Definition

Risk Monitoring is the continuous process of tracking identified risks throughout the project.

Activities

- Monitor existing risks.
- Identify new risks.
- Review response plans.
- Update the risk register.
- Conduct risk meetings.
- Take corrective actions.

Benefits

- Early detection.
- Better control.
- Continuous improvement.
- Increased project success.

Q10. Project Reporting and Communication.

Definition

Project reporting communicates project progress, issues, and performance to stakeholders.

Types of Reports

- Progress Report
- Status Report
- Cost Report
- Risk Report
- Quality Report

Importance

- Improves communication.
- Supports decision-making.
- Tracks project performance.
- Increases transparency.
- Enhances stakeholder satisfaction.

Conclusion

Regular reporting and communication ensure smooth project execution and stakeholder coordination.

Q11. Project Performance Measurement.

Definition

Project Performance Measurement evaluates project progress against planned objectives.

Techniques

- Earned Value Management (EVM)
- Key Performance Indicators (KPIs)
- Milestone Analysis
- Variance Analysis
- Quality Metrics

Benefits

- Measures project progress.
- Identifies deviations.
- Supports corrective actions.
- Improves project control.
- Ensures successful completion.

Conclusion