

## SEPM ASSIGNMENT - 2

Q1. Differentiate between CPM & PERT.

PERT	CPM
<ul style="list-style-type: none"> <li>Pert stands for Project Evaluation &amp; Review Technique</li> <li>PERT is a technique of project management which is used to manage uncertain activities of any project.</li> <li>It is event oriented technique which means that network is constructed on the basis of event.</li> <li>It is a probability model.</li> <li>It majority focuses on time as meeting time target or estimation of percent completion cost is more important.</li> <li>It has non-repetitive nature of job</li> <li>It is suitable for projects which required research &amp; development.</li> </ul>	<ul style="list-style-type: none"> <li>CPM stands for critical path method.</li> <li>CPM is a technique of project management which is used to manage only certain activities of any project.</li> <li>It is activity oriented technique which means that network is constructed on the basis of activities.</li> <li>It is a deterministic model.</li> <li>It majority focuses on time &amp; cost trade off as minimizing cost is more important.</li> <li>It has repetitive nature of job.</li> <li>It is suitable for construction projects.</li> </ul>

Q2. Explain the difference between  
(i) Total slack & free slack

### Total slack

- The amount of time an activity can be delayed without delaying the project completion.
- If an activity's total slack is used up, it may impact the project deadline.
- $\text{Total Slack} = \text{Latest Finish Time} - \text{Earliest Finish Time}$
- Activities on the critical path have zero total slack.
- If total slack is zero, any delay in the activity will extend the project duration.

### Free slack

- The amount of time an activity can be delayed without delaying its immediate successor.
- If an activity has free slack, it can be delayed without affecting subsequent tasks.
- $\text{Free Slack} = \text{Earliest Start Time of Next Activity} - \text{Earliest Finish Time of Current Activity}$
- Free slack is available only for non-critical activities.
- A task with free slack can be delayed without impacting dependent tasks.

### (Q8) AON & AOA Diagrams

#### AON

- Activities are represented as nodes (rectangles or circles).

#### AOA Diagrams

- Activities are represented as arrows between nodes.

- Nodes are connected by arrows showing dependencies.
- Dummy activity is not required as all relationships are clearly defined.
- easier to read & interpret
- Preferred in modern project management software
- easier to identify the critical path.
- Nodes represent events or milestones, while arrows indicate activities.
- Dummy activity is required to maintain logical relationships & dependencies.
- More complex due to the use of dummy activities
- Used mainly in PERT
- Requires careful tracking of events to determine the critical path.

Q3. Explain Risk identification, risk projection, Rmmm plan in detail.

Risk management is a critical part of software project management to minimize potential threats & ensure project success. It involves three major steps:

① Risk Identification :

It is the process of recognizing potential risks that can negatively impact the project. These risks may arise from various sources, such as technical challenges, resource constraints or external factors.

Types of Risks in software projects :

① Project Risks :

Affect project schedule, budget & resources. Example: Unrealistic

deadlines, budget overruns, etc.

(P) Technical Risks: Related to software development, technology & implementation. Example: System failures, integration issues, etc.

(PE) External Risks: Factors beyond the project team's control. Example: Regulatory changes, natural disasters, etc.

Risk Identification Techniques:

- Brainstorming: Team discussion to list all possible risks.
- Checklist analysis: Reviewing a predefined list of risks.
- SWOT analysis: Identifying strengths, weaknesses, opportunities & threats.

## ② Risk Projection (Risk Estimation / Assessment)

It involves analyzing identified risks to determine their likelihood & impact on the project.

Risk Assessment Parameters:

### (1) Probability of Risk Occurrence

- High (Almost certain)
- Medium (Possible)
- Low (Unlikely)

### (2) Impact on Project

- High Impact: Critical project failure
- Medium Impact: Delays
- Low Impact: Minor issues

Risk Exposure = Probability of Risk  $\times$  Potential Loss

For e.g., If the probability of a risk is 0.3 (30%) & the estimated loss is 10000Rs, the risk exposure is:  $0.3 \times 10000 = 3000$

This helps prioritize which risks need more attention.

### ③ RISK MITIGATION, MONITORING & MANAGEMENT (Rmmm) Plan

The Rmmm plan consists of strategies to handle risks at different stages of the project.

Three key aspects of Rmmms:

#### ① Risk Mitigation (Reducing Risks)

- Preventive actions to reduce the likelihood of risks occurring. Example: Using experienced developers to avoid technical risks.
- It's a proactive management strategy that can be used in business, IT, & other areas.
- Risk mitigation strategies:

(i) Risk avoidance: Avoid actions that could lead to unwanted risk.

(ii) Risk acceptance: Determine an appropriate response or treatment for the risk.

(iii) Risk reduction: Lower the prob. of the risk.

#### ② Risk monitoring:

- It's a continuous process of identifying, analyzing & managing risks throughout a business's lifecycle, ensuring the organization's risk landscape is vigilantly monitored & the risk management plan is adjusted as needed.
- Example: Regular status meetings to identify early warning signs.

#### ③ Risk Management (Handling risks if they occur)

- Contingency plans to respond to risks if they materialize.
- Involves analyzing the likelihood & impact of risks & developing strategies to minimize harm.
- Example: Hiring additional resources if there are delays.

Q4. Consider a XYZ company under take a project to computerized working of ABC City Bank, then,  
 (i) Develop WBS for the same project

A work breakdown structure (WBS) divides the project into manageable tasks & subtasks for better planning & execution.

WBS for Bank Computerization Project:

① Requirement Analysis & Planning

- Identify banking operations to be computerized
- Gather requirements from stakeholders
- Define project scope & objectives
- Conduct feasibility study
- Prepare project schedule & budget

② System Design & Architecture

- Design system architecture
- Define database schema
- Develop UI/UX ~~parameters~~ wireframes
- Identify hardware & software requirements

③ Software Development

- Develop core banking application
- Implement customer account management system
- Develop online banking module
- Integrate security & authentication features

④ Testing & Quality Assurance

- Unit testing of individual components
- Integration testing of modules
- Security testing for vulnerabilities
- User acceptance testing (UAT)

### ⑤ Deployment & Training

- Deploy system in a test environment
- Migrate existing data to new system
- Train bank employees on new system
- Go-live & monitor performance

### ⑥ Maintenance & Support

- Set up customer support system
- Monitor system performance
- Provide regular updates & bug fixes

### (PP) Responsibility Assignment Matrix (RAM)

A RAM assigns roles & responsibilities to different team members for each task.

Task	Proj Manager	Business Analyst	Developers	ST Security Team	Testers	Bank Staff
1) Req.gathering	A	R	C	I	I	C
2) System Design	A	C	R	C	I	I
3) Software Dev	I	I	R	C	I	I
4) Securing	I	I	C	R	I	I
5) Testing	I	C	C	R	R	I
6) Deployment	A	C	R	R	C	I
7) Training support	A	R	C	C	I	R

R - Responsible

A - Accountable

C - Consulted

I - Informed

Q5 Explain software configuration management in detail.

Software Configuration Management (SCM) is a critical discipline in software engineering that focuses on systematically managing, organizing & controlling changes throughout the software development lifecycle.

Key components of SCM:

(i) Configuration Identification: This involves identifying & labelling all configuration items within the software system such as source code, documentation & test cases to facilitate accurate tracking & management.

(ii) Configuration control: This component manages the configuration items, ensuring that all modifications are systematically evaluated, approved & documented to prevent unauthorized changes & maintain system stability.

(iii) Configuration Auditing: Regular audits are conducted to verify that the software conforms to its requirements & that the SCM processes are being followed correctly, ensuring the integrity & quality of software project.

Benefits of SCM:

- Consistency
- Traceability
- Collaboration
- Quality Assurance.

In summary, Software Configuration Management is essential for effective software development & maintenance, providing a structured approach to managing changes & ensuring that software products are developed in a controlled, efficient & high-quality manner.

Q6. Explain the significance of Gantt charts in project management.

A Gantt chart is a visual project management tool that depicts tasks as horizontal bars along a timeline, illustrating their start & finish dates. This format offers a clear overview of a project's schedule, task durations & overlaps, facilitating effective planning & coordination.

Significance of Gantt charts in project management:

(i) Comprehensive Project Overview:

They visually represent the entire project timeline, detailing tasks, durations & sequences aiding in understanding the project's scope & progression.

(ii) Enhanced Communication:

By clearly outlining task schedules & responsibilities, Gantt charts promote transparency among team members & stakeholders, ensuring alignment with the project plan.

(iii) Effective Time Management:

Gantt charts assist in scheduling tasks with defined start & end dates, facilitating better allocation of time & resources, helping meet deadlines & identifying potential bottlenecks early.

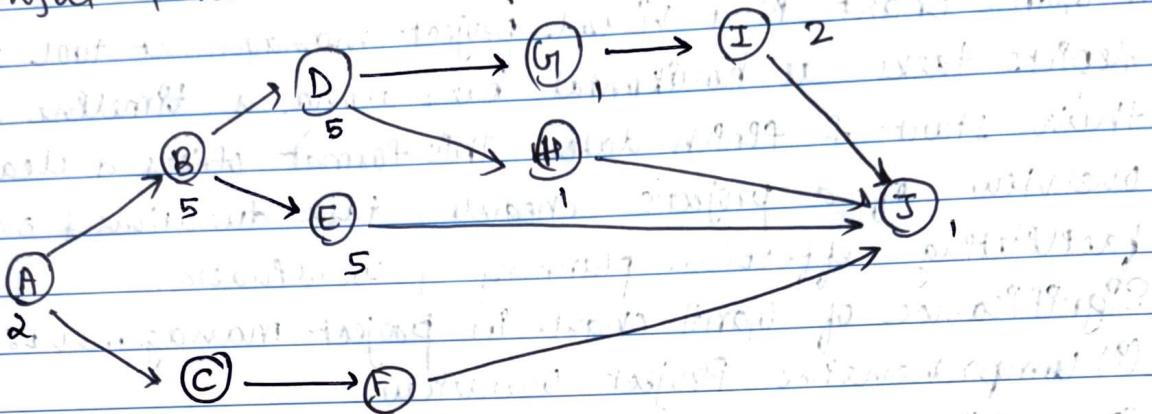
(iv) Progress Tracking:

They allow monitoring of task completion against the planned schedule, making it easier to identify delays & implement corrective actions promptly.

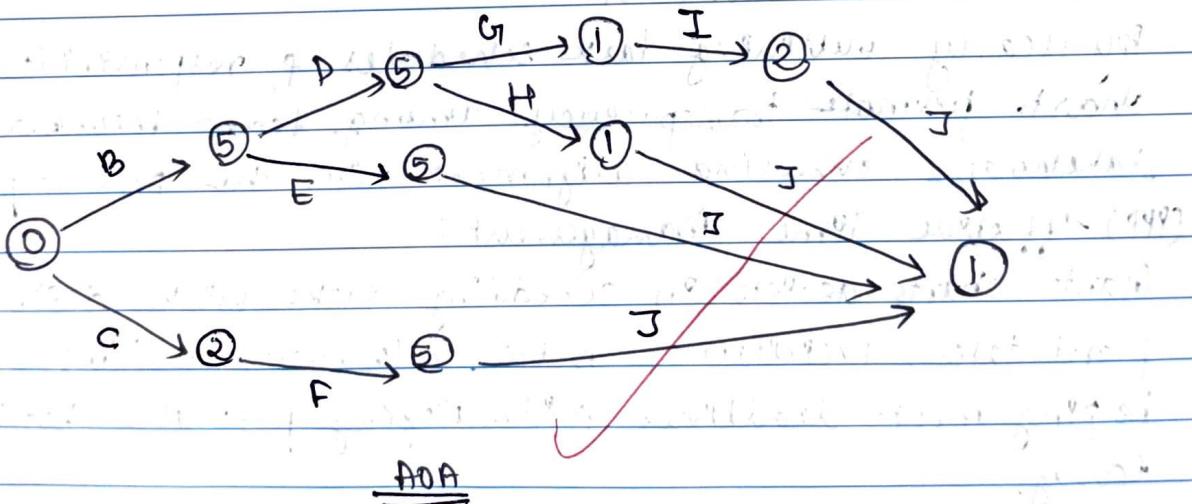
(v) Resource Allocation:

By visualizing task assignments, Gantt charts help distribute workload evenly among team members, preventing overburdening and ensuring optimal utilization of resources.

Q1. Draw the AON & AOA network diagram for the following project & show critical path

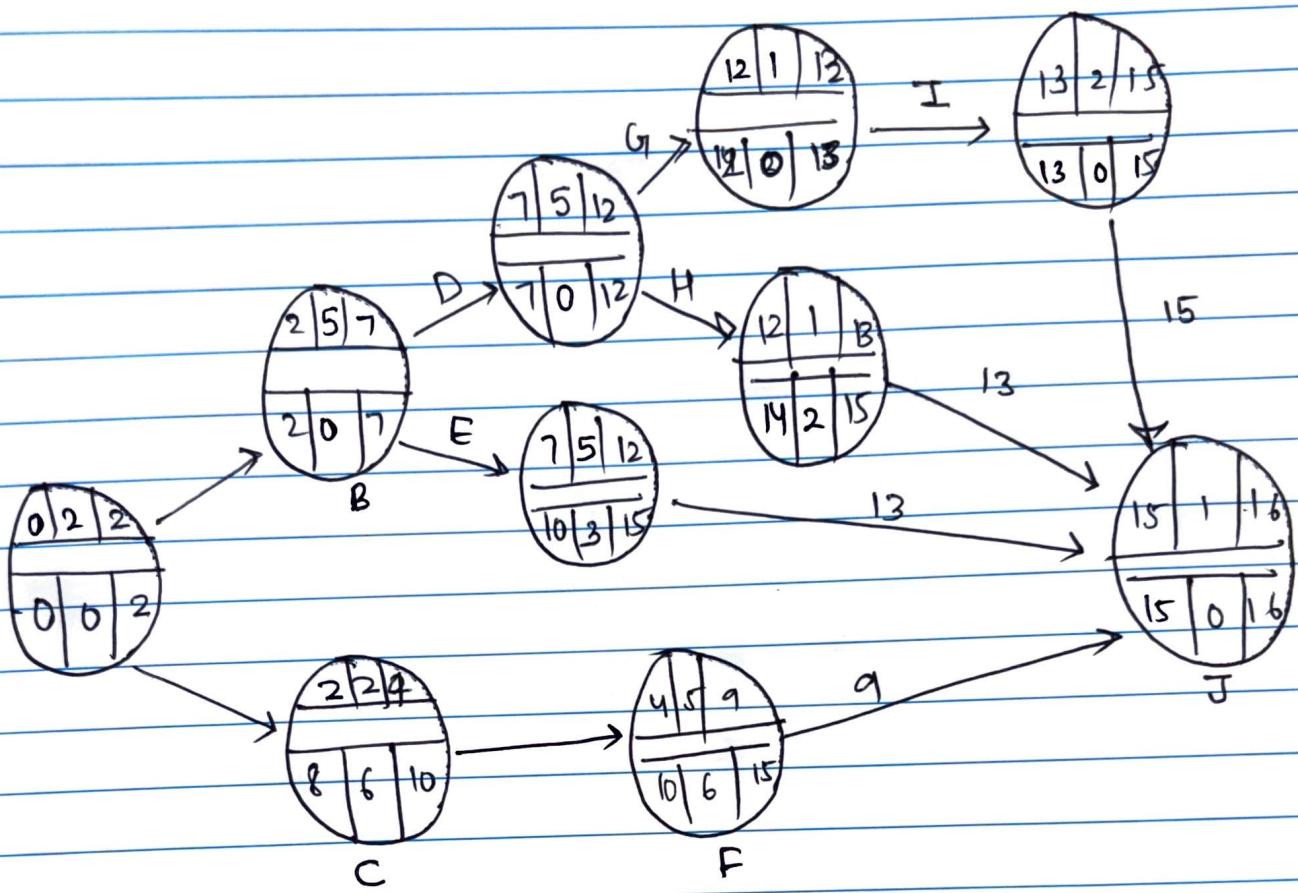


AON



AOA

For critical path:



Critical path:

$A \rightarrow B \rightarrow D \rightarrow G \rightarrow I \rightarrow J$