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SEPM :- Assignment No. 02

Q.) Differentiate b/w CPM and PERT

Sol:-

PERT stands for Project evaluation and review technique.

- ① PERT stands for Project evaluation and review technique

- ② It is a technique of project management which is used to manage uncertain activities of any project.

- ③ It is probabilistic model.

- ④ Appropriate for high precision time estimation.

- ⑤ Non repetitive nature of job.

- ⑥ No chance of crashing as there is no certainty of time.

CPM stands for Critical Path method.

- ① CPM stands for critical Path method.

- ② It is a technique of project management which is used to only certain activities of any project.

- ③ It is deterministic model.

- ④ Appropriate for reasonable time estimation.

- ⑤ Repetitive nature of job.

- ⑥ May crash because of certain time bound.

Q.2) Explain the diff. b/w Total slack and free slack.

Sol:- Total slack :-

- ① It is the amount of slack time a task can be delayed without delaying the project overall completion date.
- ② It is calculated as the difference between late finish and early finish of a task.
- ③ If total slack is negative it means the project is behind schedule and needs compression techniques like crashing or fast tracking.
- ④ If total slack is zero, the task is on the critical path.

Free slack :-

- ① It is the amount of time a task can be delayed without delaying the start time of the successor task.
- ② It is useful for identifying tasks that can be postponed without affecting dependent activities.
- ③ If free slack is zero, any dependent delay in the task will immediately affect at least one successor task.

key difference:-

- ① Total slack affects the entire project completion whereas free slack affects immediate successor tasks.
- ② A task can have free slack but still have total slack but not vice versa.
- ③ Free slack is always equal to less than total slack.

ii)

Now and AOA diagrams.

SOL:- Activity on Node (AON) Diagram.

In AON diagrams, activities are represented by nodes (boxes) and dependencies between them are shown with arrows.

Key characteristics:-

- Nodes represent project activities.
- Arrows indicate dependencies b/w activities
- used in precedence diagramming method which allows for different type of relationships.

① Finish to start

② Start to finish.

③ Start to start,

④ Finish to finish

Advantages:-

More flexible and widely used  
can represent lead and lag times effectively.

Activity on Arrow (AOA):—

In AOA activities are represented by arrows, while nodes (circle) represent the start and end points of activities.

Key characteristics:-

- ① Arrow represents activities.
- ② Node represents centre.
- ③ Uses only finish to start relationship.

Advantages:-

- ① Clearly shows dependencies and critical path.
- ② Simpler for small projects.

(Q3) Explain risk identification, risk projection, RMM plan in detail

Sol:- Risk identification is the process of recognizing potential risk that could negatively impact a project system.

Key steps include:

- Understanding project scope
- SWOT analysis
- checklist based approach.
- Categorical Risks:-
  - a) Technical Risk
  - b) External Risk
  - c) Financial Risk
  - d) External Risk

Risk projection also known as risk estimation or risk assessment involves analyzing the identified risks in terms of their likelihood, impacts and priority.

This helps in decision making regarding mitigation strategies

Key steps include:-

- ① Probability assessment :— Estimate the chance of risk occurring.
- ② Impact analysis :— Determines the severity of consequences if the risk occurs.
- ③ Risk exposure calculation :—  $RE = P \times I$

Risk mitigation, monitoring & management (RMM) stands for:-

Risk mitigation :— It is defined as strategies to prevent risk from occurring or reduce their impact.

Risk Monitoring :— Continuous tracking of risk indicators and warning signs.

Eg :— Monitoring system helps for potential security threats.

~~Risk Management~~ :— Developing response plans for different risk scenarios.

Eg :— Having a backup API provider in case primary API fails.

- Q4) Consider a xyz company undertake a project to computerized working at ABC city Bank.
- Ans:- i) Develop WBS for same project  
ii) Develop responsibility matrix.

Ans:- xyz company undertaken a project as follows:-

- i) Work Breakdown Structure (WBS) for computerized ABC City Bank :-

A WBS is a hierarchical decomposition of tasks required to complete a project. It breaks down project into manageable components.

Level 1 :- Project Computerization of ABC City Bank

- a) Requirement Analysis & Planning :-

- i) Gather business requirements.
- ii) Define project scope and objectives
- iii) Identify hardware / software needs.

b) System Design & Architecture :-

- i) Database design
- ii) UI/UX design for banking interface
- iii) Develop system workflow.

c) Software Development & Integration :-

- i) Develop core banking software.
- ii) Implement ATM, internet banking and mobile banking
- iii) Integrate with third-party financial services (VPI).

D) Hardware & Infrastructure Setup :-

- i) Install server and network infrastructure.
- ii) Setup branch computers and workstations
- iii) Implement cybersecurity measures

E) Testing & Quality Assurance :-

- ① Perform Unit Testing, Integration & System Testing.
- ② Security Testing.
- ③ Load and Performance testing.

F) Training & Deployment :-

- i) Employee training sessions.
- ii) Full Scale Development and Go-Live.

G) Maintenance & Support :-

- i) Continuous System Monitoring.
- ii) Helpdesk and Technical support.

ii) Responsibility Matrix for the Project :-

A responsibility Assignment Matrix (PAM) also known as RACI matrix, defines roles and responsibilities of team members for various tasks.

~~Responsibility Key :-~~

- a) R (Responsible) - Performs the task
- b) A (Accountable) - Approves the work
- c) C (Consulted) - Provide inputs, expert guidance
- d) I (Informed) - Needs updates but not actively involved.

Task	Project Manager	Business Analyst	Developers	IT security team	Testers	Bank staff.
Requirement gathering	A	R	C	I	I	C
System Design	A	C	R	C	I	I
Software development	I	I	R	C	T	I
Security Implementation	I	I	C	R	I	I
Testing & QA	I	C	C	R	R	I
Deployment	A	C	R	R	C	I
Training & Support	A	R	C	C	I	R

(Q.5) Explain software configuration management in detail.

Ans:- ① Configuration management is the process of identifying and defining the configuration items in a system. Controlling the release and change of these items throughout the system lifecycle, recording and reporting the status of configuration items.

② Configuration management is practiced in form or another as part of any software management engineering project where several individuals or organisation have to coordinate their activities.

- 3) While the basic concepts of configuration management are common to both hardware and software engineering projects, there are some differences in emphasis due to the nature of software products.
- 4) SCM is system for managing the evolution of software products, both during initial stages of development & during all stages of maintenance.
- 5) A software product encompasses the complete set of computer programs, procedures and associated documentation and data designated for delivery to end user.
- 6) All supporting software used in development even though not part of the software product, should also be controlled by SCM.
- 7) Advantages of SCM:-
- i) SCM provides significant benefits to all projects regardless of size, scope and complexity.
  - ii) Provides a ~~snapshot~~ of dynamically changing software.
  - iii) Tracks concurrent development of modules or components of overall system.
  - iv) organizes all concurrently developing code and associated documents.

Q.6) Explain the significance of Gantt Charts in project management.

- Ans:- i) A Gantt Chart is a visual project management tool that displays tasks, their durations, dependencies and progress over time using a bar chart format.
- ii) It plays a crucial role in planning, scheduling and tracking project activities.
- iii) Key significance :-
1. visual representation of project timeline :- Displays tasks, durations and deadlines in a bar chart format.
  2. Task scheduling and dependencies :- Helps in organizing task completion in correct sequence.
  3. Resource Allocation & Workload Management :- Ensures optimal use of resources by preventing overallocation or underutilization.
  4. Tracking progress and milestones :- Allows monitoring of task completion status.
  5. Improves communication and co-ordination :- Acts as a common reference for teams.
- ~~a) Risk Identification & mitigation~~ :- Helps in spotting potential bottlenecks early.
- iv) Benefits of Gantt Chart :-
- a) Provides a clear picture of entire project
  - b) Helps track deadlines and avoid delays
  - c) Flexible and Adaptable.

v) Limitations of Gantt - Chart :-

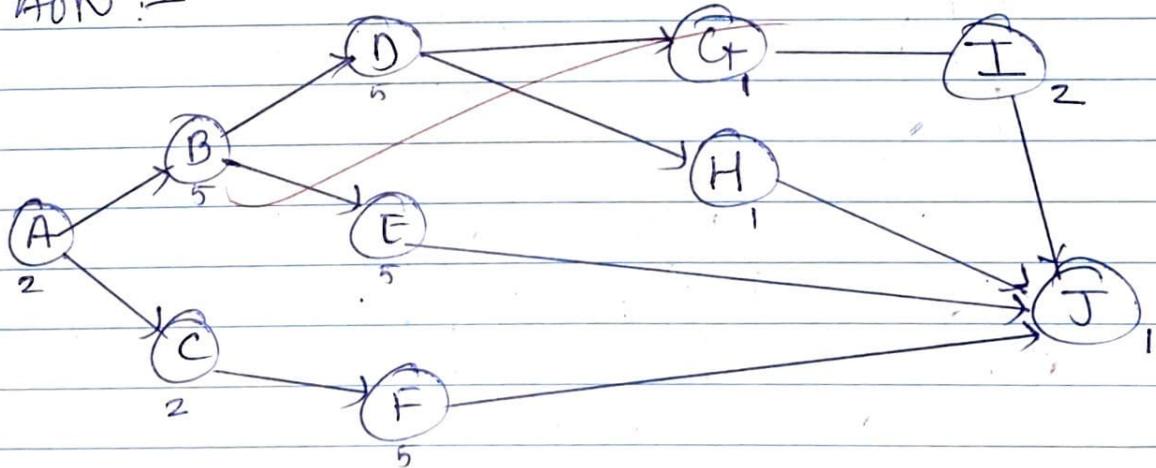
- Time consuming to update.
- Can become cluttered with too many tasks.
- Shows what need to be done but not how.

Q. A) Draw the AOA & AON network diagram for following Project and show critical path.

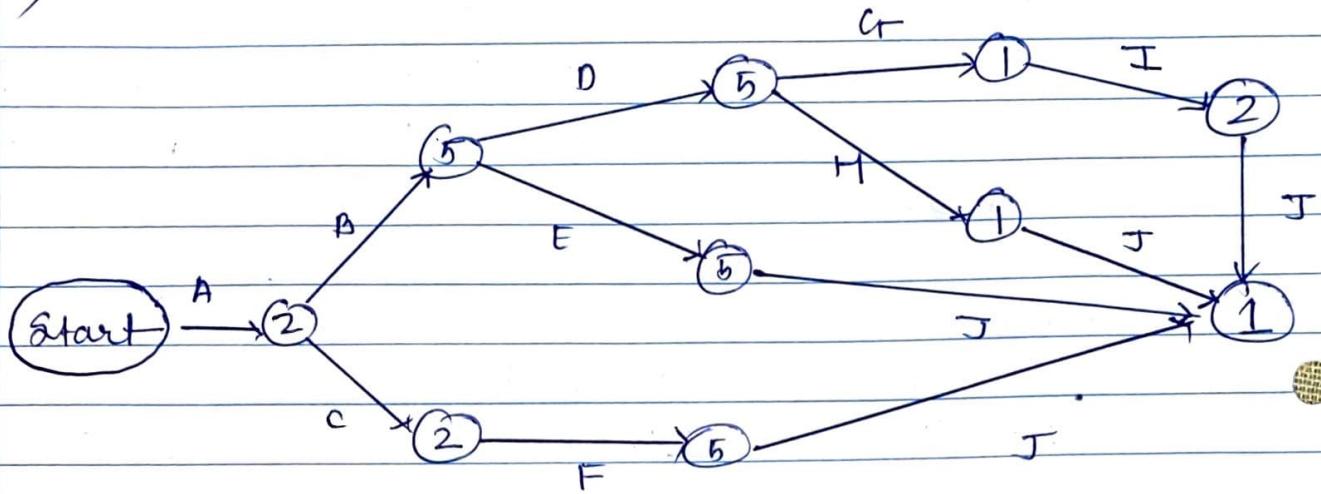
Activity	Time	Immediate Predecessor
A	2	-
B	5	A
C	2	A
D	5	B
E	5	B
F	5	C
G	1	D
H	1	D
I	2	G
J	1	E, F, H, I

Ans:- SDI :-

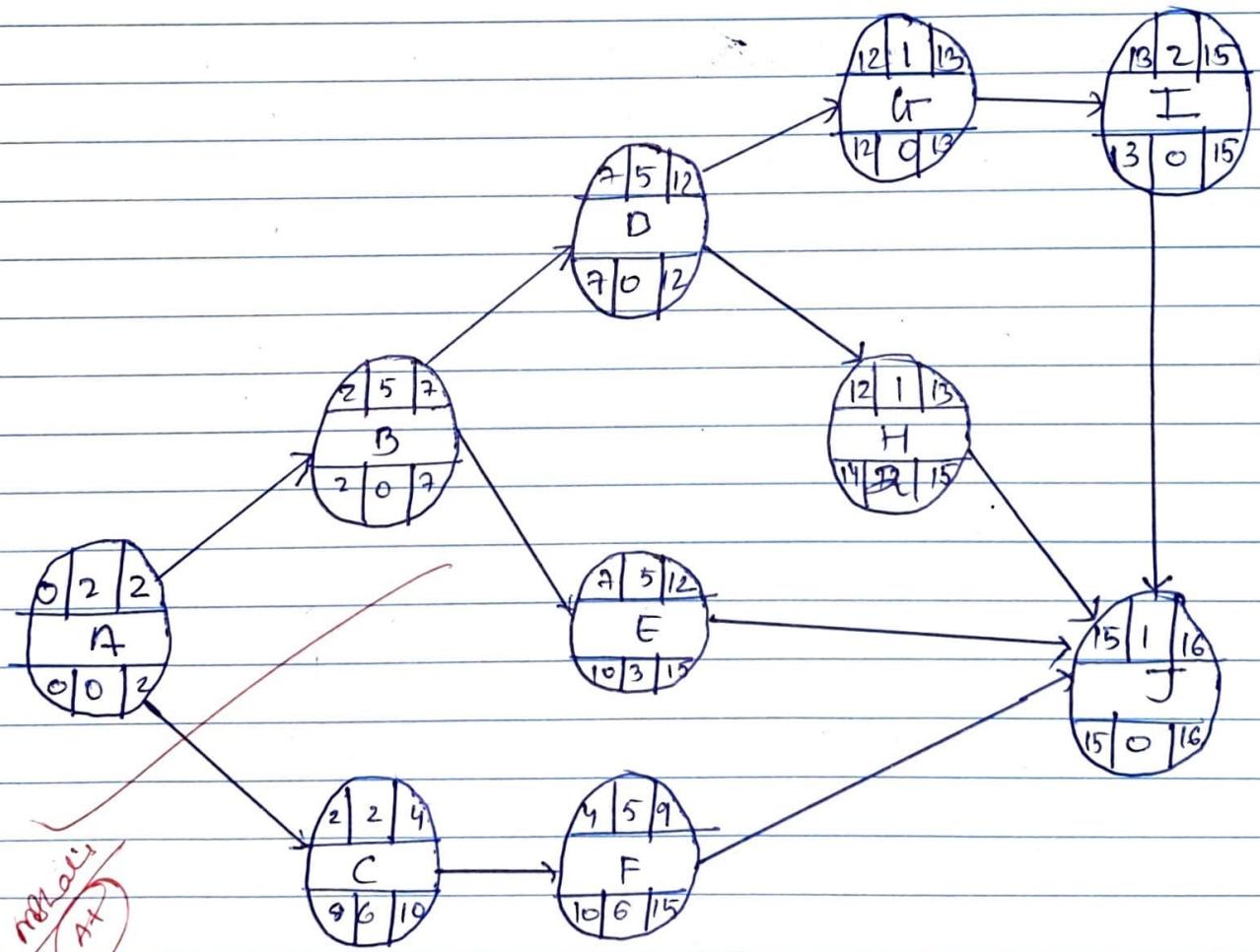
i) AON :-



ij) AOA :-



Now, For Critical Path:-



∴ Critical Path :— A → B → D → G → I → J