

CPM

&

PERT

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Syllabus

- 1) Basics of Project Management
- 2) Elements of Network.
- 3) Analysis of Network $\left\{ \begin{array}{l} \rightarrow \text{PERT} \\ \rightarrow \text{CPM} \end{array} \right.$
- 4) Time-Cost Model (Crashing)
- 5) Miscellaneous Topics

PERT

110



(1)

BASICS OF PROJECT MGMT.

②

PROJECT:

A Project is a set of related activities undertaken to achieve a particular goal or objective within specific constraint.

PROJECT MANAGEMENT

It is an art of achieving the project objectives by utilizing all its resources as effectively as possible.

The resources includes human resources, machine, material resources, financial resources, space etc.

"A Project is said to be complete only when all its activities involved in it project is 100% complete".

Objectives of PM

- 1) It must be completed in Min. Time.
- 2) It must be completed with Min. Capital Investment.
- 3) It must utilise its resources as sparingly as possible.

Basic Elements of PM

1) Planning: It is the 1st stage in which its resource is analysed & the feasibility of attaining its objectives is determined.

2) Scheduling: It is the stage in which various resources are assigned to various activities within specific constraints.

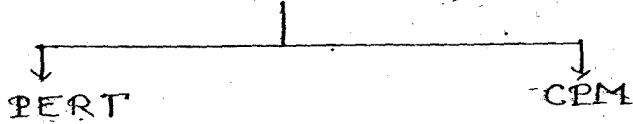
In this phase times are allotted to various activities in a logical or in a sequential manner.

NOTE: Both Planning & Scheduling are done before the actual start of project.

Methods of Scheduling (1)

~~Methods of Scheduling~~ Charts

Network Methods



UNETICS,
PRIMAVERA,
TOBS, SPYDER
SCANS etc.

- 1) Bar chart
- 2) Linked Bar chart
— "MS-PROJECT"
- 3) Mild Stone Bar chart

3) Monitoring & Controlling :

It is the execution of planning & scheduling. If there is any deviation from the proposed plan & schedule, it also deals with Rescheduling.

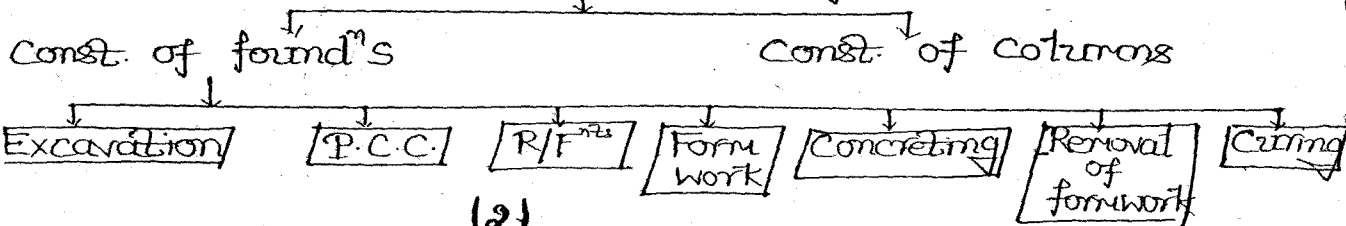
* WORK BREAK-DOWN STRUCTURE (WBS)

→ WBS is a systematic, Hierarchical, top-down approach in which the ultimate objective is broken down into a no. of small & easily manageable units.

→ Resource identification & resource Mgmt. can be easily accomplished with the help of WBS.

Eg.

WBS
Hierarchy / Top-Down
Constⁿ of Building



(2)

ELEMENTS OF A NETWORK

NETWORK :

• A Network is a Graphical representation of the whole project. The Network can be of the following types —

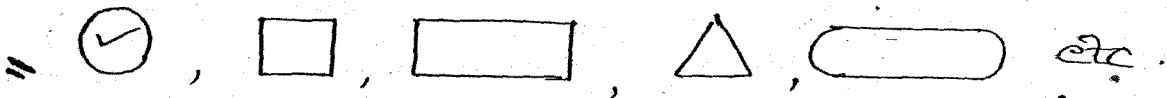
- 1) Activity on Arrow (AOA) → CPM / PERT
- 2) Activity on Node (AON) → CPM (Representation)

- For Analysis purposes, AOA Network is adopted.
- For easy Representation, AON
- AOA Network is used in both PERT & CPM whereas AON Network only CPM (for representation purposes).

1) AOA Network

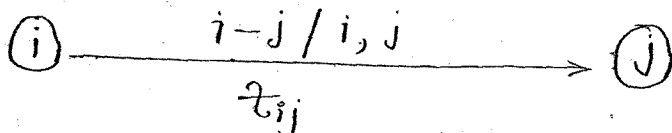
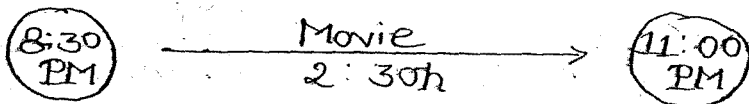
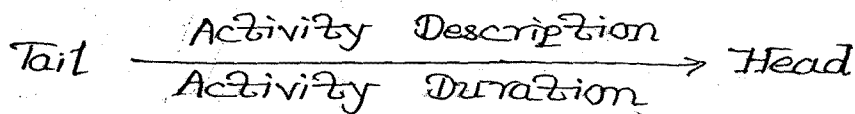
- The AOA Network has foll. 2 basic elements -
- 1) Event
- 2) Activity / Job / Task

1) Event: An event is a specific instant of time where a particular task can be started or a particular task can get completed. It is a deliverable recognise at a specific instant of time. It is represented by Node, usually circle.



NOTE The occurrence of an event neither consumes time nor any resources.

2) Activity: It is an actual performance of an operation in a particular project which require time as well as Resources. It is represented by "Arrow (\rightarrow)".



• Types of Event

- 1) Tail Event
- 2) Head Event
- 3) Dual Role Event.

1) Tail event: The event which marks the starting of an activity is called as its Tail Event.
If an event marks the starting of a project, it is called as Initial Event.

NOTE: An activity can start only when its tail event has occurred.

2) Head event: The event which marks the completion or finishing of an activity is called as its head event.
If a head event marks the completion of the project, it is called as Final or Finish event.

NOTE: A Head event occurs only when all activities leading to it are complete.

3) Dual Role event: The event which marks the starting of an activity & the finishing of some other activities is called as Dual Role event.

NOTE: Except initial & final event, all intermediate events are dual role events.

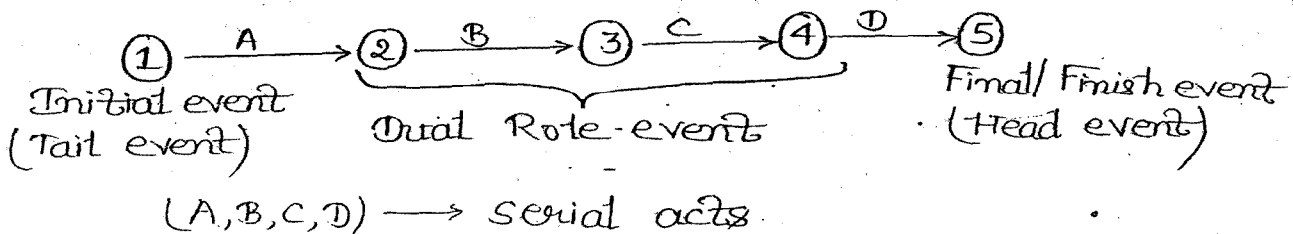
• Types of Activities:

1) Serial Activities (Dependent): It is a group of those activities which are necessarily dependent upon each other.

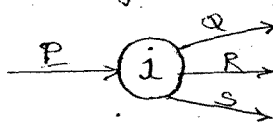
2) Parallel Activities (Independent): It is a group of activities which are independent on each other i.e. the occurrence of these activities does not depend upon the occurrence of other activities.

Examples →

1) Linear Network



2) Parts of a Network



As soon as P gets completed, Q, R & S can get started.