A LECTURE NOTE
ON
TH.1 INDUSTRIAL ENGINEERING & MANAGEMENT
SEMESTER -6

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Sr. Lecture Mechanical Engineering

Mechanical Engineering

GOVT. POLYTECHNIC, MALKANGIRI

4) **Actual techines** → It is a method to determine the network, method to minimize the bottlenecks, delays and interruptions by determining the critical factors and coordinating various activities.

objectives

- A powerful coordinating tool for planning, scheduling and controlling of projects.

- Minimisation of total project cost and time.
- Effective utilization of resources and minimisation of effective resources.
- Minimization of delay and interruption during implementation of the project.

Network: It is a graphical representation of the project and it consist of series of activities in a logical sequence.

Activities: It is a physical identifiable part of the project, which consumes time and resources.

Event: An event represents start and completion of the activities. The Beginning and end points of an activity are events.

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Tail event   Head event.

Merge event   Brust event
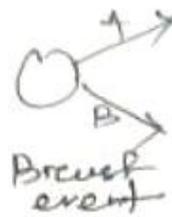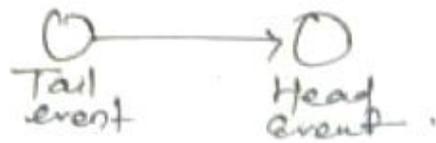
<u>Predecessor</u> : All those activities which must be completed before starting the activity under consideration are called predecessor.
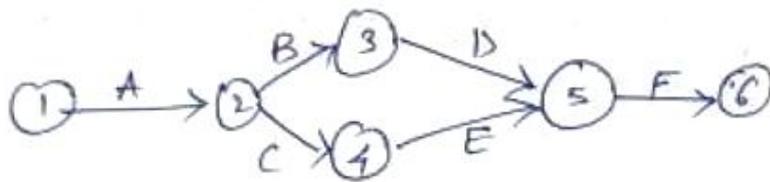
<u>Successor</u> : All those activities which have to follow the activity under consideration are called successor.
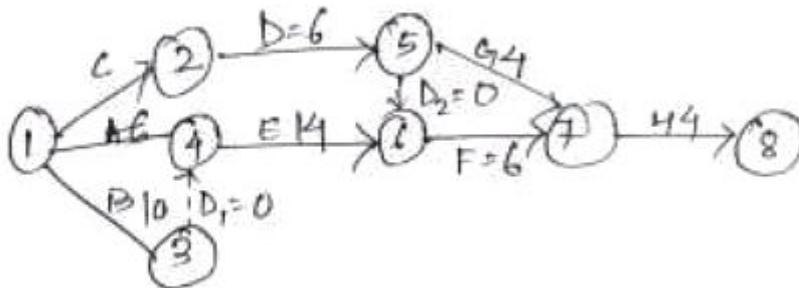
Model Questions

1) what is CPM ?
2) what is network, activity ?
3) Define predecessor and successor.

1) Actual lecture →

1. Construct the network from information given below:

Activity	Immediate Predecessors	Activity time (w)
A	—	6
B	—	10
C	—	14
D	C	6
E	A, B	14
F	E, D	6
G	D	4
H	F, G	4

Critical path Method : In CPM the activity times are known
with certainity. The path with longest time sequence
is called critical path. The length of the critical path
determines the minimum time in which the entire
project can be completed.

The activities of the critical path are called 'Critical activities.

Earliest event time

1) Earliest start time (ECT)/(ES)
2) Earliest finish time (EFT)/(EF), $EF_{ij} = ES_{ij} + t_{ij}$
3) Earliest event time $(E_{ij}) = $ Max of $(ES_{ij} + t_{ij}) = $ Max $(E_i + t_{ij})$

$\because ES_{ij} = $ Earliest start for an activity (i, j)
$E_i = $ Earliest event occurance time of event (i)

Latest Allowable Event time

1) Latest finish time (LF) for an activity (i, j) equals to the
latest event $j - LF_{ij} = L_{ij}$

2) Latest starting time activity (i, j) is the latest completion time
(i, j) minues the activity time.

$$LS_{ij} = LF_{ij} - t_{ij}$$

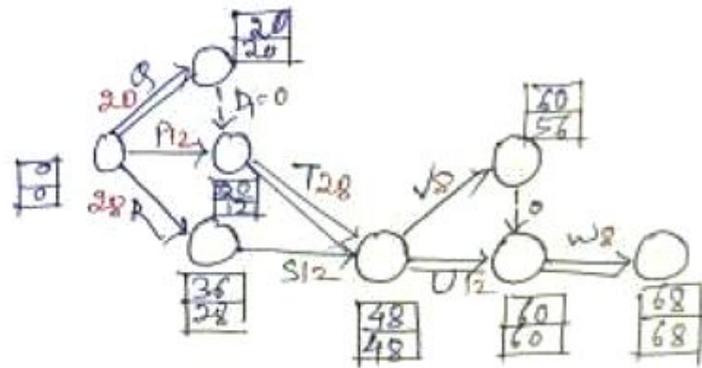3) Latest event time $L_i = $ max (LS_{ij})
Minimum $(LF_{ij} - t_{ij}) = $ Minimum $j (L_j - t_{ij})$.

Model Questions

1) Draw the network.
2) what is critical path method.

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Ⓓ Actual lecturer →

A	I.P	A.T
P	—	12
Q	—	20
R	—	28
S	R	12
T	P, Q	28
U	T, S	12
V	S	8
W	U, V	8

A	A.T	ES	EF	LS	LF	F
P	12	0	12	8	20	8
Q	20	0	20	0	20	0
R	28	0	28	8	36	8
S	12	28	48	36	48	8
T	28	20	48	20	48	0
U	12	48	60	48	6.0	0
V	8	48	56	58	60	10
U	8	60	68	60	68	0

Critical path — Q-T-U-W
duration — 20 + 28 + 12 + 8 = 68

Model Questions:
1) Draw a network and find critical path & duration.