## CRITICAL PATH METHOD

Q.1) Obtain ES, EF, LS and LF time for the following activity schedule for a project - Also calculate Total Float, Free Float and Independent Float for these activities.

| Activity | $1-2$ | $1-3$ | $1-4$ | $3-5$ | $4-5$ | $2-6$ | $5-6$ | $5-7$ | $6-8$ | $7-8$ | $8-9$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Duration <br> (weeks) | 8 | 5 | 13 | 12 | 6 | 6 | 7 | 9 | 8 | 2 | 6 |

Answer:

| ACT | DUR | ES | EF | LS | LF | HS | TS | TF | FF | INDF | INTF |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $1-2$ | 8 |  |  |  |  |  |  |  |  |  |  |
| $1-3$ | 5 |  |  |  |  |  |  |  |  |  |  |
| $1-4$ | 13 |  |  |  |  |  |  |  |  |  |  |
| $3-5$ | 12 |  |  |  |  |  |  |  |  |  |  |
| $4-5$ | 6 |  |  |  |  |  |  |  |  |  |  |
| $2-6$ | 6 |  |  |  |  |  |  |  |  |  |  |
| $5-6$ | 7 |  |  |  |  |  |  |  |  |  |  |
| $5-7$ | 9 |  |  |  |  |  |  |  |  |  |  |
| $6-8$ | 8 |  |  |  |  |  |  |  |  |  |  |
| $7-8$ | 2 |  |  |  |  |  |  |  |  |  |  |
| $8-9$ | 6 |  |  |  |  |  |  |  |  |  |  |

Q.2) A Small assembly plant assembles PC's through 9 interlinked activities. The time duration for which is given below:

| Activity | $1-2$ | $1-3$ | $1-4$ | $2-5$ | $3-6$ | $3-7$ | $4-6$ | $5-8$ | $6-9$ | $7-8$ | $8-9$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Duration | 2 | 2 | 1 | 4 | 8 | 5 | 3 | 1 | 5 | 4 | 3 |

a. Draw a Network diagram for it.
b) Calculate and tabulate for each activity: Earliest start (ES), Earliest finish (EF), Latest Start (LS) and Latest Finish (LF) times.
c) Find the critical path.
d) Calculate and tabulate Total Float, Free Float, Interfering Float and Independent Float.

Answer:

| ACT | DUR | ES | EF | LS | LF | HS | TS | TF | FF | INDF | INTF |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $1-2$ | 2 |  |  |  |  |  |  |  |  |  |  |
| $1-3$ | 2 |  |  |  |  |  |  |  |  |  |  |
| $1-4$ | 1 |  |  |  |  |  |  |  |  |  |  |
| $2-5$ | 4 |  |  |  |  |  |  |  |  |  |  |
| $3-6$ | 8 |  |  |  |  |  |  |  |  |  |  |
| $3-7$ | 5 |  |  |  |  |  |  |  |  |  |  |
| $4-6$ | 3 |  |  |  |  |  |  |  |  |  |  |
| $5-8$ | 1 |  |  |  |  |  |  |  |  |  |  |
| $6-9$ | 5 |  |  |  |  |  |  |  |  |  |  |
| $7-8$ | 4 |  |  |  |  |  |  |  |  |  |  |
| $8-9$ | 3 |  |  |  |  |  |  |  |  |  |  |

## Q.3) Determine:

a. Earliest Start time. b. Earliest finish time. c. Latest start time d. Latest finish time.
e. Free Float f. Total Float, and g. Independent float.

| Activity | $1-2$ | $1-3$ | $1-4$ | $2-5$ | $3-5$ | $3-6$ | $3-7$ | $4-6$ | $5-7$ | $6-8$ | $7-8$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Duration | 2 | 7 | 8 | 3 | 6 | 10 | 4 | 6 | 2 | 5 | 6 |

Answer:

| ACT | DUR | ES | EF | LS | LF | HS | TS | TF | FF | INDF |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $1-2$ | 2 |  |  |  |  |  |  |  |  |  |
| $1-3$ | 7 |  |  |  |  |  |  |  |  |  |
| $1-4$ | 8 |  |  |  |  |  |  |  |  |  |
| $2-5$ | 3 |  |  |  |  |  |  |  |  |  |
| $3-5$ | 6 |  |  |  |  |  |  |  |  |  |
| $3-6$ | 10 |  |  |  |  |  |  |  |  |  |
| $3-7$ | 4 |  |  |  |  |  |  |  |  |  |
| $4-6$ | 6 |  |  |  |  |  |  |  |  |  |
| $5-7$ | 2 |  |  |  |  |  |  |  |  |  |
| $6-8$ | 5 |  |  |  |  |  |  |  |  |  |
| $7-8$ | 6 |  |  |  |  |  |  |  |  |  |

Q.4) Activities involved in a small project are given below with relevant information

| Activity | $1-2$ | $1-3$ | $2-3$ | $2-4$ | $3-4$ | $4-5$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Duration | 20 | 25 | 10 | 12 | 6 | 10 |

- Construct the Network and find Critical Path
- Find and tabulate ES,EF,LS, LF and TF

Answer:

| ACT | DUR | ES | EF | LS | LF | TF |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $1-2$ |  |  |  |  |  |  |
| $1-3$ |  |  |  |  |  |  |
| $2-3$ |  |  |  |  |  |  |
| $2-4$ |  |  |  |  |  |  |
| $3-4$ |  |  |  |  |  |  |
| $4-5$ |  |  |  |  |  |  |

