System Analysis Design

Chapter 07

Managing the Information Systems Project

Outcome:

- ✓ Explain the ***process of managing an information systems*** project.
- ✓ Describe the ***skills required*** to be an effective project manager.
- ✓ List project ***management activities*** during project initiation, planning, execution, and closedown.
- ✓ Explain ***critical path scheduling***, ***Gantt charts***, and ***Network diagrams***.
- ✓ Explain the ***utility of commercial project*** management software tools.

Importance of Project Management

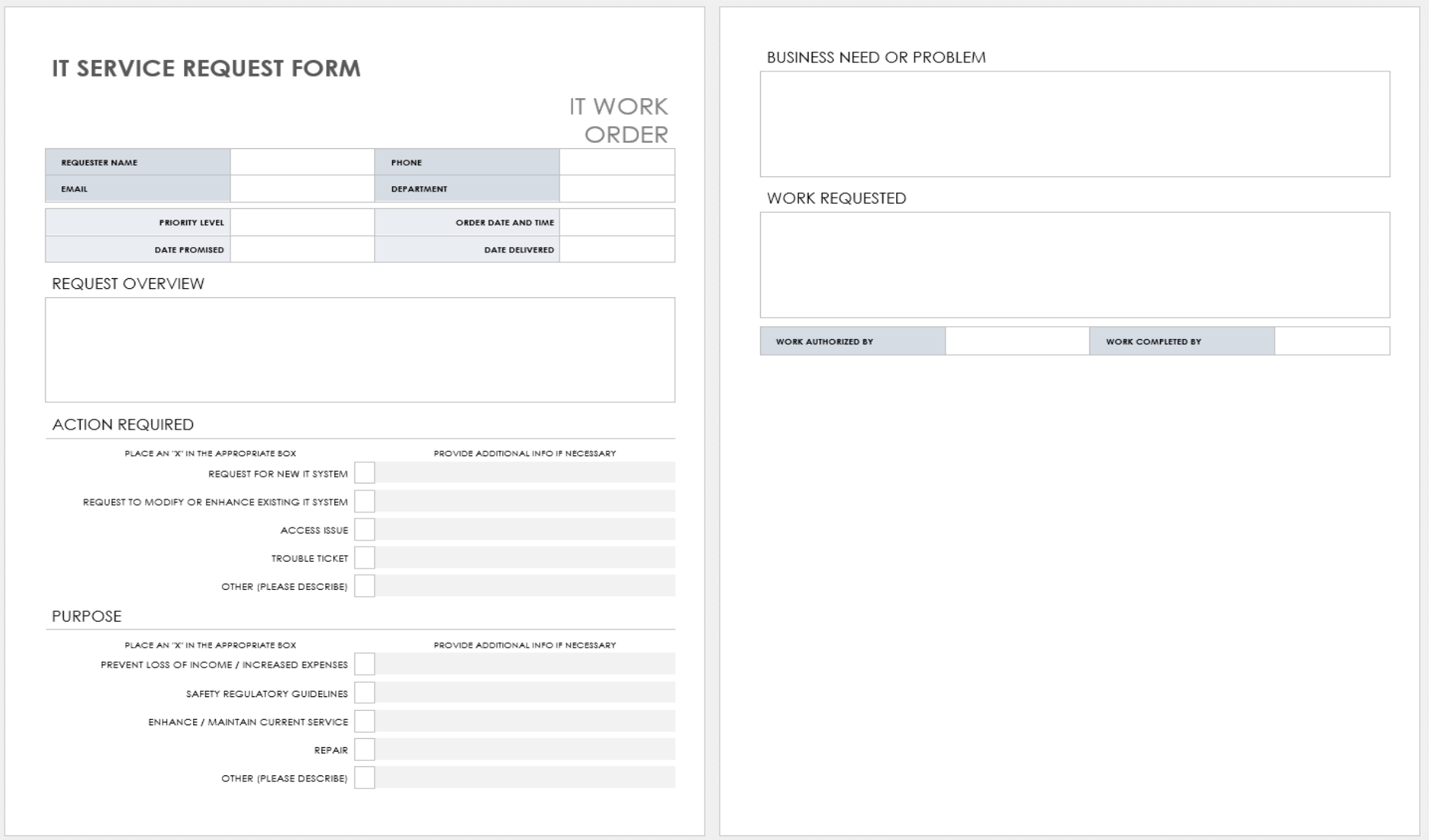
- Project management may be the most ***important aspect of systems development***.
- Effective PM helps ensure
  - Meeting ***customer expectations***
  - ***Satisfying budget*** and ***time constraints***
- PM skills are ***difficult*** and ***important to learn***.

Deciding on Systems Projects

- **System Service Request (SSR)**
  - A standard ***form for requesting or proposing systems*** development work within an organization.
- **Feasibility study**
  - A study that determines whether a requested system ***makes economic and operational sense*** for an organization.

System Service Request (SSR)

- System Service Request (SSR) is a form requesting development or maintenance of an information system. It includes the contact person, a problem statement, a service request statement, and contact information.



IT SERVICE REQUEST FORM

IT WORK ORDER

REQUESTER NAME		PHONE	
EMAIL		DEPARTMENT	

PRIORITY LEVEL		ORDER DATE AND TIME	
DATE PROMISED		DATE DELIVERED	

REQUEST OVERVIEW

ACTION REQUIRED

PLACE AN "X" IN THE APPROPRIATE BOX		PROVIDE ADDITIONAL INFO IF NECESSARY
REQUEST FOR NEW IT SYSTEM		
REQUEST TO MODIFY OR ENHANCE EXISTING IT SYSTEM		
ACCESS ISSUE		
TROUBLE TICKET		
OTHER (PLEASE DESCRIBE)		

PURPOSE

PLACE AN "X" IN THE APPROPRIATE BOX		PROVIDE ADDITIONAL INFO IF NECESSARY
PREVENT LOSS OF INCOME / INCREASED EXPENSES		
SAFETY REGULATORY GUIDELINES		
ENHANCE / MAINTAIN CURRENT SERVICE		
REPAIR		
OTHER (PLEASE DESCRIBE)		

BUSINESS NEED OR PROBLEM

WORK REQUESTED

WORK AUTHORIZED BY		WORK COMPLETED BY	

Managing the Information Systems Project

- **Project:**
  - A ***planned undertaking*** of related activities to reach an objective that has a beginning and an end.
- **Project Management:**
  - A ***controlled process*** of ***initiating***, ***planning***, ***executing***, and ***closing down*** a project.
- **Project Manager**
  - Systems analyst with ***management and leadership skills*** responsible for leading project initiation, planning, execution, and closedown
- **Deliverable**
  - The end product of an SDLC phase.

Project Management Activities

Phases of Project Management Process

- Phase 1: **Initiation**
- Phase 2: **Planning**
- Phase 3: **Execution**
- Phase 4: **Closedown**

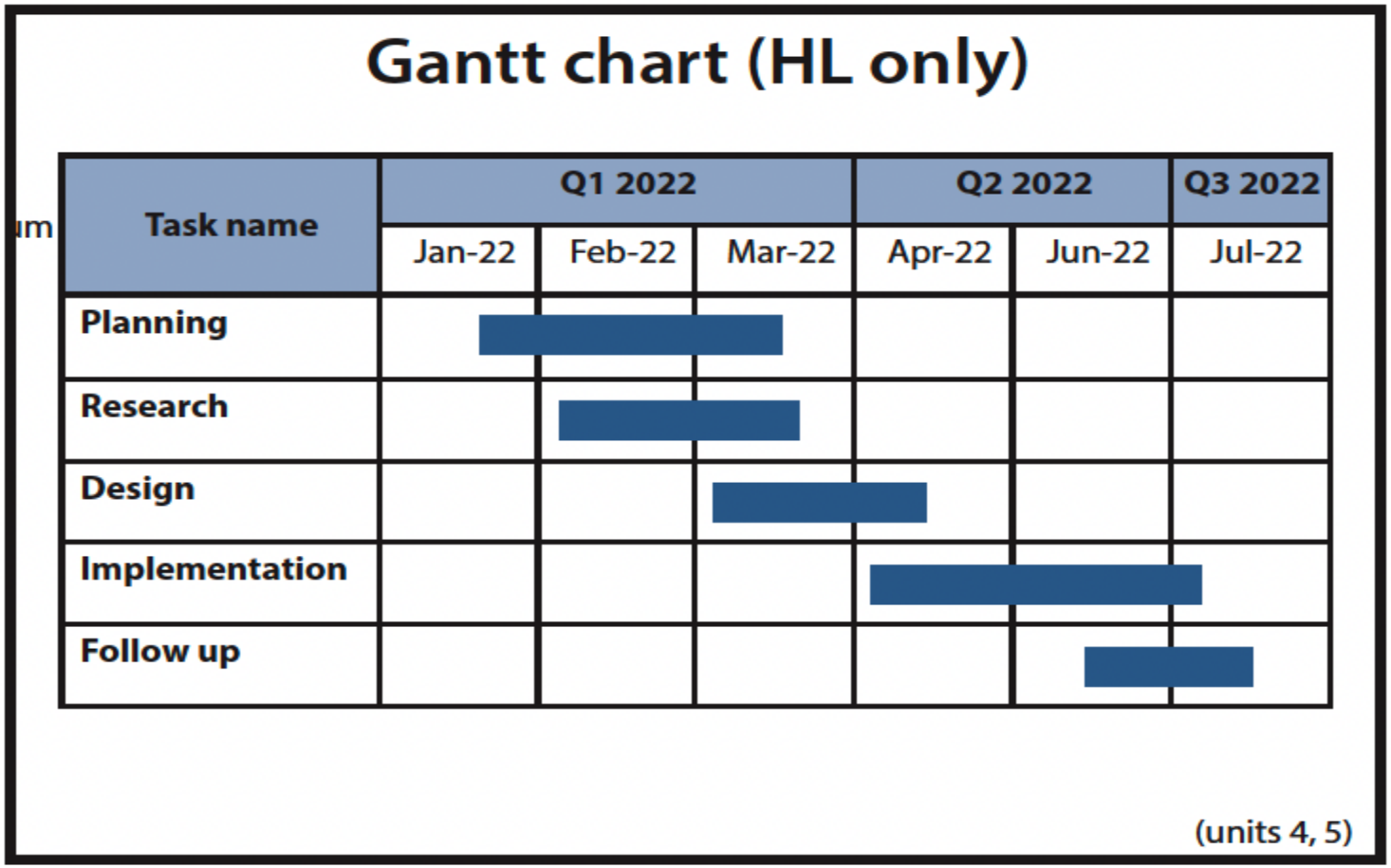
Representing and Scheduling Project Plans

- Gantt Charts
- Network Diagrams
- PERT Calculations
- Critical Path Scheduling
- Project Management Software

Gantt Charts vs. Network Diagrams

- **Gantt Charts**
  - Show ***task durations***.
  - Show ***time overlap***.
  - Show ***slack time*** in duration.
- **Network Diagrams**
  - Show ***task dependencies***.
  - Do not show time overlap, but ***show parallelism***.
  - Show ***slack time in boxes***.

Example of Gantt Chart



Estimating Task Duration

- **Program Evaluation Review Technique(PERT)**
  - Technique that uses ***optimistic (o)***, ***pessimistic (p)***, and ***realistic (r)*** time estimates to determine expected task duration.
- **Formula for Estimated Time(ET):**
  - $ET = (o + 4r + p)/6$

Example PERT Analysis

Activity	Time Estimate (in weeks) O	r	p	Expected Time(ET) $\frac{O+4r+p}{6}$
1. Requirement Collection	1	5	9	5
2. Screen Design	5	6	7	6
3. Report Design	3	6	9	6
4. Database Design	1	2	3	2
5. User Documentation	3	6	7	5.5
6. Programming	4	5	6	5
7. Testing	1	3	5	3
8. Installation	1	1	1	1

Critical Path Scheduling

- A scheduling technique whose order and duration of a sequence of task activities directly affects the ***completion date of a project.***
- ***Critical path:*** The ***shortest time*** in which a project can be completed.
- ***Slack time:*** The time an activity can be ***delayed*** without delaying the project.

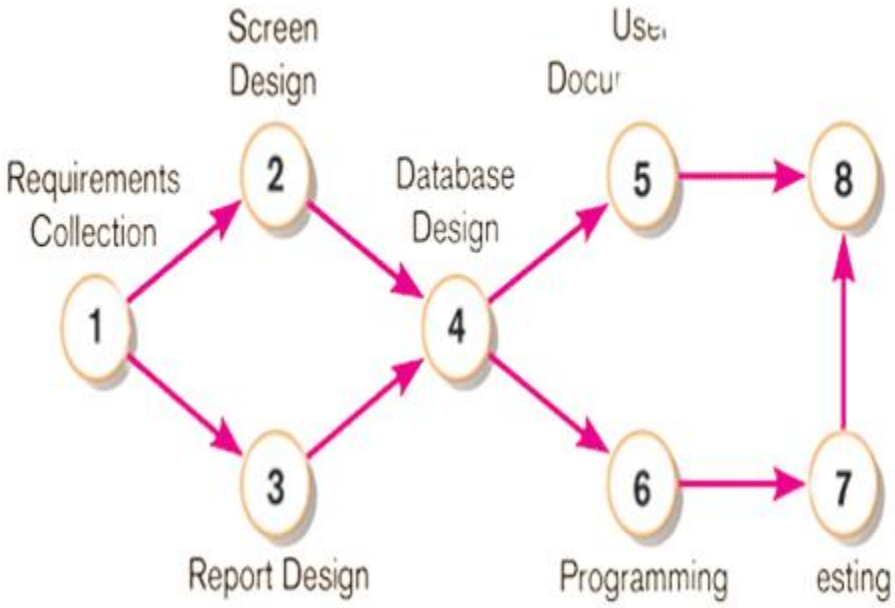
Critical Path Example (dependencies between tasks)

- **PRECEDING ACTIVITIES** indicate the activities that must be completed before the specified activity can begin.

Activity	Preceding Activity
1. Requirement Collection	-
2. Screen Design	1
3. Report Design	1
4. Database Design	2,3
5. User Documentation	4
6. Programming	4
7. Testing	6
8. Installation	5,7

Critical Path Example

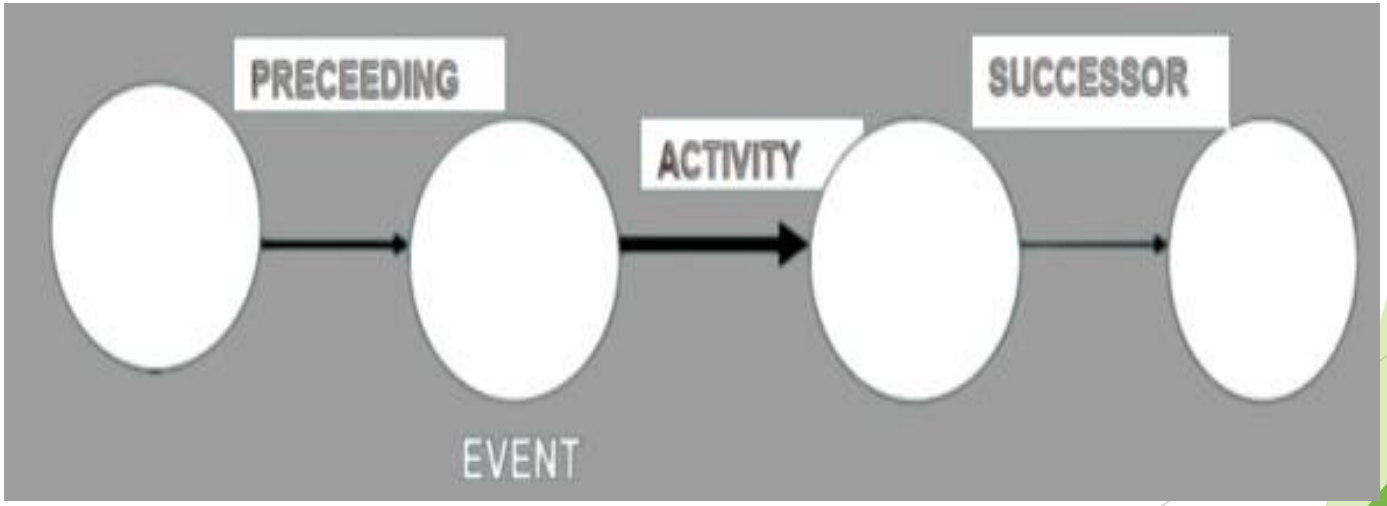
A network diagram that illustrate the ***activities(circles)*** and the ***sequence (arrow)*** of those activities



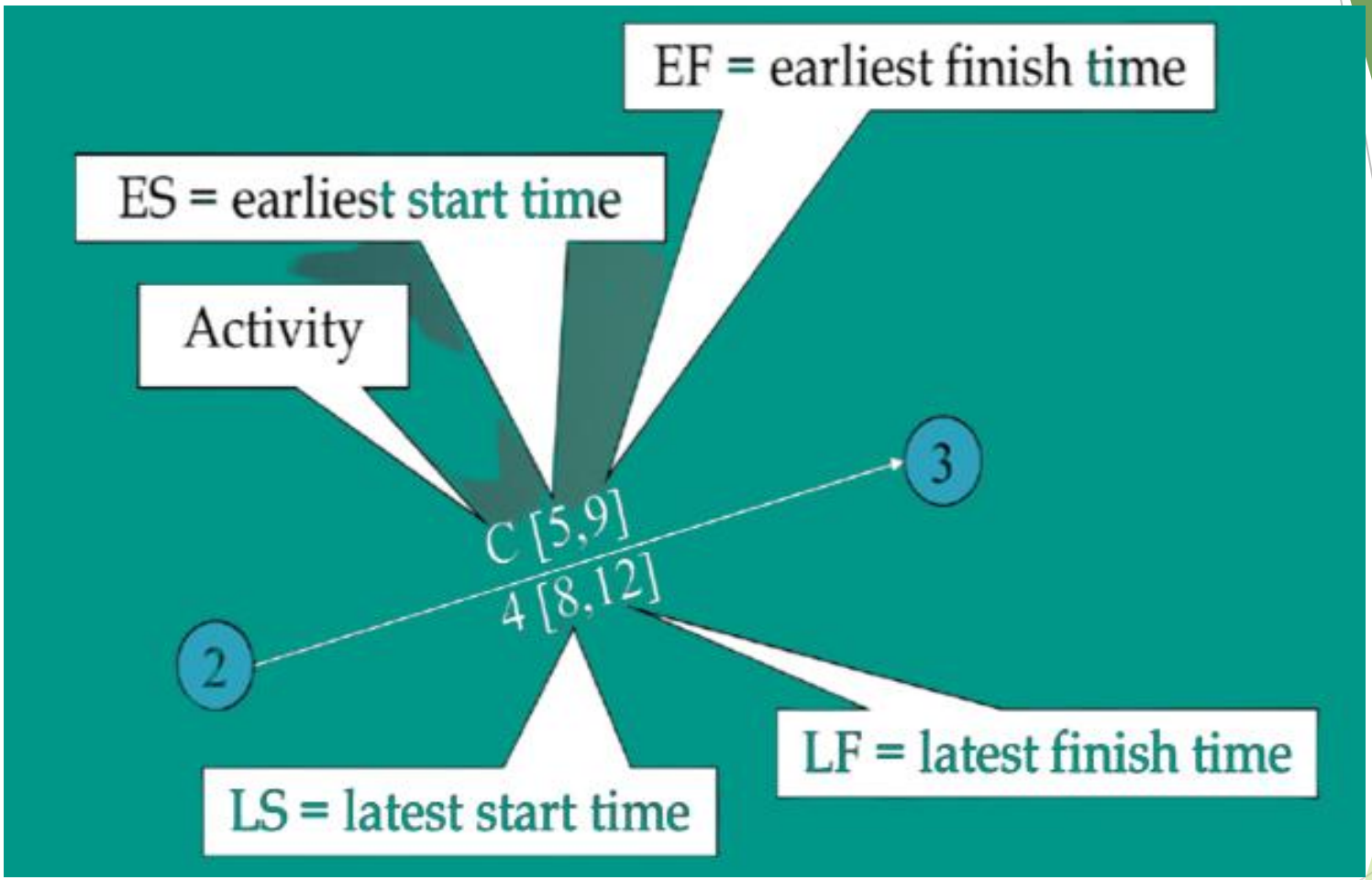
- Network diagram shows dependencies

Critical Path Elements

- **Activity**: Any portions of project (tasks) which required by project, uses up resource and consumes time-may involve labor, paper work, contractual negotiations, machinery operations Activity on Arrow (AOA) showed as arow, AON- Activity on Node.
- **Event**: Beginning or ending points of one or more activities, instantaneous point in time, also called ‘nodes’.
- **Network**: Combination of all project activities and the events.

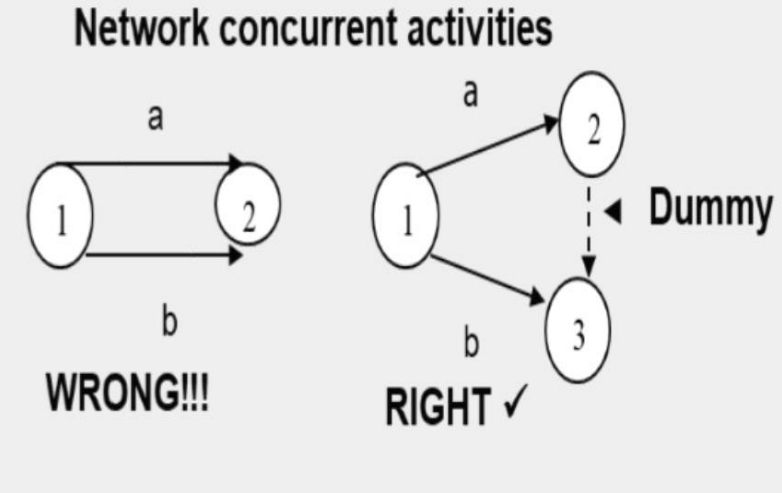


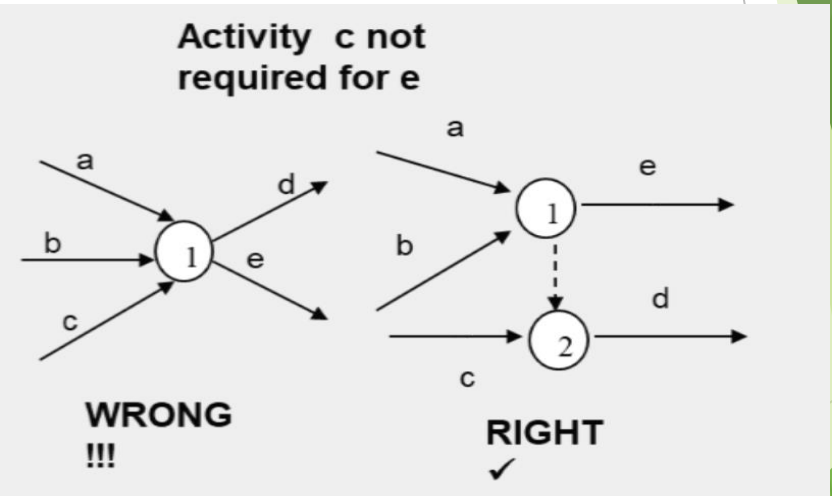
Activity, Duration, ES, EF, LS, LF



Dummy Activity

- This dotted arc is a **dummy activity**. **Dummy activities** often have a zero completion time and are used to represent precedence relationships that cannot be easily (if at all) represented **using** the actual **activities** involved in the project.
- By convention **dummies** are always shown as dotted arcs in **network diagrams**.





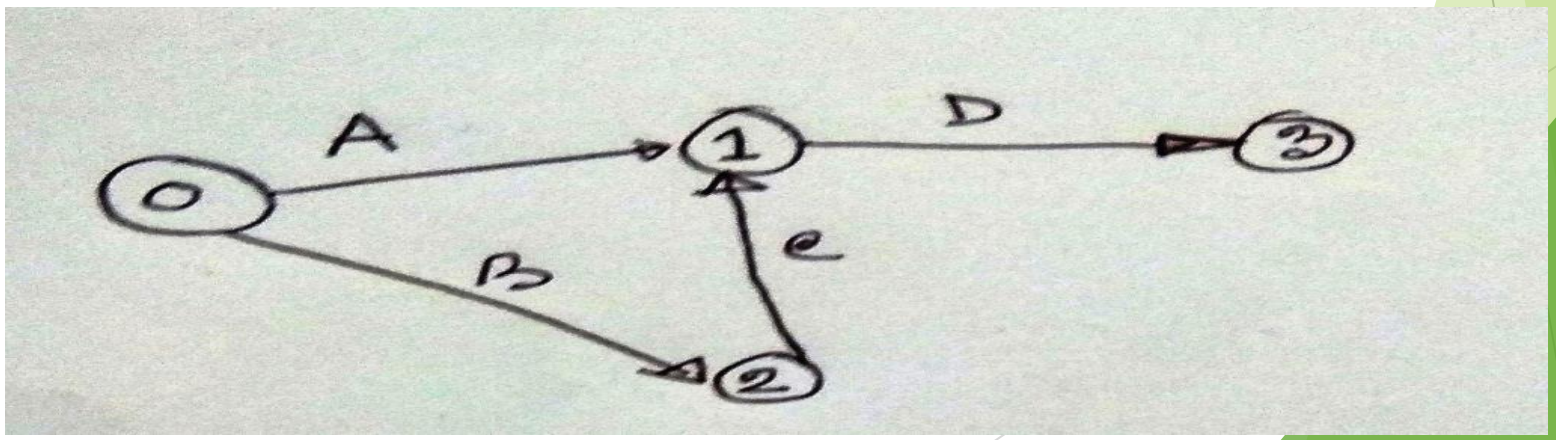
Example-1: Simple Network

- Consider the list of four activities for making a simple product:

Activity	Description	Immediate predecessors
A	Buy Plastic Body	-
B	Design Component	-
C	Make Component	B
D	Assemble product	A,C

Immediate predecessors for a particular activity are the activities that, when completed, enable the start of the activity in question.

Network Diagram



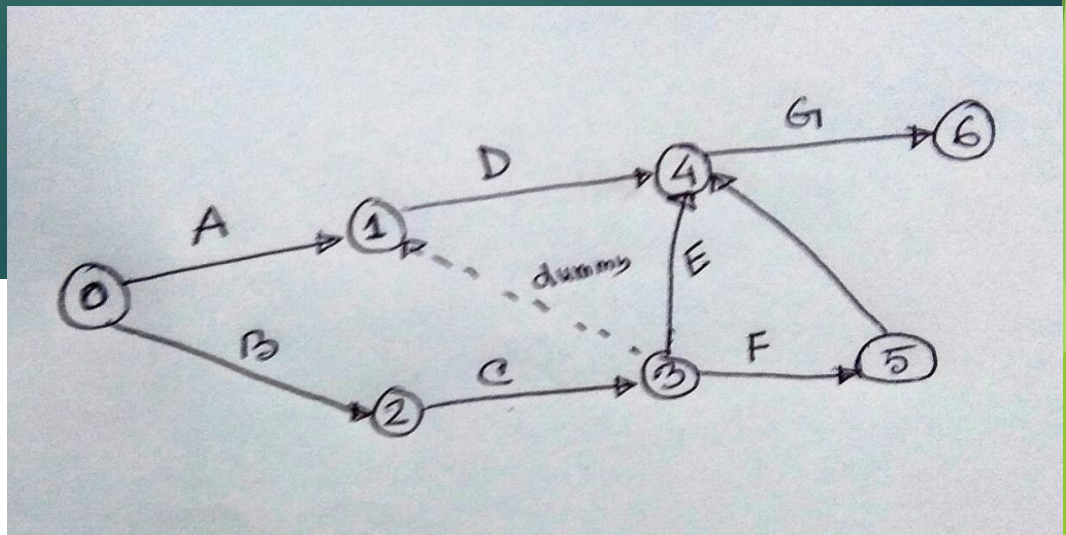
Example-2: Simple Network

Develop the network for a project with following activities and immediate predecessors:

Activity	Immediate predecessors
A	-
B	-
C	B
D	A, C
E	C
F	C
G	D,E,F

Try to do for the first five (A,B,C,D,E)

Network Diagram



Data Table

$$T_e = \frac{O + 4M + P}{6}$$

Where:

- T_e — Expected time
- O — Optimistic time
- M — Normal time
- P — Pessimistic time

Activity	Predecessor Activity	Optimistic time estimate (to days)	Most likely time estimate (tm days)	Pessimistic time estimate (tp days)
A	-	2	5	8
B	A	2	3	4
C	A	6	8	10
D	A	2	4	6
E	B	2	6	10
F	C	6	7	8
G	D, E, F	6	8	10

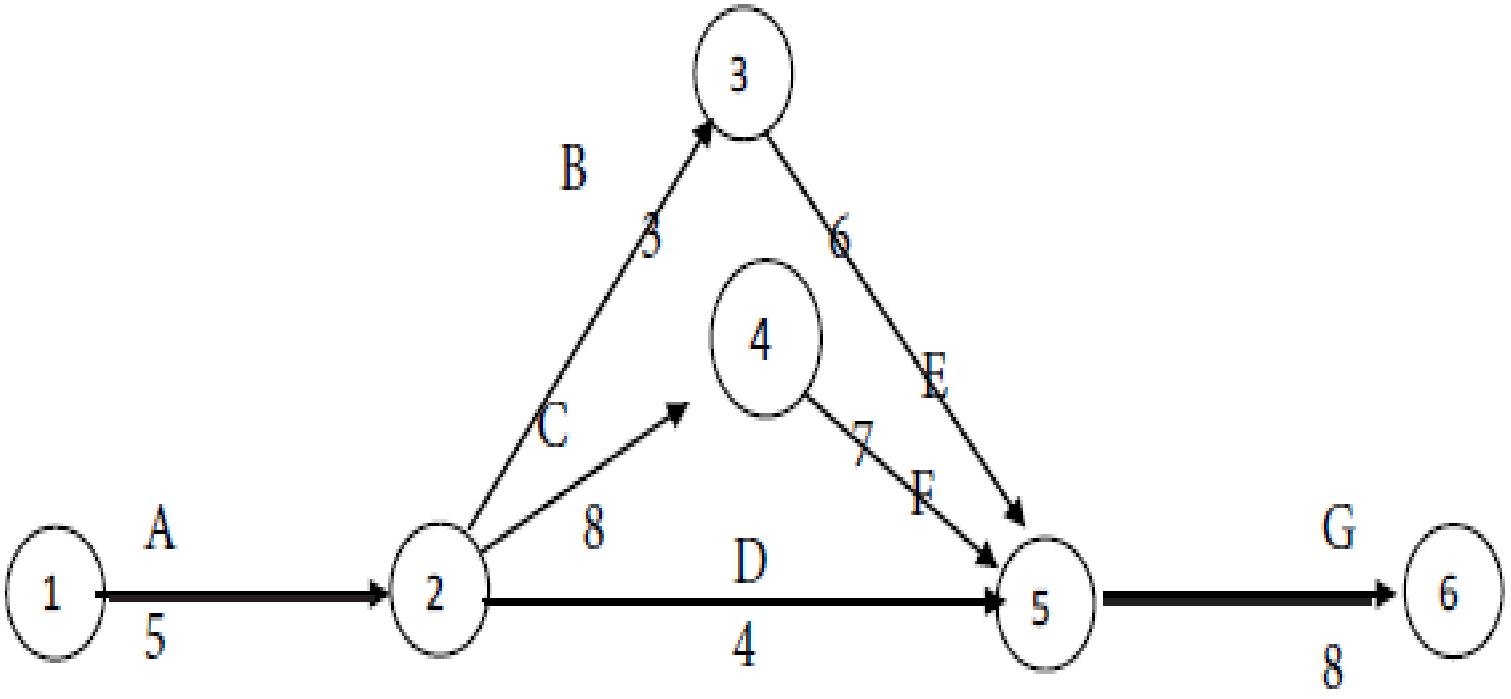
From the three time estimates , and , calculate for each activity.

The results are furnished in the following table:

Activity	Optimistic time estimate (to)	4 x Most likely time estimate	Pessimistic time estimate (tp)	to+ 4tm + tp	Time estimate $t_e = \frac{t_o + 4\,t_m + t_p}{6}$
A	2	20	8	30	5
B	2	12	4	18	3
C	6	32	10	48	8
D	2	16	6	24	4
E	2	24	10	36	6
F	6	28	8	42	7
G	6	32	10	48	8

Network Diagram

With the single time estimates of the activities, the following network diagram is constructed for the project.



Slack of Time for each path

Consider the paths, beginning with the start node and stopping with the end node. There are three such paths for the given project. They are as follows:

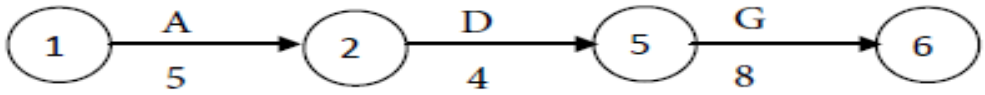
Path I

Time for the path: 5+3+6+8 = 22 weeks.

Path II

Time for the path: 5+8+7+ 8 = 28 weeks.

Path III



Time for the path: 5+4+8 = 17 weeks.

Critical Path

Compare the times for the three paths.

Maximum of {22, 28, 17} = 28.

It is noticed that Path II has the maximum time.

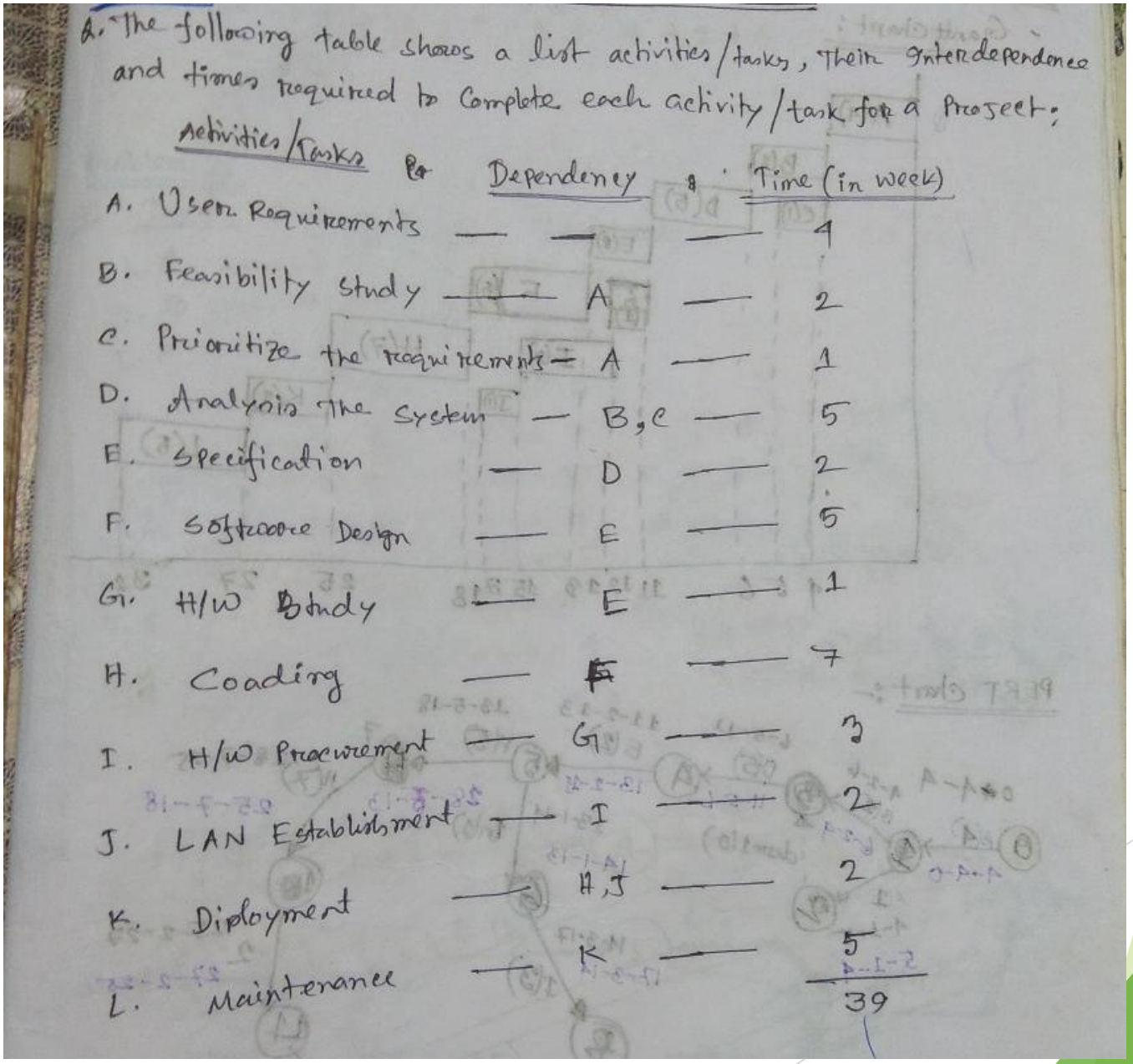
Therefore the critical path is Path II. i.e., $1 \rightarrow 2 \rightarrow 4 \rightarrow 5 \rightarrow 6$.

The critical activities are A, C, F and G.

The non-critical activities are B, D and E.

Project time = 28 weeks.

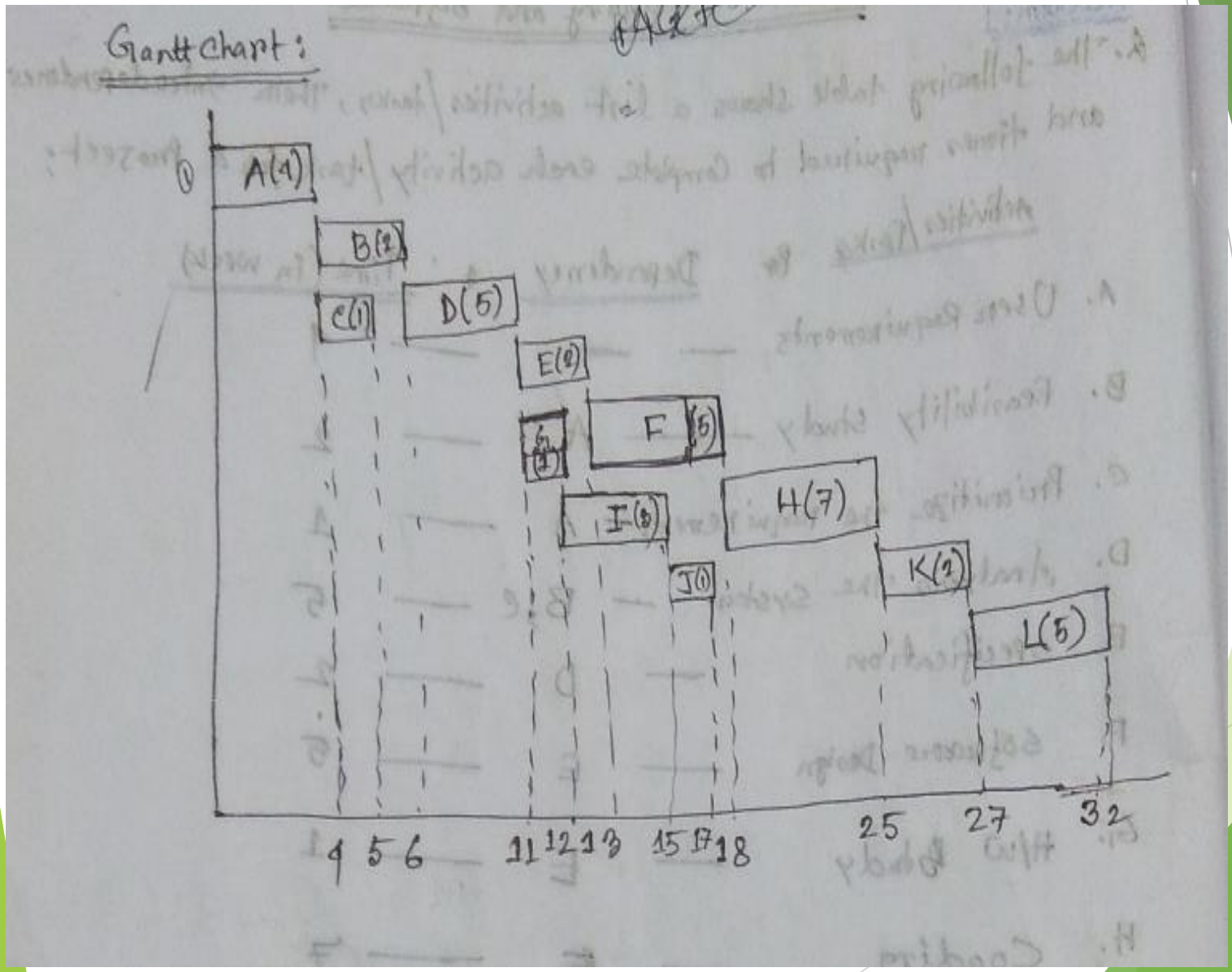
Example-1



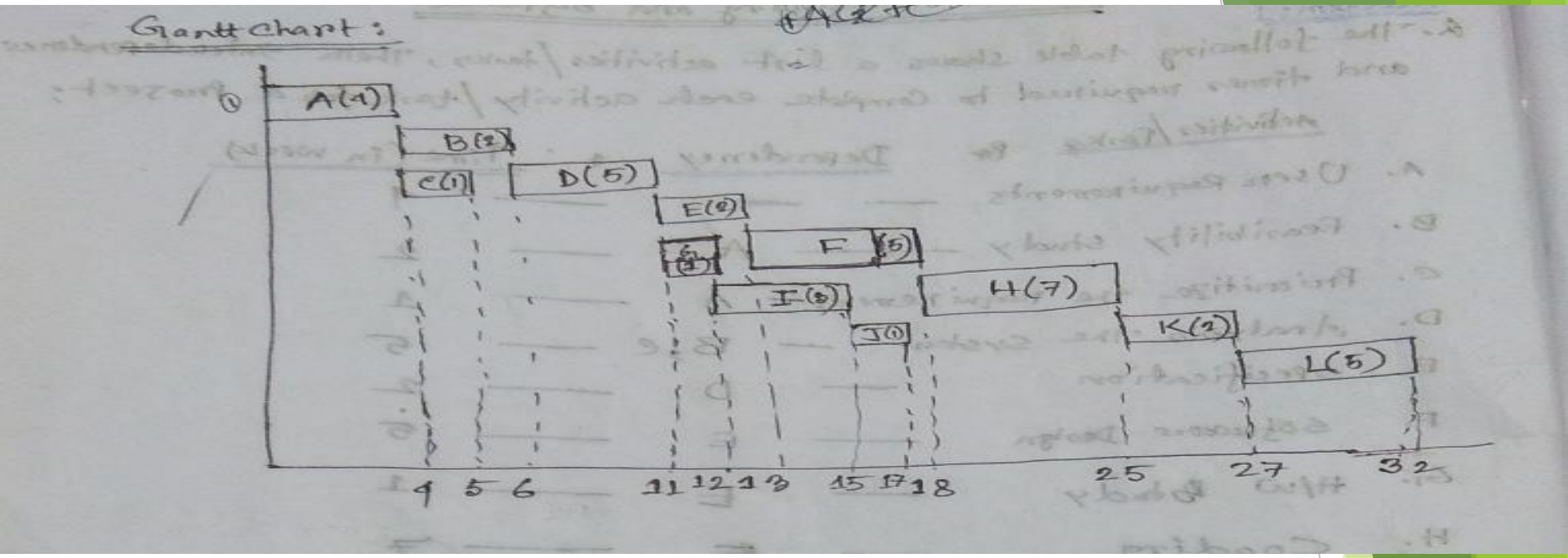
2. The following table shows a list activities/tasks, their interdependence and times required to complete each activity/task for a project:

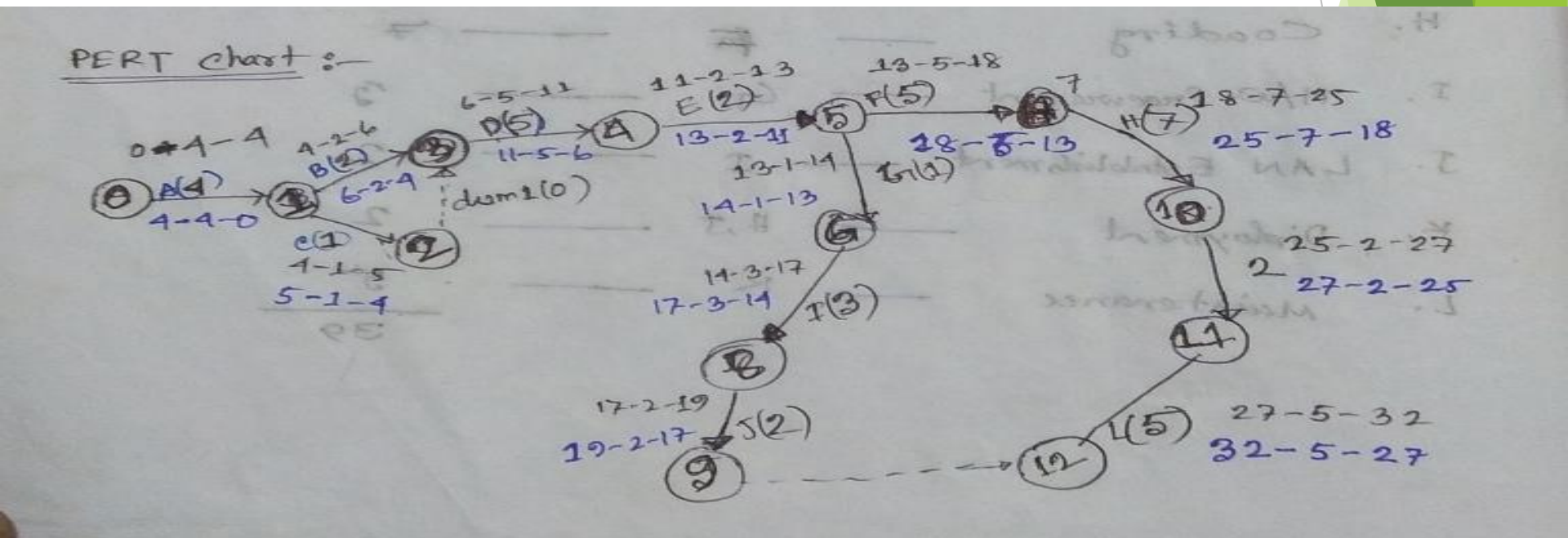
Activities/Tasks	Dependency	Time (in week)
A. User Requirements	—	1
B. Feasibility study	A	2
C. Prioritize the requirements	A	1
D. Analysis the system	B, C	5
E. Specification	D	2
F. Software Design	E	5
G. H/W Study	E	1
H. Coading	~~F~~	7
I. H/W Procurement	G	3
J. LAN Establishment	I	2
K. Diployment	H, J	2
L. Maintenance	K	5
		39

Gantt/Bar Chart

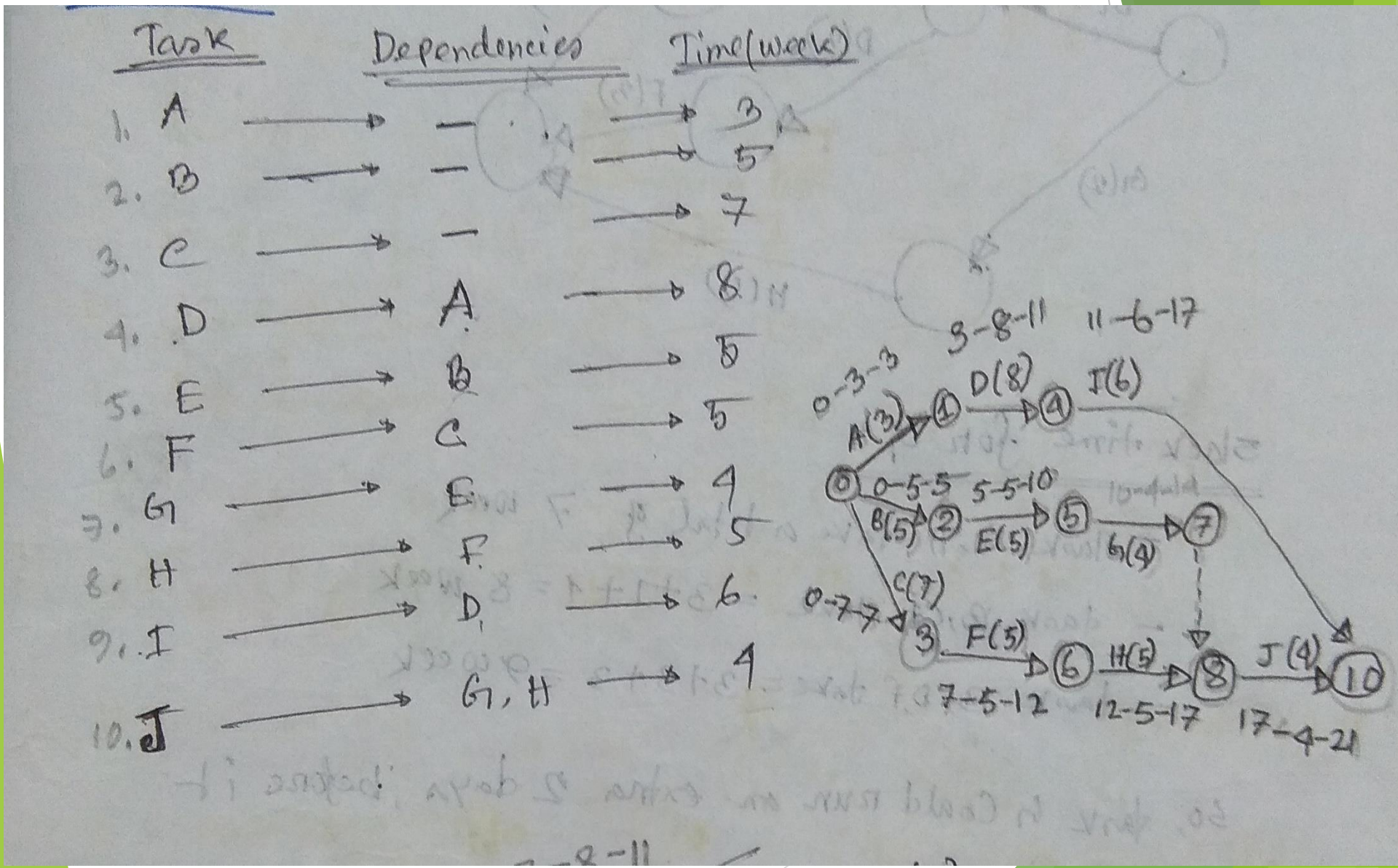


Network Diagram/PERT Chart

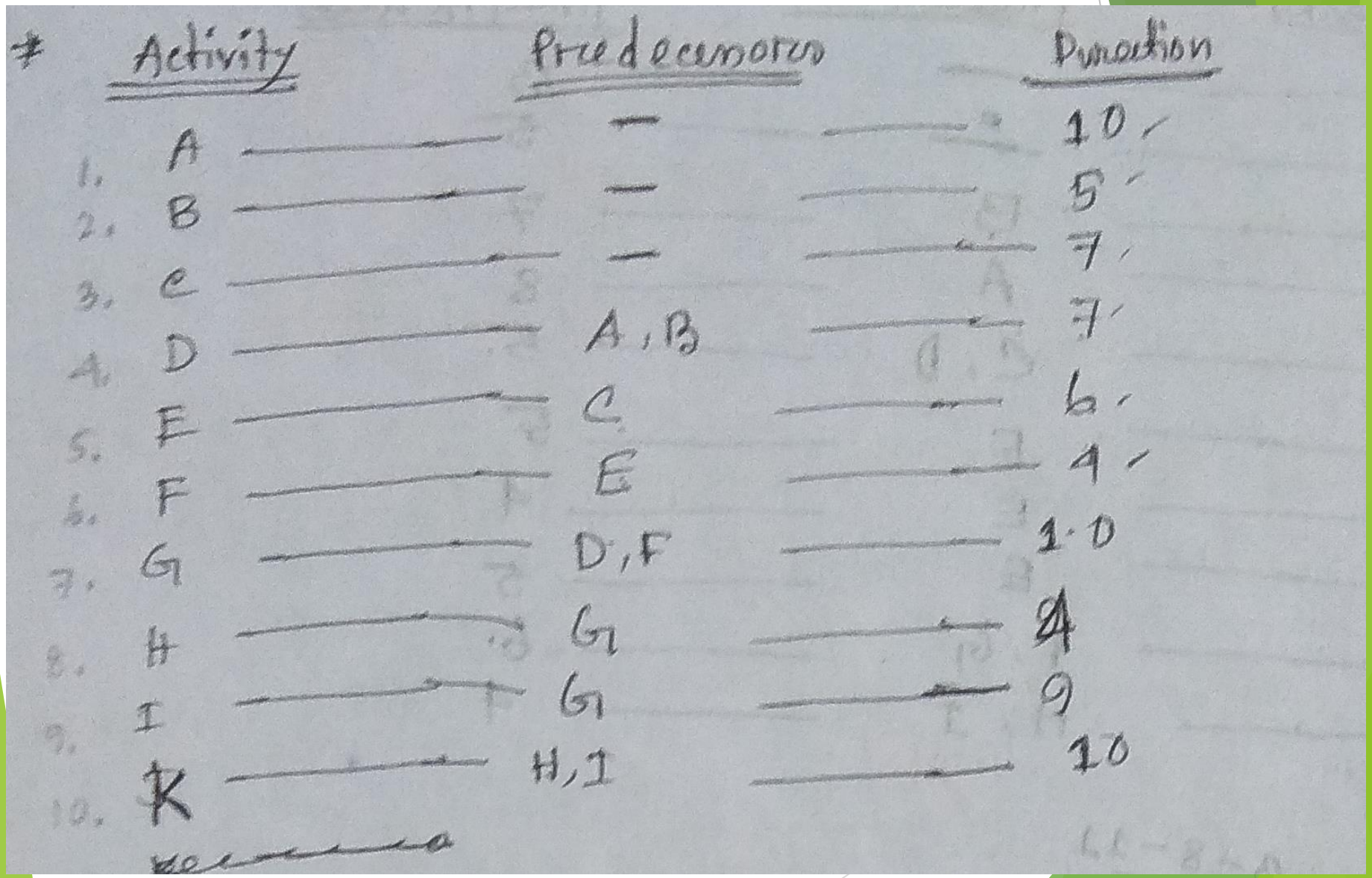




Example-2

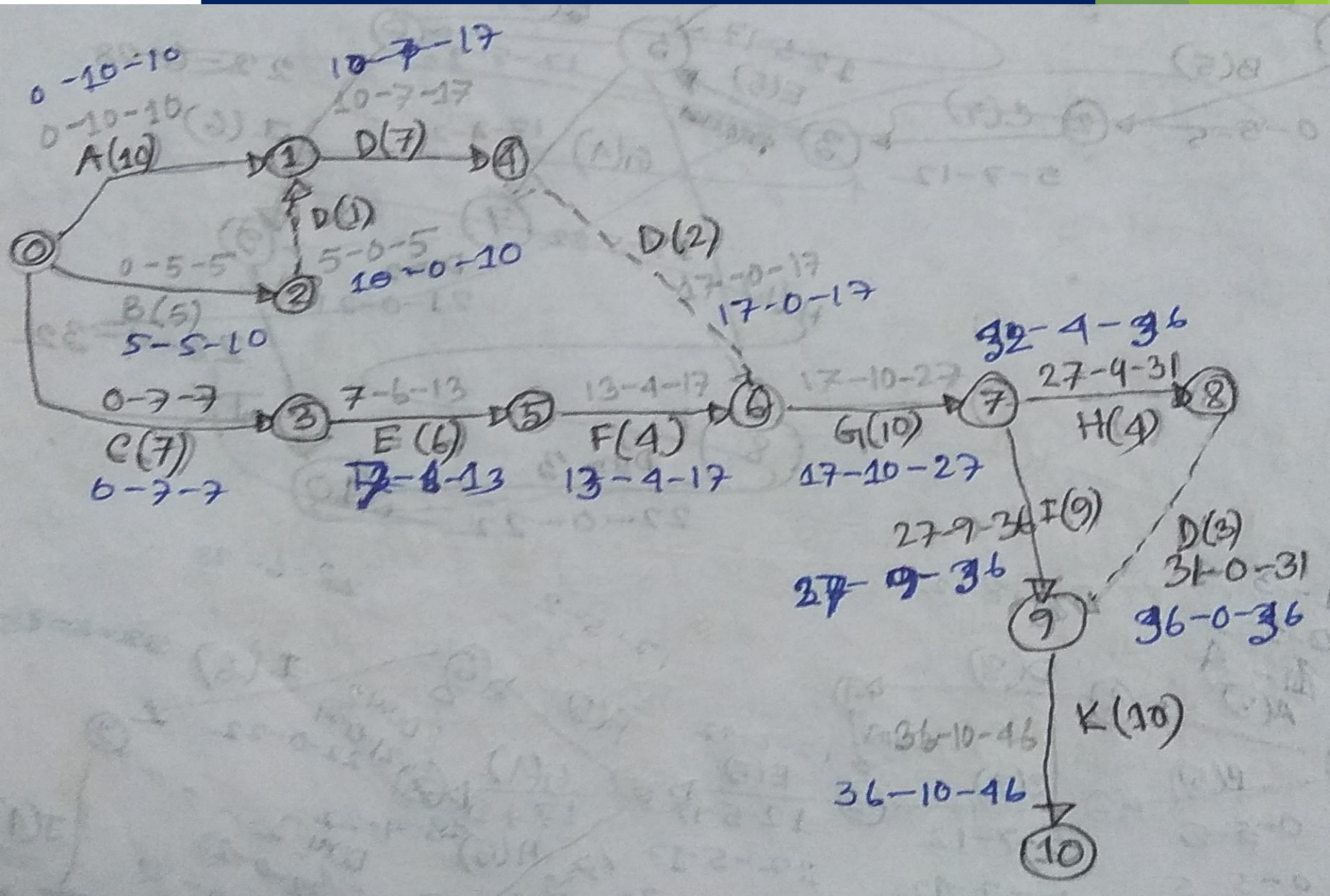

Task
Dependencies
Time(weeks)
1. A — 3
2. B — 5
3. C — 7
4. D A 8
5. E B 5
6. F C 5
7. G E 4
8. H F 5
9. I D 6
10. J G, H 4
0-3-3
A(3)
3-8-11
D(8)
11-6-17
I(6)
0-5-5
B(5)
5-5-10
E(5)
G(4)
0-7-7
C(7)
F(5)
7-5-12
H(5)
12-5-17
J(4)
17-4-21

Example-3



#	Activity	Predecessors	Duration
1.	A	—	10
2.	B	—	5
3.	C	—	7
4.	D	A, B	7
5.	E	C	6
6.	F	E	4
7.	G	D, F	10
8.	H	G	4
9.	I	G	9
10.	K	H, I	10

Network Diagram/PERT Chart



Example-4

Activities / Tasks:	Predecessors	Time (in week)
1. A	—	3
2. B	A	5
3. C	B	7
4. D	A	8
5. E	C, D	5.
6. F	E	5
7. G	E	4
8. H	E	5
9. I	F, G	6.
10. J	H, I	4

Network Diagram/PERT Chart