

Case Study 9 : Critical Path Method (CPM)

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Ques.

Using the information in the Table, assuming that the project team will work a standard working week (5 working days in 1 week) and that all tasks will start as soon as possible:

- (i) Determine the critical path of the project.
- (ii) Calculate the planned duration of the project in weeks.
- (iii) Identify any non-critical tasks.

Task	Description	Duration (Working Days)	Predecessor/s
A	Requirement Analysis	5	
B	Systems Design	15	A
C	Programming	25	B
D	telecoms	15	B
E	Hardware Installation	30	B
F	Integration	10	C, D
G	System Testing	10	E, F
H	Training/Supp ort	5	G
I	Handover and Go-Live	5	H

(i)

Path 1: $A \rightarrow B \rightarrow C \rightarrow F \rightarrow G \rightarrow H \rightarrow I$

Duration: $5 + 15 + 25 + 10 + 10 + 5 + 5 = 75$ days

Path 2: $A \rightarrow B \rightarrow D \rightarrow F \rightarrow G \rightarrow H \rightarrow I$

Duration: $5 + 15 + 15 + 10 + 10 + 5 + 5 = 65$ days

Path 3: $A \rightarrow B \rightarrow E \rightarrow G \rightarrow H \rightarrow I$

Duration: $5 + 15 + 30 + 10 + 5 + 5 = 70$ days

Critical Path:

- $A \rightarrow B \rightarrow C \rightarrow F \rightarrow G \rightarrow H \rightarrow I$ (with **75 days** as the longest duration)

(ii) Total duration of the project (Critical Path) = 75 working days

- 5 working days = 1 week

So, the planned duration in weeks = $\frac{75}{5} = 15$ weeks.

(iii) Non-critical tasks are those that do not lie on the critical path and have slack, meaning their delay will not delay the project completion time.

- **Critical Path Tasks:** A, B, C, F, G, H, I

- **Non-Critical Tasks:**
 - **D (15 days):** Belongs to a shorter path than the critical path.
 - **E (30 days):** Lies on an alternate path but is not part of the longest path.