① Consider the details of a Project as shown in the table :

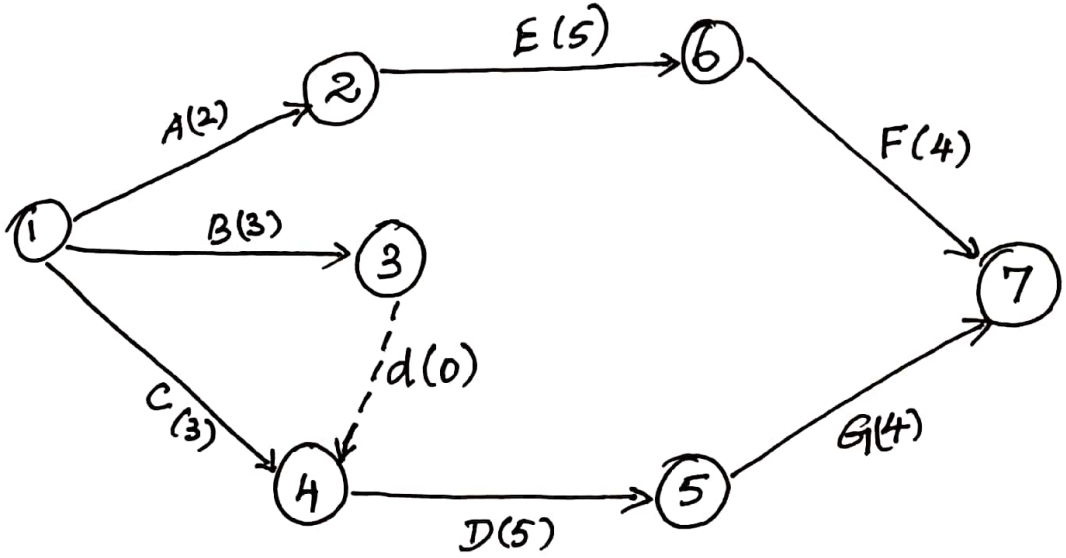
Activity	Immediate Predecessor(s)	Duration (weeks)
A	-	4
B	-	3
C	A, B	2
D	A, B	5
E	B	6
F	C	4
G	D	3
H	F, G	7
I	F, G	4
J	E, H	3

a) Construct the CPM network

b) Determine the Critical path

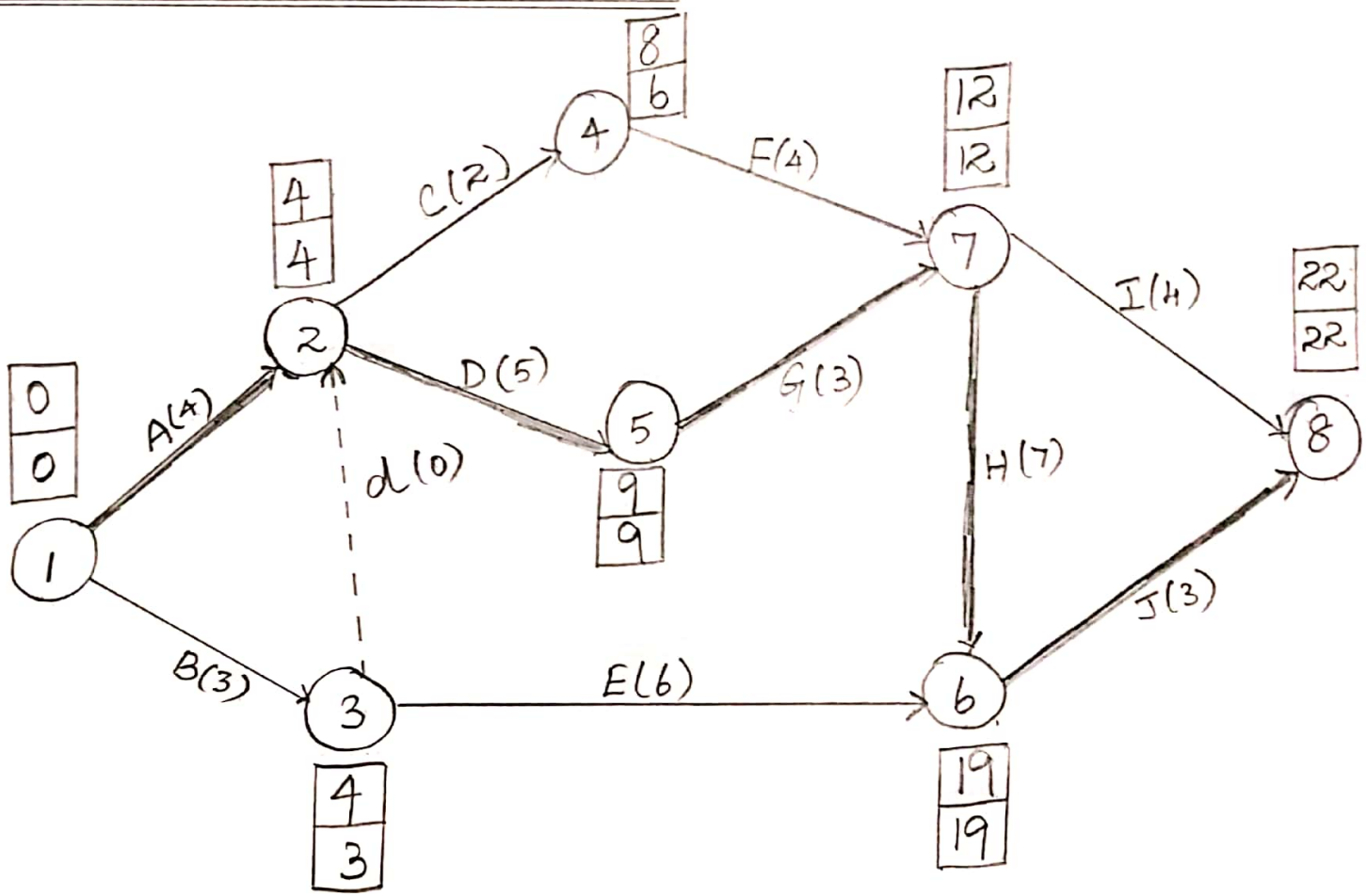
c) Compute total floats and free floats for non-Critical activities.

Sample CPM Network



Dummy activity is an imaginary activity indicating precedence relationship only. Duration of a dummy activity is Zero.

a) Construct the CPM network



→ Latest Completion time $LC_i = \min_j (LC_j - D_{ij})$

→ Earliest Start time $ES_j = \max_i (ES_i + D_{ij})$

Total Floats :

It is the amount of time that the completion time of an activity can be delayed without affecting the project completion time.

$$TF_{ij} = LC_j - ES_i - D_{ij}$$

Free Floats :

It is the amount of time that the activity completion time can be delayed without affecting the earliest start time of immediate successor activities in the network.

$$FF_{ij} = ES_j - ES_i - D_{ij}$$

c) Compute total floats and free floats for non-Critical activities.

Non-Critical activity	Total float $LC_j - ES_i - D_{ij}$	Free float $ES_j - ES_i - D_{ij}$
B	$4 - 0 - 3 = 1$	$3 - 0 - 3 = 0$
C	$8 - 4 - 2 = 2$	$6 - 4 - 2 = 0$
E	$19 - 3 - 6 = 10$	$19 - 3 - 6 = 10$
F	$12 - 6 - 4 = 2$	$12 - 6 - 4 = 2$
I	$22 - 12 - 4 = 6$	$22 - 12 - 4 = 6$