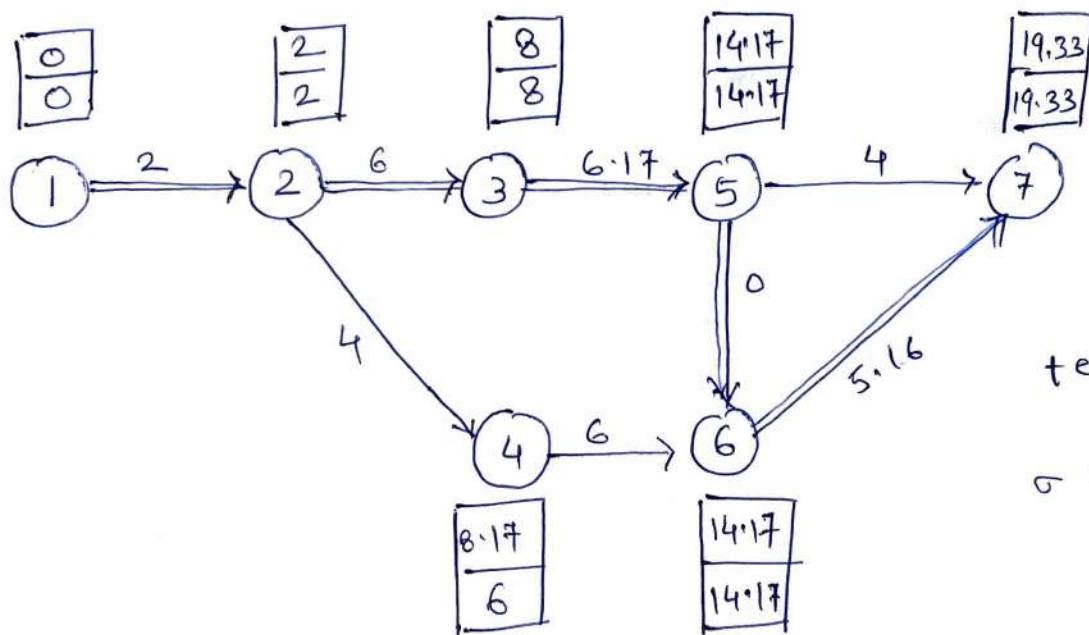


Q. 3 The following tables gives the time estimates of the various activity of a project.

Activity	1-2	2-3	2-4	3-5	4-6	5-6	5-7	6-7
t_o	1	3	2	4	4	0	3	2
t_m	2	6	4	6	6	0	4	5
t_p	3	9	6	9	8	0	5	9

- i) Draw project network & find out total duration
 ii) calculate variance along critical path.



$$t_e = \frac{t_o + 4t_m + t_p}{6}$$

$$\sigma = \frac{t_p - t_o}{6}$$

Activity	t_o	t_p	t_m	$4t_m$	t_e	σ (Deviation)	σ^2 (V)
1-2	1	3	2	8	2	0.33	0.11
2-3	3	9	6	24	6	1	1
2-4	2	6	4	16	4	0.66	0.44
3-5	4	9	6	24	6.17	0.83	0.69
4-6	4	8	6	24	6	0.66	0.44
5-6	0	0	0	0	0	0	0
5-7	3	5	4	16	4	0.33	0.11
6-7	2	9	5	20	5.16	1.16	1.35

Critical path: 1-2-3-5-6-7

$$\text{Total project duration} = 2 + 6 + 6 + 17 + 0 + 5 + 16 \\ = 19.33 \text{ days.}$$

$$\text{Variance along critical path} = 0.11 + 1 + 0.69 + 0 + 1.35 \\ = 3.15$$

Q.4 A small project is composed of 7 activities whose time estimates are listed in the table below. Activities are identified by their beginning (i) and ending (j) node numbers.

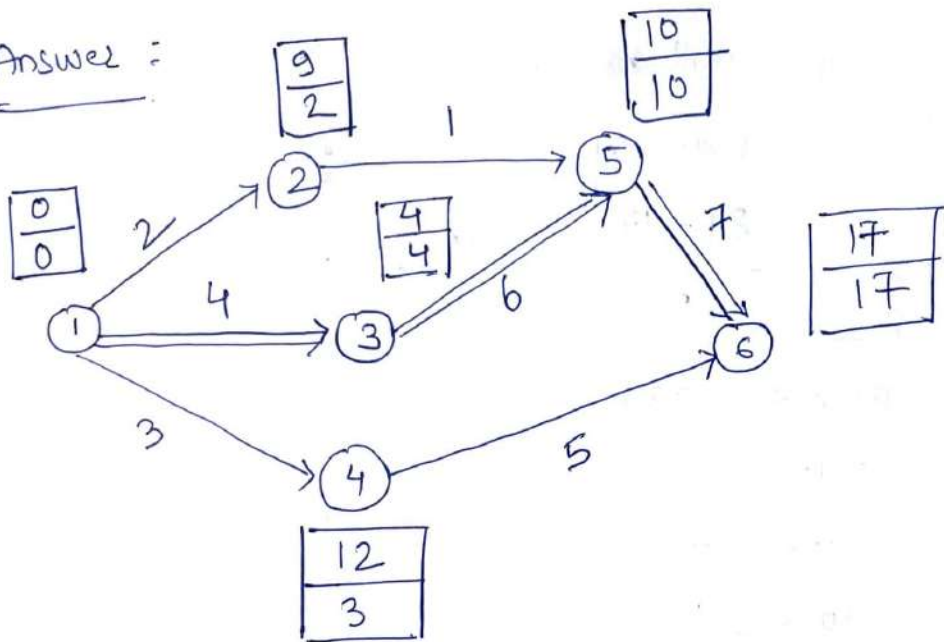
Activity (i-j)	Estimated Duration (weeks)		
	Optimistic	Most likely	Pessimistic
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

- Draw the n/w diagram of activities in the project.
- Find the expected duration and variance for each activity
- calculate the variance and standard deviation of the project length. What is the probability that the project will be completed?
 - at least 4 weeks later than expected time.
 - no more than 4 weeks later than expected time.

d) If the project due date is 19 weeks, what is the probability of not meeting the due date.

Given : Z 0.50 0.67 1.00 1.33 2.00
 Prob 0.3085 0.2514 0.1587 0.0918 0.0228

Answer :



Activity	to	tp	tm	4tm	te	σ (Standard)	σ^2 (Variance)
1-2	1	7	1	4	2	1	1
1-3	1	7	4	16	4	1	1
1-4	2	8	2	8	3	1	1
2-5	1	1	1	4	1	0	0
3-5	2	14	5	20	6	2	4
4-6	2	8	5	20	5	1	1
5-6	3	15	6	24	7	2	4

Critical path : 1-3-5-6

Expected Duration = 4 + 6 + 7
 = 17 weeks

Variance of critical path =
 $1 + 4 + 4 = 9$

Std. deviation of critical path =
 $\sqrt{9} = 3$