Q The data pertains to small project are as follows:

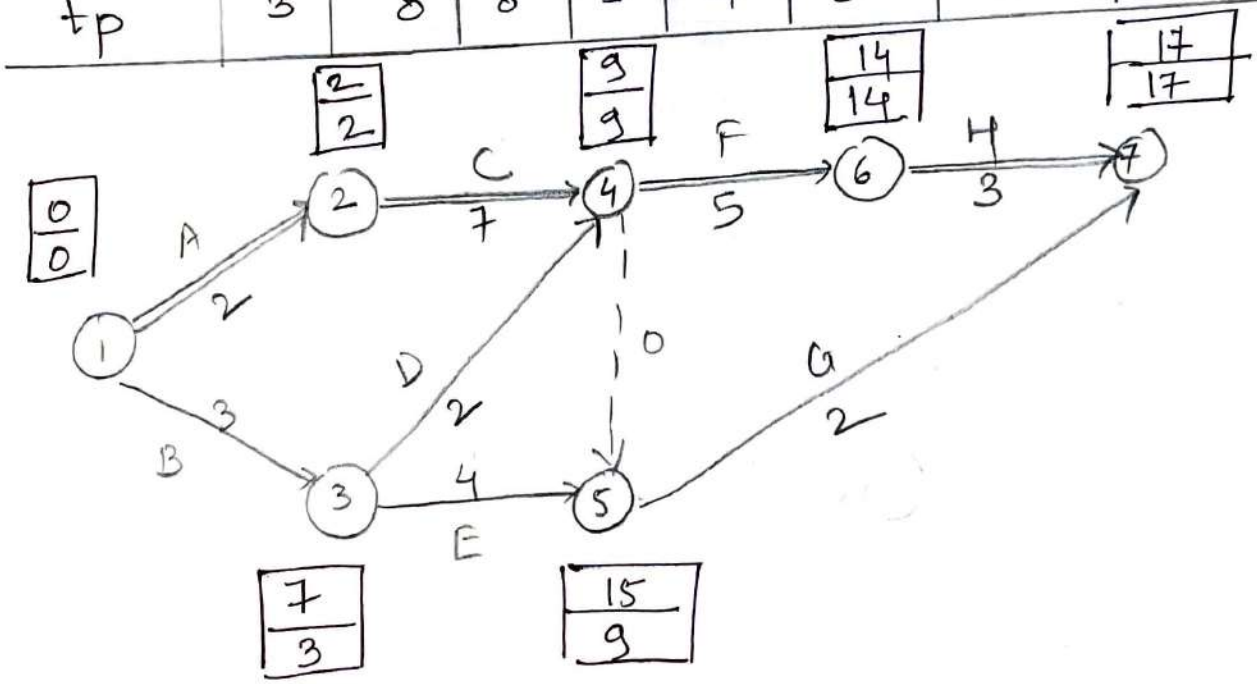
i) Construct the n/w diagram

ii) Find expected duration & variance.

iii) What is the expected project completion time if

* Probability : 93.3 % $z = 1.5$
* Probability : 94.5 % $z = 1.6$
* Probability : 0.8 % $z = -2.4$

Activity	A	B	C	D	E	F	G	H
Predecessors	–	–	A	B	B	C, D	C, D, E	F
to	1	2	6	1	1	1	1	1
tm	2	2	7	2	4	5	2	2
tp	3	8	8	3	7	9	3	9



critical path = 1 – 2 – 4 – 6 – 7

Duration along critical path = 2 + 7 + 5 + 3 = 17 weeks.

variance along critical path = 0.11 + 0.11 + 1.77 + 1.77 = 3.76

∴ Std. deviation = $\sqrt{3.76}$ = 1.939

$$te = \frac{to + 4tm + tp}{6} \qquad \sigma^2 \text{ (variance)} = \left[\frac{tp - to}{6}\right]^2$$

$$\text{Std. deviation } \sigma = \frac{tp - to}{6} \qquad z = \frac{T_S - T_E}{\sigma}$$

Activity	to	tm	tp	4tm	te	σ	σ^2
A	1	2	3	8	2	0.33	0.11
B	2	2	8	8	3	1	1
C	6	7	8	28	7	0.33	0.11
D	1	2	3	8	2	0.33	0.11
E	1	4	7	16	4	1	1
F	1	5	9	20	5	1.33	1.77
G	1	2	3	08	2	0.33	0.11
H	1	2	9	08	3	1.33	1.77

① Expected project duration if Prob = 93.3 & z = 1.5

$$z = \frac{T_S - T_E}{\sigma}$$

$$1.5 = \frac{T_S - 17}{1.939} \quad \therefore T_S = 19.908 \text{ weeks.}$$

② Prob = 94.5 & z = 1.6

$$1.6 = \frac{T_S - 17}{1.939} \quad \therefore T_S = 20.10 \text{ weeks}$$

③ Prob = 0.8 & z = −2.4

$$-2.4 = \frac{T_S - 17}{1.939} \quad \therefore T_S = 12.35 \text{ weeks.}$$