18020348

T.D Jayalath

①

	A	B	C	D
1	18	26	17	⑪
2	⑬	28	14	26
3	38	19	18	⑮
4	19	26	24	⑩

	A	B	C	D
1	7	15	6	⓪
2	⓪	15	①	13
3	23	④	3	0
4	9	16	14	0

	A	B	C	D
1	7	1	5	[0]
2	[0]	1	0	13
3	23	[0]	②mm	0
4	9	12	13	0

No. of rows/columns = 4
No. of squared zeros = 3
∴ Not optimal

18020348
T·D Jayalath

	A	B	C	D
1	5	11	③ mm	⓪
2	⓪	13	0	15
3	21	⓪	0	0
4	7	12	11	0

No. of rows/columns = 4

No. of squared zeroes = 3

∴ Not optimal.

	A	B	C	D
1	2	8	⓪	0
2	⓪	13	0	18
3	21	⓪	0	3
4	4	9	8	⓪

No. of rows/columns = 4

No. of squared zeroes = 4

∴ Optimal.

ADMs	Factories	Time
1	C	17
2	A	13
3	B	19
4	D	10
		59

$Mm \; z = 59$

$\therefore$ Total mm tme = 59 mms

② Arrival rate $= \lambda = \dfrac{6}{60} = 0.1$ м

Service rate $= \mu = \dfrac{1}{4} = 0.25$

ⓐ (i) $\rho = \dfrac{\lambda}{\mu} = \dfrac{0.1}{0.25} = \underline{\underline{0.4}}$

(ii) $Ls = \dfrac{\lambda}{(\mu-\lambda)} = \dfrac{0.1}{(0.25-0.1)} = 0.66 \approx \underline{\underline{1}}$

(iii) $Lq = \dfrac{\lambda^2}{\mu(\mu-\lambda)} = \dfrac{(0.1)^2}{0.25(0.25-0.1)} = \dfrac{0.01}{0.0375}$

$= \underline{\underline{0.26 \approx 0}}$

(iv) $Ws = \dfrac{1}{(\mu-\lambda)} = \dfrac{1}{(0.25-0.1)} = \underline{\underline{6.66}}$

(v) $Wq = \dfrac{\lambda}{\mu(\mu-\lambda)} = \dfrac{0.1}{0.25(0.25-0.1)} = \dfrac{0.1}{0.0375}$

$= \underline{\underline{2.66}}$

18020348
T.D. Jayalath

b) $P(N=0) = 1 - P = 1 - 0.4 = \underline{\underline{0.6}}$

c) $1 - 0.6 = \underline{\underline{0.4}}$

d) $P(N \geqslant 4) = P^4 = 0.4^4 = \underline{\underline{0.0256}}$