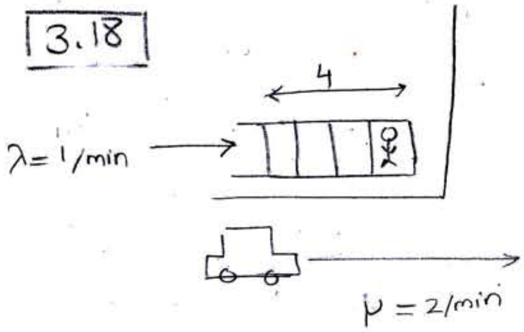
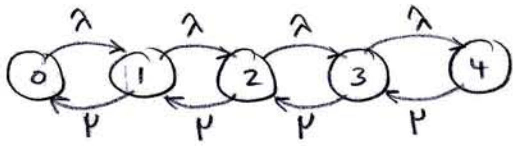
$\boxed{3.18}$



The problem can be modeled by :



$\rho = \frac{\lambda}{\mu} = \frac{1}{2}$

$P_i = P_0 \, \rho^i \qquad i = 0, 1, \cdots, 4$ (where P_i is the probability of i persons waiting for a taxi)

$\sum_{i=0}^{4} P_i = 1 \quad \Rightarrow \quad P_0\left(1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16}\right) = 1 \qquad \Rightarrow P_0 = \frac{16}{31}$

$\therefore \; P_i = \frac{16}{31}\left(\frac{1}{2}\right)^i \qquad i = 0, 1, \cdots, 4$

Average number of persons waiting $= N = \sum_{i=1}^{4} i \, p^i$

$$N = \frac{16}{31}\left[1 \times \frac{1}{2} + 2 \times \frac{1}{4} + 3 \times \frac{1}{8} + 4 \times \frac{1}{16}\right]$$

$$= \frac{16}{31} \times \frac{(8+8+6+4)}{16}$$

$$= \frac{26}{31}$$

$$\boxed{N = \frac{26}{31}}$$

λ_q = rate of passengers that join the queue

$= \lambda \times (1 - P_4) = 1 \times \frac{30}{31}$

Little's thm : $T = \frac{N}{\lambda_q} = \frac{26/31}{30/31} = \frac{13}{15}$