Section - 6

Q.12

(a) average speed $= \dfrac{N_1 t_1 + N_2 t_2 + \cdots}{t_1 + t_2 + \cdots}$

$= \dfrac{720 \times 0.3 + 1440 \times 0.4 + 900 \times 0.3}{0.3 + 0.4 + 0.3}$

$= \dfrac{1062}{1}$

$= 1062$ rpm

$$W = \left(\frac{720 \times (3000)^3 + 1440 \times (7000)^3 + 900 \times (5000)^3}{720 + 1440 + 900} \right)^{1/3}$$

$$= (2.05 \times 10^{11})^{1/3}$$

$$= 5900.1 \text{ N}$$

$$L = \left(\frac{C}{W} \right)^k \times 10^6$$

$$= \left(\frac{16600}{5900.1} \right)^3 \times 10^6$$

$$\boxed{L = 22.271 \times 10^6 \text{ rev}}$$