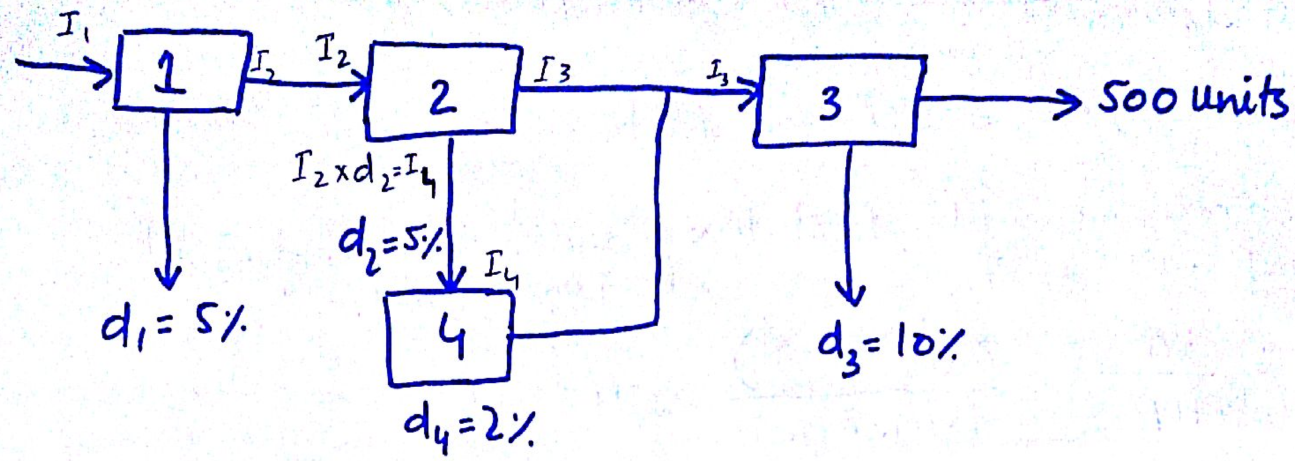
Q NO 2.17



Solutions:

First we will find all inputs

$I_3 = O_2 + O_4$ ——— (i)

$I_4 = I_2 \times d_2$ ——— (ii) from diagram

$$I_4 = \frac{O_4}{1-d_4}$$

$I_4 \times (1-d_4) = O_4$ ——— (iii)

Put the value of I_4 in (ii).

$I_2 d_2 \times (1-d_4) = O_4$ ——— (iv)

Putting (iv) in (i).

$$I_3 = I_2(1-d_2) + I_2 d_2 (1-d_4)$$

$$I_3 = I_2 (1-d_2) + d_2 (1-d_4)$$

$$I_2 = \frac{I_3}{(I-d_2) \quad + d_2(1-d_4)}$$

Putting values we get.

$I_2 = 5561.11$ units.

$$I_1 = \frac{O_1}{1-d_1} = \frac{5561.11}{1-0.05} = 5853.8 \text{ units.}$$

$$I_4 = I_2 \times d_2 = 278.05 \text{ units.}$$

Now we will find the machines required. Took values of S, E, H, R from question.

$$F_1 = \frac{S\Phi}{EHR} = \frac{3(5853.8)}{1 \times 4800 \times 0.95} \approx 4.$$

$$F_2 = \frac{S\Phi}{EHR} = \frac{2 \times (5561.11)}{0.95 \times 4800 \times 0.90} = 2.56 \approx 3$$

$$F_3 = \frac{S\Phi}{EHR} = \frac{5 \times (5555.55)}{1.02 \times 4800 \times 0.90} \approx 6$$

$$F_4 = \frac{S\Phi}{EHR} = \frac{10 \times 278.05}{0.90 \times 2400 \times 0.95} = 1.35 \approx 1$$