— Contd.

Substituting ② in ③

$$X_2 = \left(\frac{G_1 G_2}{1 + G_2 F}\right) X$$

$$\therefore X = \left(\frac{1 + G_2 F}{G_1 G_2}\right) X_2 \longrightarrow ⑥$$

Substituting equation ⑥ and ④ in Equation ①

$$X = R - X_3$$

$$\Rightarrow \left(\frac{1 + G_2 F}{G_1 G_2}\right) X_2 = R - kX_2$$

$$\Rightarrow X_2 \left[\frac{1 + G_2 F}{G_1 G_2} + k\right] = R$$

$$\Rightarrow X_2 \left(\frac{1 + G_2 F + k G_1 G_2}{G_1 G_2}\right) = R$$

$$\Rightarrow X_2 = \frac{G_1 G_2 R}{1 + G_2 F + k G_1 G_2}$$

Substituting for X_2 in Equation ⑤

→ P.T.O