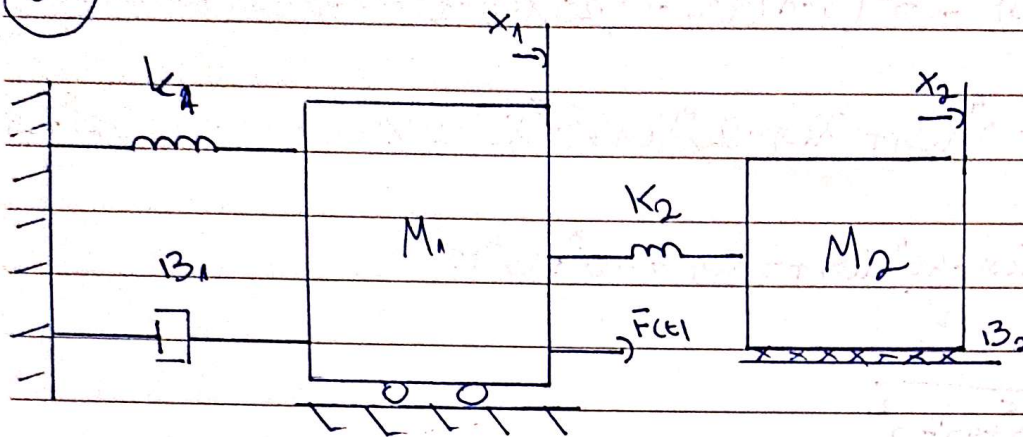


Skr. 12.

(5.)



$$M_1 = 2 \text{ kg}$$

$$M_2 = 1 \text{ kg}$$

$$k_1 = 3 \text{ N/m}$$

$$k_2 = 4 \text{ N/m}$$

$$B_1 = 2 \text{ Ns/m}$$

$$B_2 = 2 \text{ Ns/m}$$

$$F(t) = 2 \sin t$$

$$-M_1 x_1'' - B_1 x_1' - k_1 x_1 + F(t) + k_2 (x_2 - x_1) = 0$$

$$-M_2 x_2'' - B_2 x_2' - k_2 (x_2 - x_1) = 0$$

$$M_1 x_1'' + B_1 x_1' + k_1 x_1 = F(t) + k_2 (x_2 - x_1) \quad | : M_1$$

$$M_2 x_2'' + B_2 x_2' + k_2 (x_2 - x_1) = 0 \quad | : M_2$$

$$x_1'' + \frac{B_1}{M_1} x_1' + \frac{k_1}{M_1} x_1 = \frac{F(t)}{M_1} + \frac{k_2}{M_1} (x_2 - x_1)$$

$$x_2'' + \frac{B_2}{M_2} x_2' + \frac{k_2}{M_2} (x_2 - x_1) = 0$$

~~Equation~~

$$x_1'' + x_1' + \frac{3}{2} x_1 = \sin t + 2(x_2 - x_1)$$

$$x_2'' + 2x_2' + 4(x_2 - x_1) = 0$$

$$x_1'' = \sin t + 2(x_2 - x_1) - x_1' - \frac{3}{2} x_1$$

$$x_2'' = -2x_2' - 4(x_2 - x_1)$$

$$s^2 X_1(s) = \frac{1}{s^2 + 1} + 2X_2(s) - 2X_1(s) - sX_1(s) - \frac{3}{2} X_1(s)$$

$$s^2 X_2(s) = -2sX_2(s) - 4X_2(s) + 4X_1(s)$$

$$s^2 X_1(s) + 5X_1(s) + 2X_1(s) + \frac{3}{2}X_1(s) - 2X_2(s) = \frac{1}{s^2+1}$$

$$-4X_1(s) + s^2 X_2(s) + 25X_2(s) + 4X_2(s) = 0$$

$$X_1(s) \left(s^2 + s + \frac{7}{2} \right) - 2X_2(s) = \frac{1}{s^2+1}$$

$$-4X_1(s) + X_2(s) (s^2 + 25 + 4) = 0$$

$$D = \begin{vmatrix} s^2 + s + \frac{7}{2} & -2 \\ -4 & s^2 + 25 + 4 \end{vmatrix} = \left(s^2 + s + \frac{7}{2} \right) (s^2 + 25 + 4) - 8$$

$$= s^4 + 2s^3 + 4s^2 + s^3 + 25s^2 + 4s + \frac{7s^2}{2} + 7s + 14 - 8$$

$$= s^4 + 3s^3 + \frac{19}{2}s^2 + 11s + 6$$

$$= 2s^4 + 6s^3 + 19s^2 + 22s + 12$$

$$\cancel{D_1 = \begin{vmatrix} \frac{1}{s^2+1} & -2 \\ 0 & s^2 + 25 + 4 \end{vmatrix} = \frac{s^2 + 25 + 4}{s^2 + 1}}$$

$$D_1 = \begin{vmatrix} \frac{1}{s^2+1} & -2 \\ 0 & s^2 + 25 + 4 \end{vmatrix} = \frac{s^2 + 25 + 4}{s^2 + 1}$$

$$D_2 = \begin{vmatrix} s^2 + 9 + \frac{7}{2} & \frac{1}{s^2 + 1} \\ -4 & 0 \end{vmatrix} = \frac{4}{s^2 + 1}$$

$$X_1 = \frac{D_1}{D} = \frac{s^2 + 2s + 4}{(s^2 + 1)(2s^4 + 6s^3 + 19s^2 + 22s + 12)}$$

$$X_2 = \frac{D_2}{D} = \frac{4}{(s^2 + 1)(2s^4 + 6s^3 + 19s^2 + 22s + 12)}$$