

(4)

2(b)

$$A(5) = \frac{40(105) + 2000}{110} = \frac{6200}{110} \approx$$

2

2(c) At overflow $t = 25$ and $V = 150$

$$\therefore \sigma = \frac{A(25)}{150} = \frac{8 \cdot 25 \cdot (100 + 25) + 2000}{150 \cdot 150}$$

$$= \frac{200(125) + 2000}{22500} \approx 1.2 \text{ Kg/L}$$

3

(20)

3.

$$y'' - 4y' + 4y = 4x + 5\cos x, \quad y(0) = 1, \quad y'(0) = -1$$

$$\lambda^2 - 4\lambda + 4 = (\lambda - 2)^2 = 0 \Rightarrow \lambda = 2, 2$$

1

$$\therefore y_c \equiv y_h = e^{2x}(C_1 x + C_2)$$

2

$$\text{Now } y_p = Ax + B + C\cos x + D\sin x$$

$$y_p' = A - C\sin x + D\cos x$$

$$y_p'' = -C\cos x - D\sin x$$

2

Sub into d.e. \Rightarrow

$$-C\cos x - D\sin x - 4Ax + 4A + 4C\sin x - 4D\cos x$$

$$+ 4Ax + 4B + 4C\cos x + 4D\sin x = 4x + 5\cos x$$

1