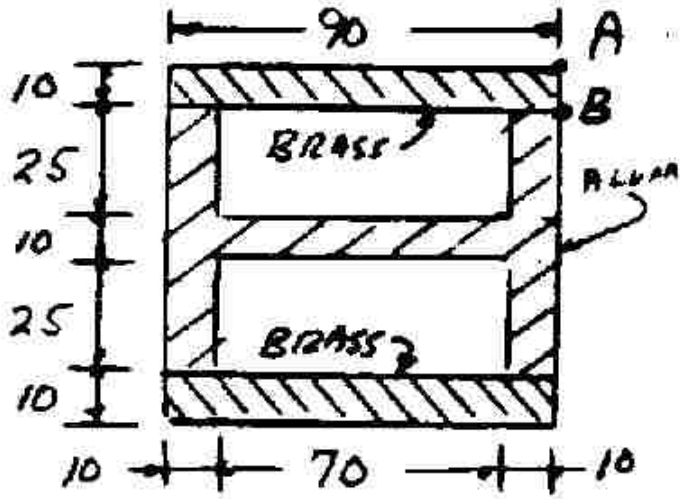
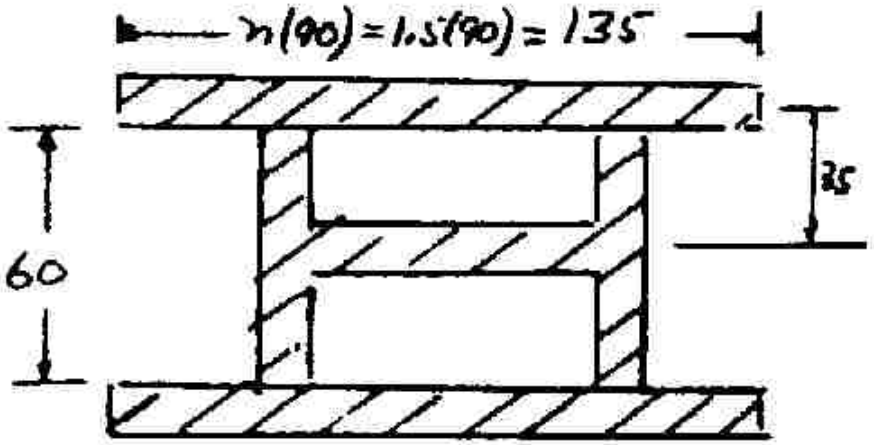
4.206

$$n = \frac{E_b}{E_a} = \frac{105\ MPa}{70\ MPa} = 1.5$$

DIMENSIONS IN mm





TRANSFORMED SECTION (ALL ALU

$$I_x = 2\left[\frac{1}{12}(135)(10)^3 + (135\times10)(35)^2\right] + 2\left[\frac{1}{12}(10)(60)^3\right] + \frac{1}{12}(70)(10)^3$$

$$= 3.6958\times10^{-6}\ m^4 \qquad I_x = 3.6958\times10^{-6}\ m^4$$

For $\sigma_{all} = 160\ MPa$ in BRASS. AT POINT A: $y_A = 40\ mm$

$$\sigma_A = n\frac{My_A}{I_x}; \quad 160\ MPa = 1.5\ \frac{M(0.040\ m)}{3.6958\times10^{-6}\ m^4}$$

$$M = 9856\ N\cdot m \qquad M = 9.86\ kN\cdot m$$

For $\sigma_{all} = 100\ MPa$ in ALUMINUM. AT POINT B: $y_B = 30\ mm$

$$\sigma_B = \frac{My_B}{I_x}; \quad 100\ MPa = \frac{M(0.030\ m)}{3.6958\times10^{-6}\ m^4}$$

$$M = 12319\ N\cdot m \qquad M = 12.32\ kN\cdot m$$

WE CHOOSE THE SMALLER VALUE: $M = 9.86\ kN\cdot m$