

Ichen Morgan Mech Exam
(2014/08)

1)

A)

$$\frac{5WL^4}{384EI} = I = \frac{5WL^4}{384EA}$$

$$= \frac{5 \times 10000 \times 5^4}{384 \times 200 \times 10^9 \times 0.005}$$
$$= \frac{31,250,000}{384 \times 10^9} = 8.14 \times 10^{-5}$$

B)

$$\frac{bd^3 - b^3d}{12}$$

$$b = 0.15$$

$$d = 0.25$$

$$h = 0.1$$

$$T = 0.005$$

$$= \frac{0.15 \times 0.25^3 - 0.1^3 (0.15 - 0.005)}{12}$$

$$= 1.83 \times 10^{-4} \text{ (Beam not sufficient)}$$

$$b = 0.5$$

$$d = 0.5$$

$$h = 0.25$$

$$t = 0.1$$

$$= \frac{0.5 \times 0.5^3 - 0.25^3 (0.5 - 0.1)}{12}$$

$$> 4.6 \times 10^{-3} \text{ (Beam not sufficient)}$$

$$b = 0.5$$

$$d = 0.5$$

$$h = 0.25$$

$$t = 0.5$$

$$= \frac{0.5 \times 0.5^3 - 0.25^3 (0.5 - 0.5)}{12}$$

$$= 5.2 \times 10^{-3} \text{ (Beam sufficient)}$$