Q2.

Ans Given $B = 1.6\ T$

Find: Force Per unit area, F_e/A (Force density)

(1) The mechanical force due to field is

$$F_e = -\frac{\partial W_f(B, x)}{\partial x}$$

$$= -\frac{1}{2}\frac{B^2 A}{\mu}$$

(2) The force Per unit area is!

$$\frac{F_e}{A} = \frac{1}{2}\frac{B^2}{\mu}$$

$$= \frac{1}{2} \times \frac{(1.6)^2}{4\pi \times 10^{-7}}$$

$$= \frac{1}{2} \times \frac{2.56}{4 \times 3.14 \times 10^{-7}}$$

$$= \frac{2.56}{2(12.56 \times 10^{-7})}$$

$$= \boxed{1.02 \times 10^{6}\ N/m^2}$$