

Assgt 4.

1. $F = Bli$

$l = 18 \text{ cm}$

$i = 25 \text{ A}$

$B = 1 \text{ T}$

$F = 1 \times 0.18 \times 25 = \underline{4.5 \text{ N}}$

20

2. $p = 3$

$Z = 456$

$V_{in} = \frac{2pZ}{C} \text{ mV}$

One conductor

$V_{in} = 2p n \phi = 1$

(a) LAP. $C = 2p$

$V_{in} = \frac{2pZ}{C} n \phi = \frac{Z}{2p} (2p n \phi) = \frac{456}{2 \times 3} \times 1 = \underline{76 \text{ V}}$ 15

(b) wave $C = 2$

$V_{in} = \frac{2pZ}{C} n \phi = \frac{Z}{2} (2p n \phi) = \frac{456}{2} \times 1 = \underline{228 \text{ V}}$ 15

3. $p = 1, Z = 260, l = 16 \text{ cm}, r = 12 \text{ cm}, B = 0.8 \text{ T}$
 $I_a = 60 \text{ A}, I_{\text{cond}} = 60/2 = 30 \text{ A}.$ ~~20~~

(a) $F = Bli = 0.8 \times (0.16 \times 260) \times 30 \times \frac{70}{100} = \underline{698.9 \text{ N}}$ 20

(b) $P = 2\pi n T = 2\pi \cdot \frac{1600}{60} \times 698.9 \times 0.12 = \underline{14051 \text{ W}}$ 15

(c) $P = V_{in} I_a \rightarrow V_{in} = \frac{P}{I_a} = \frac{14051}{30} = \underline{234.2 \text{ V}}$ 15