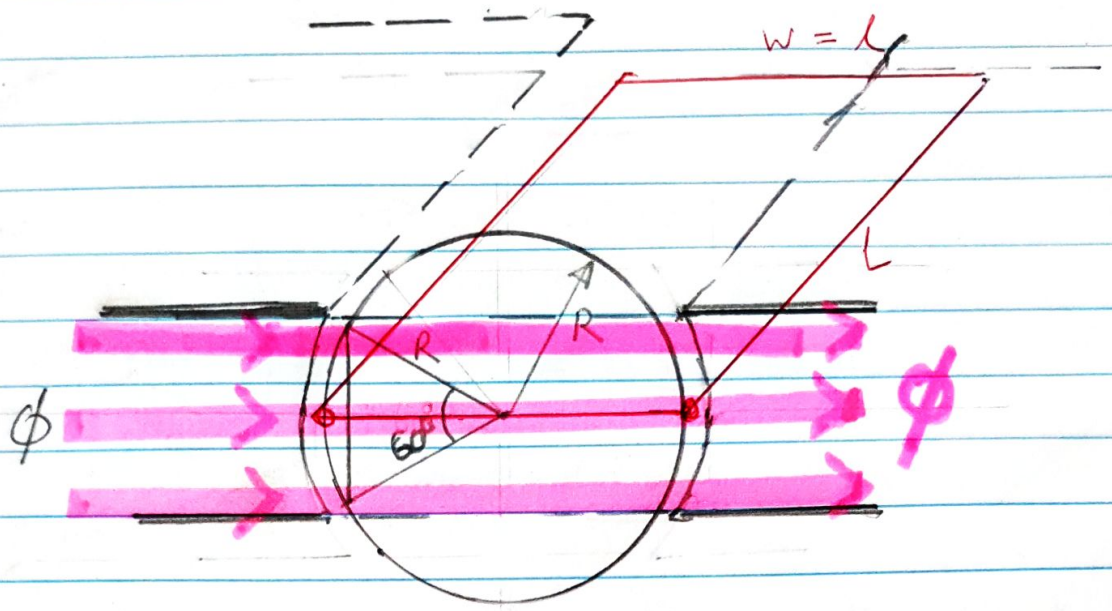
ASSIGNMENT 6



Length, l = width, w = $2R$

1

i) $u = 2\pi R n$ = 18.85 m/s

ii) $R = l/2$

$A = Rl = \frac{1}{2} l^2$ = 200 cm²

iii) $\phi = BA$ = 20 mW

iv) $e_{Cond} = Blu$ = 3.8 V

v) $e_{Coil} = 2N e_{Cond} = 2NBlu = 4\pi NRnB$

= 377 V

vi) $f = pn$ = 30.0 Hz

vii) $f = pn$ = 30.0 Hz.

2 $n = f/p$; n doubles

i) $2p \rightarrow$ halves

ii) $p \rightarrow$ halves

iii) $f \rightarrow$ double

iv) $f \rightarrow$ doubles

v) $Z = 2N \rightarrow$ remains the same

3

i) $E_{av} = \frac{2pZ}{c} n\phi$, $c = 2p$

$E_{av} = Zn\phi = 148.8\ V$

ii) $\bar{T} = \frac{1}{2\pi}\left(\frac{2p\bar{E}}{c}\right)\phi\bar{I}_a = \frac{1}{2\pi} Z\phi\bar{I}_a$

$\bar{I}_a = \frac{2\pi\bar{T}}{Z\phi} = 31.7\ A$

(iii) $k_d = \frac{\text{Chord}}{\text{Arc}} = \frac{D}{\pi D/2} = \frac{2}{\pi} = 0.64$

iv) $E_{rms} = 2.22 Z_s f \phi k_d = 2.22 Z_s n_p \phi k_d$

$= 105.1\ V$