

Q1/ $r_2 = 0.08 \text{ m}$
 $r_1 = 0.03 \text{ m}$
 $N = 1500 \text{ RPM}$
 $\mu = 0.28$
 $P = 1620$
 $\Rightarrow T = 10.31 \text{ Nm.}$

$$W_{cp} = 626.54 \text{ N}$$

$$W_{cw} = 669.69 \text{ N}$$

Q2/ $r_2 = 0.055$
 $r_1 = 0.01$
 $\mu = 0.38$
 $W = 638 \text{ N}$

$$T_{cp} = 9.838 \text{ Nm}$$

$$T_{cw} = 7.88 \text{ Nm}$$

Q3/ $n = 4$
 $N = 4250 \text{ RPM}$
 $r_2 = 0.095$
 $r_1 = 0.025$
 $\mu = 0.32$
 $W = 510 \text{ N.}$

$$T_{cp} = 87.22 \text{ Nm}$$

$$P_{cp} = 38.8 \text{ kW}$$

$$T_{cw} = 78.336 \text{ Nm}$$

$$T_{cp} = 34.86 \text{ kW.}$$

Q4/ $P = 56000 \text{ W}$
 $N = 3600 \text{ RPM}$
 $\mu = 0.31$
 $r_2 = 0.081$
 $r_1 = 0.026$
 $W = 1100 \text{ N.}$

$$n_{cp} = 3.74 \therefore 4 \text{ plates.}$$

$$n_{cw} = 4.07 \therefore 5 \text{ plates}$$

Q5/ $D = 0.1 \text{ m}$
 $P = 0.86 \text{ kW} \rightarrow 860 \text{ W}$
 $N = 500 \text{ RPM}$

$$T_{max} = 800 \text{ N} \rightarrow F_1$$

$$\omega = 2.618 \text{ rad/s}$$

$$P = r(F_1 - F_2)$$

$$F_2 = F_1 - \frac{P}{r} = 800 - \frac{860}{2.618} = 471.5$$

$$F_i = \frac{F_1 + F_2}{2} = 635.7 \text{ N.}$$

Q6/ $T_i = 100 \text{ N}$

$D = 0.16 \text{ m}$

$\mu = 0.31$

$\theta = 110^\circ$

$N = 3000 \text{ RPM}$

$F_1 = 128.91 \text{ N}$

$F_2 = 71.09 \text{ N}$

Q7/ $P = 3000 \text{ W}$

$N = 1000 \text{ RPM}$

$P_b = 1538.55 \text{ W}$

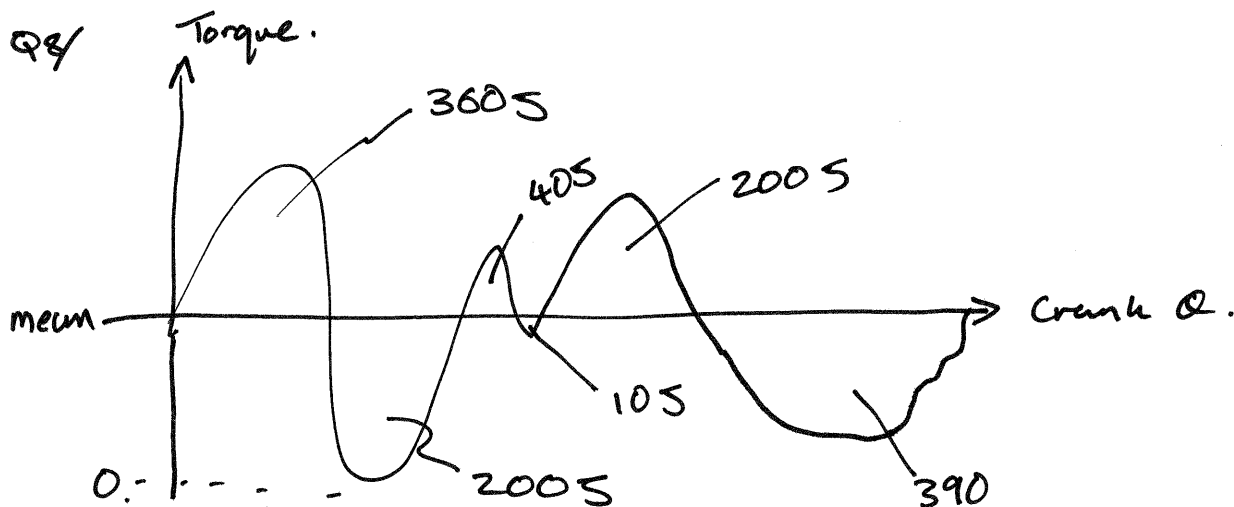
$D = 0.135 \text{ m}$

$\therefore n = \frac{P_t}{P_b} = 1.95 \therefore \underline{\underline{2 \text{ belts}}}$

$\mu = 0.36$

$\theta = 168^\circ$

$T_{\max} = 225 \text{ N}$



$N_{\max} = 4020 \text{ RPM}$

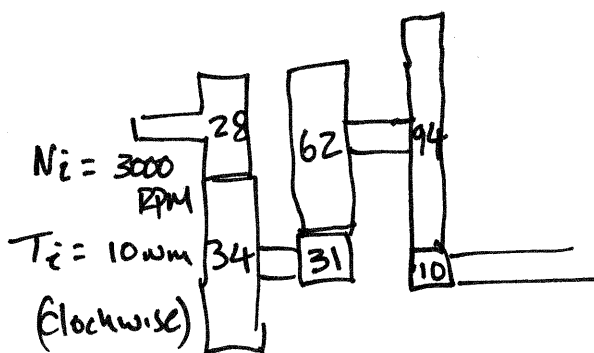
$N_{\min} = 3980 \text{ RPM}$

$K = 0.15 \text{ m}$

$m = 7.0 = \underline{\underline{9.88 \text{ kg}}}$

($N_m = 4000 \text{ RPM}$, $\omega_m = 418.88 \text{ rad/s}$, $\phi = 0.01$).
($I = 0.22 \text{ kgm}^2$).

Q9



$\eta = 0.81$

Answers

$N_0 = 1612 \text{ RPM}$ anti clock.

$T_0 = -2.09 \text{ Nm}$

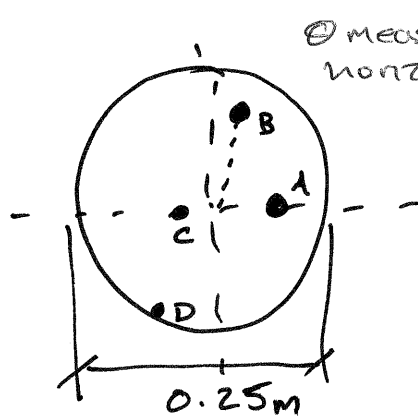
$P_i = 3141.6 \text{ W}$

$P_0 = 2544.69$

$T_h = -7.9 \text{ Nm}$ (anti clockwise)

$\eta = 0.26$

Q10/

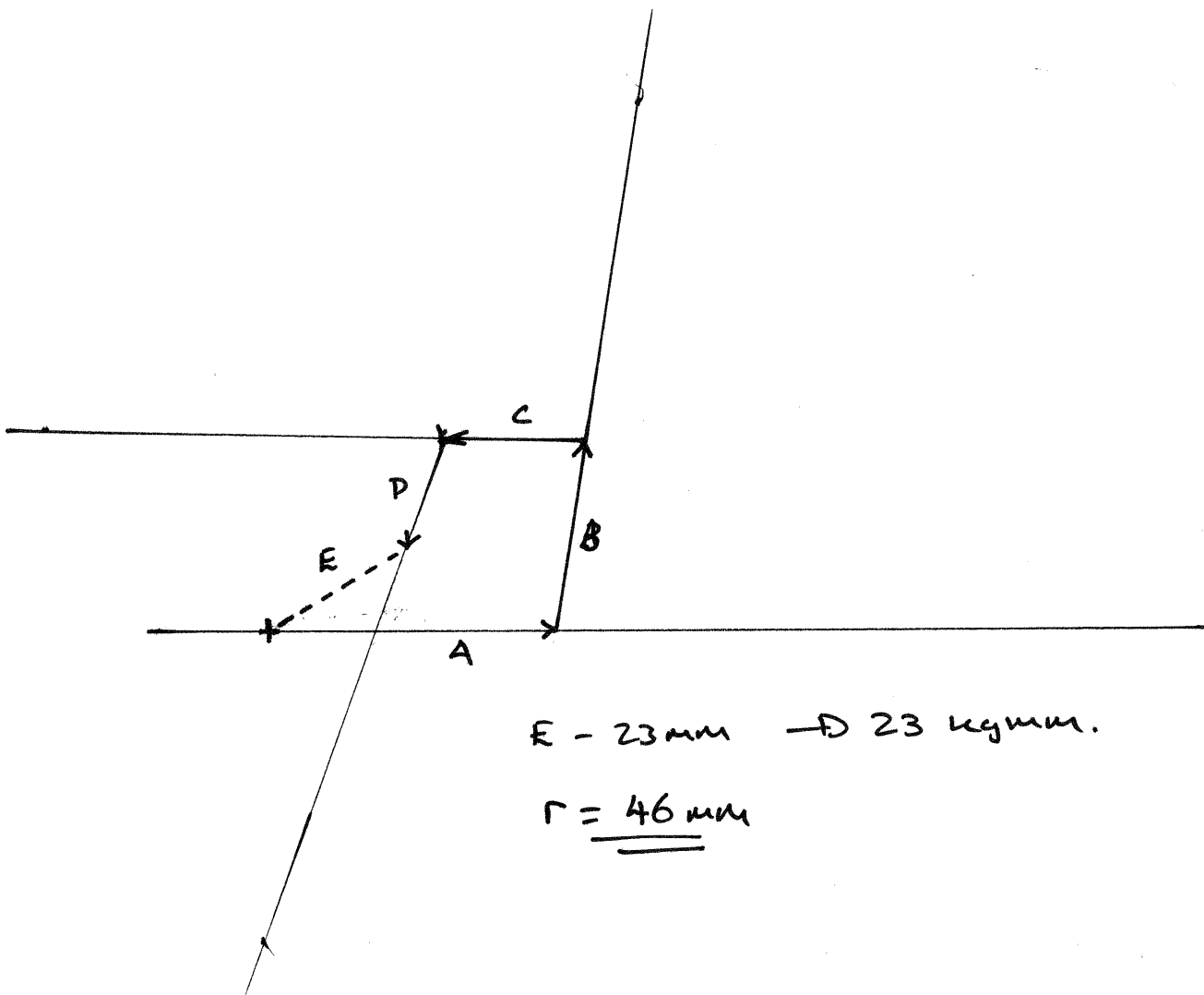


θ measured from horizontal.

	θ	m	r	mr
A	0	0.5	81	40.5
B	81°	0.3	90	27
C	179°	1.0	20	20
D	260°	0.15	110	16.5

$90^\circ \leq$
 $270^\circ \leq$

If E is ~~0.5 kg~~ what radius?
0.5 kg



E - 23 mm $\rightarrow$ 23 kgmm.

r = 46 mm