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N4

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1.1.10 L

1.1.1 J

1.1.2 E

1.1.3 A

1.1.4 F

1.1.5 ~~A B D~~ K

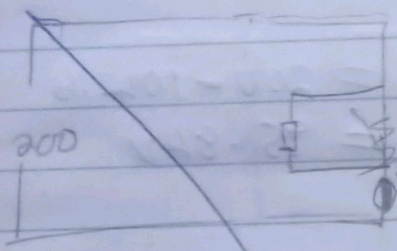
1.1.6 B

1.1.7 C

1.1.8 G

1.1.9 ~~E~~ H

1.2



$I_a = I_L - I_{sh}$

$I_{sh} = V/R_s$

$P_1 = 1250$ $I_a = 12A$

$R_{se} = 15$ $V = 200$

$R_{sh} = V_{sh} / I_{sh}$

$P_1 = V_1 \times I_a$

$= 1250\ 12 \times 200$

$= 2400\ W$

Sge

R_{SET} heater R:

$P = I^2R$

$\frac{1250}{12^2}$

$R = 8,681$

Total series $R = 15 + 8,681$

$= 23,681\ \Omega$

$V_{sr} = 23,681 \times 12$

1.2 $R_T = \frac{200}{12}$

$= 16,67\Omega$

Total $R_{return} = 16,67 - 32$

$\therefore R_H = \frac{V^2}{P}$

$= \frac{200^2}{1250}$

$= 32\Omega$

$R_{heater} = \frac{1250}{122}$

$= 8,68\Omega$

$V_{heater} = 12 \times 8,68$

$= 104,16$

$\therefore V_{return} = 200 - 104.16$

$= 95.84V$

$R_{return} = \frac{95.84}{12}$

$= 7,99\Omega$

$R_{unknown} = 15 - 7,99$

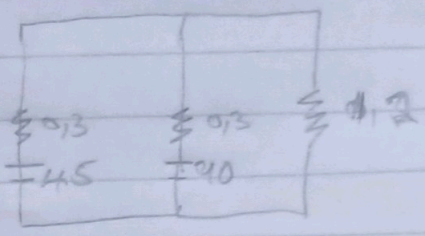
$= 7.01\Omega$

2.1 $MMF = R \times \Phi$

$= 60\,000 \times 6 \times 10^{-3}$

$= 360A$

2.2



$\therefore I = I_1 + I_2$

$E_1 = I_1 r_1 + IR$

$E_1 = I_1 r_1 + (I_1 + I_2)R$ ---①

$E_2 = I_1 r_2 + (I_1 + I_2)R$ ---②

$I_1 = \frac{E_1 - I_2 R}{r_1 + R}$

$I_2 = \frac{E_2 - I_1 R}{r_2 + R}$

$I_1 = \frac{E_1(r_2 + R) - E_2 R}{r_1 r_2 + (r_1 + r_2)R + R^2}$

$= \frac{45(0,3 + 1,2) - 90(1,2)}{0,3 \times 0,3 (0,3 + 0,3) 1,2 + 1,2^2}$

$= -15A$

$$I_2 = \frac{90(0,3+1,2) - 45 \times 1,2}{0,3 \times 0,3(0,3+0,3)1,2 + 1,2^2}$$

$$= 50\,A$$

$$I_T = 50 + (-15)$$
$$= 35\,A$$

$$V_{eq} = IR$$
$$35 \times 1,2$$
$$= \underline{42\,V}$$

2.2.2 $I_1 = -15A$
$I_2 = 50\,A$

2.3 Farad is the SI unit of the ~~capaci~~ capacitance equal to the capacitance of a capacitor in which one coulomb of charge cause a potential different of one volt.

$$C_T = \frac{C_1 \times C_2}{C_1 + C_2}$$

$$= 1,7$$

2.4) $V = Q/C = \frac{1750 \times 10^{-6}}{(17+8)} =$

$$= \underline{\underline{5uF}}$$

2

2.2 $C_1 = Q/V$

$= \frac{1750 \times 10^{-6}}{17}$

$= 102,94 \mu F$

$C_2 = Q/V$

$\frac{1750 \times 10^{-6}}{8}$

$= 218,75 \mu F$

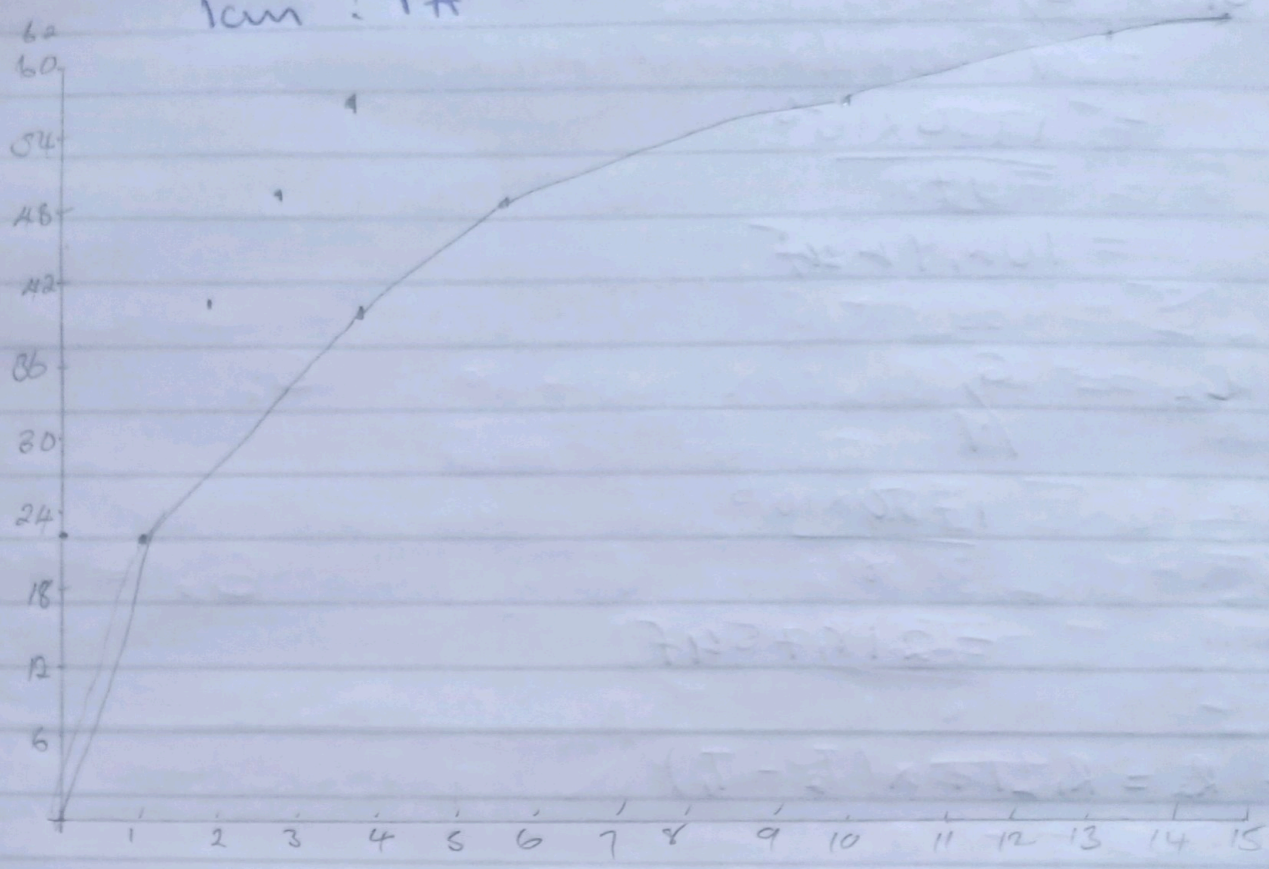
2.4. $R_2 = R_1 [1 + \alpha (T_2 - T_1)]$

$\alpha = \frac{\frac{R_2}{R_1} - 1}{T_2 - T_1}$

$\alpha = \frac{\frac{234}{210} - 1}{100 - 60}$

$\alpha = \underline{0,002857 °C}$

Scale 1cm : 5V
1cm : 1A



$I = V/R$

$= V/5$

3.3 $R_T = R_a + R_s$

$= 0,4 + 0,2$

$= 0,6\ \Omega$

$\therefore V_T = 50 \times 0,6$

$= 30V$

$Emf = V_a - V_{as}$

$= 400 - 30$

$= 370V$

3.3 use to support the field coils.

3.5 comutator ; rotor ; amature cote.

$$T = 1/f$$

$$f = 1/T$$

$$= \frac{1}{25 \times 10^{-3}}$$

$$= 40\ Hz$$

2.4

$$Z_1 = 15 + j10$$
$$Z_2 = 15 - j10$$

$$Z_1 = 18{,}028 \angle 33{,}690$$
$$Z_2 = 18{,}028 \angle -33{,}690$$

$$Z_T = \frac{Z_1 \times Z_2}{Z_1 + Z_2} = \frac{18{,}028 \angle 33{,}690 \times 18{,}028 \angle -33{,}690}{(15 + j10)(15 - j10)}$$

$$= \frac{325{,}009 \angle 0}{30}$$

$$= 10{,}834\ \Omega$$

2.42 $I = \$\ \frac{270{,}825}{10{,}834}$

$$I_T = 24{,}9976$$

$$= 25{,}00\ A$$

Chef is the to ~~support~~ support the armature assembly.

4.1 $E_m = 2\pi BAN_n$

$\therefore B = \frac{V_1}{4.44 N_1 f A}$

$= \frac{1110}{4.44 \cdot 50 \cdot 200 \cdot 10 \times 10^{-4}}$

$= 2.5\,T$

4.1.2 $\frac{V_1}{V_2} = \frac{N_1}{N_2}$

$\frac{1110}{111} = \frac{200}{N_2}$

$N_2 = 111 \times 200$

$1110 N_2 = \frac{22200}{1110}$

$N_2 = 20$ turns

4.2 $V_{max} = V_{rm} \times \sqrt{2}$

$= 422,2 \times \sqrt{2}$

$= 599,909\,V$

$= 599,909\,V$

4.21 $T = 1/f$

$f = 1/T$

$= \frac{1}{25 \times 10^{-3}}$

$= 40\ Hz$

4.24

$Z_1 = 15 + j10$

$Z_2 = 15 - j10$

$Z_1 = 18,028 \angle 33,690$

$Z_2 = 18,028 \angle -33,690$

$Z_T = \frac{Z_1 \times Z_2}{Z_1 + Z_2} = \frac{18,028 \angle 33,690 \times 18,028 \angle -33,690}{(15 + j10)(15 - j10)}$

$= \frac{325,009 \angle 0}{30}$

$= 10,834\ \Omega$

4.242 $I = \frac{270,825}{10,834}$

$I_T = 24,9976$

$= 25,00\ A$

4.24) $P = VI$

$= 270,825 \times 25$

$= 6770,625 W$

5.11 $B = \frac{V_1}{4.44 \times f \times N}$

$= \frac{2000}{4.44 \times 50 \times 200}$

$= 0,022 Wb$

5.12 $P_0 = 10 \times 0,3 \times 2000$

$= 600 W$

5.13 $I_m = I_0 \times \sin(\cos^{-1} 0,3))$

$I_m = 10 \times \sin 72,542$

$= 9,54 A$

5.2 Oil Natural.

Oil forced natural

Air forced natural

Water forced.