

Date: _____

Name

Syed Daniyal Shah

ID No

15863

Assignment

Dc machine and
Transformers

Date 22/05/2020

Date: _____

Q No 1 \Rightarrow

Given Data \Rightarrow

$$V_1 = 100V$$

$$V_2 = 600V$$

$$I_1 = 4A$$

Req^d Data $I_2 = ?$

Solution \Rightarrow

$$P = IAV$$

$$I_1 V_1 = I_2 V_2$$

$$I_2 = \frac{I_1 V_1}{V_2} \Rightarrow \frac{4(100)}{600} = \frac{4 \text{ Amp}}{6}$$

$$\text{or } I_2 = 0.667 A$$

Date: _____

Q No \rightarrow 2

Given Data

$$E_1 = 3300 \text{ V}$$

$$E_2 = 250 \text{ V}$$

$$f = 50 \text{ Hz}$$

$$A = 125 \text{ cm}^2$$

$$N_2 = 70 \text{ turns}$$

$$125 \times 10^{-4} \text{ m}^2$$

Required:

(a) $B_m = ?$ (b) $N_1 = ?$

Solution:

(a) The emf induced on Secondary side is given by:

$$E_2 = 4.44 \phi_m f N_2 = 4.44 B_m A f N_2$$

$$\left(\text{As } B = \frac{\phi}{A} \right)$$

$$B_m = \frac{E_2}{4.44 A f N_2} = \frac{250}{4.44 (125 \times 10^{-4}) (50)(70)}$$

$$B_m = 1.289 \text{ T (Ans)}$$

$$(b) \frac{E_2}{E_1} = \frac{N_2}{N_1} \Rightarrow N_1 = \frac{E_1}{E_2} N_2 = \frac{3300}{250} \times 70$$

$$N_1 = 924 \text{ Turns (Ans)}$$

Date: _____

~~Q No~~
Q No \Rightarrow 3

Given Data \Rightarrow

$$E_1 = 100V$$

$$N_1 = 800 \text{ turns}$$

$$N_2 = 200 \text{ turns}$$

Required

$$E_2 = ?$$

$$E/T = ?$$

Solution:

$$\frac{E_2}{E_1} = \frac{N_2}{N_1}$$

$$\text{OR } E_2 = \left(\frac{N_2}{N_1} \right) E_1$$

$$E_2 = \left(\frac{200}{800} \right) 100 \Rightarrow E_2 = \boxed{25V}$$

$$\text{volts per turn} = \frac{E_1}{N_1} = \frac{100}{800} = \boxed{0.125}$$

$$\text{OR volts per turn} : \frac{E_2}{N_2} = \frac{25}{200} = \boxed{0.125}$$