



Faculty of Electrical & Electronics Engineering
DEE3133 Basic Electrical Machine & Power System

Name: _____

ID: _____

Section: _____

Date: _____

(Failed to complete all the particulars above will be penalized 2 marks)

QUIZ 3

A 415 V series dc motor has nominal armature current of 15 A. The armature and field resistances are 0.9Ω and 1.5Ω respectively. Stray losses are assumed constant at 250 W throughout the operation of the motor. Determine:

- i. The back-emf/counter-emf, E_a
- ii. The mechanical power developed by the motor, P_m
- iii. The output power, P_o
- iv. Percentage of efficiency of the machine

[10MARKS]

Equations :

$$V_T = E_a + I_a (R_a + R_f)$$

$$P_m = E_a I_a$$

$$P_o = P_m - P_\mu$$

$$\% \eta = \frac{P_o}{P_{in}} \times 100\%$$

$$P_{in} = V_{in} \times I_a$$

Answer :