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**University Examinations 2014/2015**

SECOND YEAR, FIRST SEMESTER EXAMINATION FOR DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

**EEE 0228: ELECTRICAL MEASUREMENT AND TESTING II**

**DATE: DECEMBER 2014 TIME: 1**$\frac{1}{2}$ **HOURS**

**INSTRUCTIONS:** *Answer questions* ***on****e**and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. Explain the following:
2. On what principle does D’Arsonval galvanometer operate? (3 marks)
3. What happens when a permanent magnet moving coil instrument is connected to a.c supply? (1 mark)
4. What happens when a voltmeter is connected in series with the circuit

(1 mark)

1. (i) Describe the working principle of a moving iron instrument (2 marks)

(ii)A moving coil meter gives a full scale deflection with a current of 5 mA. If the coil of the instrument has a resistance of 10 ohms, show how it can be adopted to work as an arimeter with a range of 0-1- amperes. (5 marks)

1. Draw the possible methods of connecting the pressure coil of a wattmeter and compare the errors (7 marks)

Explain the meaning of compensation winding in a wattmeter and show how they help in reducing errors (1 mark)

1. (i) Explain the working of frequency meter which depends on mechanical resonance for its action (2 marks)

(ii) Explain the significance of using four terminals for the measurement of low resistance (2 marks)

 (iii)Enumerate the factors responsible for in accuracy in magnetic measurements (6 marks)

**QUESTION TWO**

1. (i) What is meant by magnetic square (...marks)

(ii) Explain with neat sketches the three types of magnetic square (3 marks)

(iii) Describe the Lloyd-Fisher magnetic square method of d determining iron loss

(3 marks)

1. How are errors in the above measurement corrected (1 mark)
2. (i) Explain the constructional features of a flux meter (...marks)

(ii) Show that for a flux meter (5 marks)

NΦ=K ($θ\_{2}-θ\_{1})$

Where N=tuns

Φ=change in flux

$θ\_{1}$= initial reading

$θ\_{2}$=final reading

$K$= constant

 (iii) How does flux meter differ from ballistic galvanometer (3 marks)

**QUESTION THREE**

1. Describe the method of determining B-H curve (5 marks)
2. Give the description and theory of Hibbert’s magnetic standard (5 marks)
3. (i) Sketch a diagram indicating the meaning of hysteresis loop (.. marks)

(ii)How is hysteresis loop determined in the step of step method (5 marks)

**QUESTION FOUR**

1. The arm of a Maxwell bridge are arranged as follow;-

AB is a non-reactive resistor of 1000 ohms in parallel with a condenser of 0.5 $μ$F, BC is a non-reactive resistor of 600 ohms, CD is an unknown inductive resistor and DA is a non-reactive resistor of 400 ohms. Find the resistance and inductance in CD (5 marks)

1. Show that the weir frequency bridge will be balanced at only one frequency give by

f=

Where C1, C2, R1 and R2 have their usual meaning (2 marks)

1. In a specific Kelvin bridge the ration of the arms are 1:100. The standard resistance is 20 ohms. Find out the unknown resistance (3 marks)
2. The readings on the armeters connected for a 3-armeter method of power measurements are 2.5A, 4A and 5.6A in the non-inductive resistor, the load and main respectively. The terminal voltage is 300 volts. Calculate the value of
3. Non-inductive resistor (1 mark)
4. the load impendence (2 mark)
5. The power absorbed by load (1 mark)
6. Power factor of load (2 marks)