University Examinations 2013/2014

FIRST YEAR, SECOND SEMESTER EXAMINATION FOR DIPLOMA IN ELECTRICAL ENGINEERING

EEE 0208: ELECTRICAL MEASUREMENT AND TESTING I

DATE: APRIL 2014   **TIME: 1 ½ HOURS**

INSTRUCTIONS: *Answer question **one** and any other **two** questions*

QUESTION ONE – (30 MARKS)

(a) Explain the following terms in reference to electrical instruments.
- (i) A shunt
- (ii) A multiplier   (6 Marks)

(b) State:
- (i)   Two advantages of digital over analogue instruments.
- (ii)   Two damping methods used in analogue instruments
- (iii)   The difference between digital and analogue instruments.   (9 Marks)

(c) Explain the operation of induction type single phase energy meter using a well labeled diagram.   (6 Marks)

(d) With the aid of a diagram, explain the functions of the three essential parts of an electronics instrument.   (9 Marks)

QUESTION TWO – (15 MARKS)

(a) Explain briefly the working principles of the following instruments:
- (i)   Indicating instruments
- (ii)   Recording instruments
- (iii)   Integrating instruments   (6 Marks)

(b) Explain the operation of a Q-meter using a well labeled diagram.

(c) Name three areas of application of a Q-meter.   (9 Marks)

QUESTION THREE – (15 MARKS)

    (a) With reference to electrical instruments, explain the following terms:
        (i)   Deflecting torque
        (ii)   Controlling torque
        (iii)   Damping torque   (6 Marks)
    (b) A moving coil instrument has a resistance of 10Ω and gives full-scale deflection with a current of 10mA. Calculate the value of additional resistance to enable the instrument to read up to:
        (i)   5A
        (ii)   5V   (9 Marks)

QUESTION FOUR – (15 MARKS)

    (a) Name any two advantages and two disadvantages of :
        (i)   Moving coil instrument
        (ii)   Moving iron instrument   (6 Marks)
    (b) (i) With the aid of a labeled diagram, explain the operation of a current instrument transformer.

        (ii) State three advantages of instrument transformer over shunts and multipliers.
                                                                    (9 Marks)