# DIPLOMA IN ELECTRICAL ENGINEERING (DELVI)

## Term-End Examination

## December, 2013

## BIEE-039 : ELECTRICAL MEASUREMENTS AND INSTRUMENTS

*Time : 2 hours* *Maximum Marks : 70*

*Note : (i) Q.No. **1** is **compulsory**.*

*(ii) Attempt **five** questions in all.*

1. (a) In a present day measurement system, which statement is more relevant ? **7x2=14**
   (i) direct methods are commonly used.
   (ii) use of direct methods is limited but indirect methods are commonly used.
   (iii) both direct and indirect methods used
   (iv) All above.

   (b) In measurement systems which of the following static characteristics are desirable.
   (i) Accuracy
   (ii) Sensitivity
   (iii) Reproducibility
   (iv) All above

   (c) A controlling torque in a Meggar is provided by :
   (i) Spring
   (ii) Weight attached to the moving system
   (iii) does not need any controlling torque
   (iv) None of above.

(d) Thermo couple instruments can be used for frequency range :

(i) upto 100Hz

(ii) upto 5000Hz

(iii) upto 1MHz

(iv) 50MHz and above

(e) In an electrodynamometer type of wattmeter :

(i) The Current coil is made fixed

(ii) Pressure Coil is made fixed

(iii) both are fixed

(iv) both are movable.

(f) In a circuit the focusing anode is located :

(i) between pre - accelerating and accelerating anode.

(ii) after accelerating anode.

(iii) before pre-accelerating anode.

(iv) none of above

(g) A vertical amplifier for a CRO can be designed for :

(i) only a high gain

(ii) only a broad bandwidth

(iii) a constant gain times bandwidth product

(iv) all above

2. (a) Explain the functioning of ramp type digital voltmeter. 7

(b) Draw and explain the circuit of a digital frequency meter. What are the different methods used for high frequency determination ? 5+2=7

3. (a) Explain how power can be measured in a 3-phase circuits with the help of two-wattmeter method. 7

(b) Explain the working of 3 - phase wattmeter with neat sketch. 7

4. (a) Describe the construction and working of PMMI instrument .Also derive the equation for deflection if the instrument is spring controlled. 7

(b) Explain the working principle of single phase power factor meter with the help of neat diagram. 7

5. Explain the working of Meggar with the help of neat diagram. 14

6. Explain the working of : 5+5+2+2=14

(a) Attraction type.

(b) Repulsion type of moving iron instrument with the help of neat diagram. Also describe the methods of producing, controlling and damping torque in them. Explain why these meters can be used on both AC or DC.

7. Draw and explain the equivalent circuit and phasor diagram of a current transformer and also explain the effect of secondary burden on the ratio and phase error of a C.T. 5+5+4=14