

GUJARAT TECHNOLOGICAL UNIVERSITY**B.E. Sem-Vth Examination December 2010****Subject code: 152402****Subject Name: Electrical Measurements & Electronics Instruments****Date: 15/12/2010****Time: 03.00 pm - 05.30 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain principle and operation of PMMC instrument. Derive torque equation for it. **07**
(b) What are static and dynamic characteristics in measurement system? State various static and dynamic characteristics of measuring instruments. Define any three static characteristics. **07**

- Q.2** (a) With neat diagram explain construction and operation of single phase energy meter. **07**
(b) State various types of errors in potential transformer. Explain how they can be reduced. **07**

OR

- (b) Explain measurement of three phase power using two watt meter method. Draw necessary diagrams. **07**

- Q.3** (a) Explain types of measurement method in broad sense. Classify and explain measuring instruments. **07**
(b) A PMMC instrument with 800Ω coil resistance gives Full Scale Deflection (FSD) with a $250\mu\text{A}$ coil current. Calculate the required shunt resistance to convert the instruments into a DC ammeter with an FSD of 1) 40mA 2) 60mA . **07**

OR

- Q.3** (a) Explain (1) Q-factor of inductor (2) D-factor of capacitor. **07**
(b) When the signal generator frequency of a Q meter is set to 1.45 MHz , the Q of a coil is measured as 98 when $C = 135\text{pF}$. Determine the coil inductance and resistance. **07**

- Q.4** (a) Draw the circuit of a 4-bit DAC using R/2R network. Explain circuit operation and DAC output resolution. **07**
(b) Explain Potentiometer calibration method. **07**

OR

- Q.4** (a) State various method of low resistance measurement. Explain any one method for the same. **07**
(b) List the different between power transformer and instrument transformer. **07**

- Q.5** (a) Give different accessories for measuring instruments. Explain 1) RF demodulator probes 2) current probes. **07**
(b) Explain voltage ohm meter (VOM) with neat diagram. **07**

OR

- Q.5** (a) Explain Creep, Overload Compensation and Temp Compensation in single phase energy meter. **07**
(b) Why light – beam Galvanometer is used? Explain its construction and operation. **07**
