

**III B.Tech I Semester Supplementary Examinations, April/May 2005**  
**ELECTRICAL MEASUREMENTS**  
**(Electrical & Electronic Engineering)**

**Time: 3 hours****Max Marks: 80**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. (a) Discuss why indicating instruments with gravity control have a non-uniform scale and with spring control have a uniform scale? Explain.  
(b) Compare air-friction damping, fluid friction damping, eddy-current damping which have been used for producing damping torque in an indicating instrument.
2. Draw the equivalent circuit and phasor diagram of a current transformer. Derive the expressions for ratio and phase angle errors.
3. (a) With suitable diagram explain the working of electrodynamic type frequency meter.  
(b) Write short notes on Synchroscope.
4. (a) Why trivector meter is used? Explain its working.  
(b) An energy meter is designed to make 100 revolutions of disc for one unit of energy. Calculate the number of revolutions made by it when connected to load carrying 40 amps at 230 volts and 0.4 power factor for an hour. If it actually makes 360 revolutions, find the percentage error.
5. (a) With a neat sketch explain the operation of a potentiometer what is standardization ? How is it achieved?  
(b) A simple slide wire is used for measurement of current in a circuit. The voltage drop across a standard resistor of  $0.1\Omega$  is balanced at 75cm . Find the magnitude of the current if the standard cell emf of 1.45 V is balanced at 50cm.
6. (a) An electrically deflected CRT has a final anode voltage of 2000v and parallel deflecting plates of 1.5cm long and 5mm apart. If the screen is 50 cm from the centre of deflecting plates find
  - i. beam speed
  - ii. the deflection sensitivity of the tube
  - iii. the deflection factor of the tube.  
(b) A lissajous pattern on an oscilloscope is stationary and has 5 horizontal tangencies and 2 vertical tangencies. The frequency of horizontal input is 1000Hz. Determine the frequency of vertical input.
7. (a) With neat sketches, explain the measurement of capacitance using low voltage schering bridge.

- (b) Explain the special features of high voltage schering bridge and show how capacitance value can be measured.
8. (a) Describe the Epstein square method for finding the iron losses in the square specimen.
- (b) The Hysteresis loop for an iron specimen is drawn to a scale of 1cm : 200Amp/metre and 1cm : 0.1T. The area of the loop is 50 Sq.cm. Assuming the density of the specimen to be 7.5 gm/cc. Calculate the hysteresis loss in watts/kg at 50 HZ supply.

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