

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0209

Roll No.

--	--	--	--	--	--	--	--	--	--	--

B.Tech.

(SEM. III) ODD SEMESTER THEORY

EXAMINATION 2012-13

**ELECTRICAL MEASUREMENTS AND
MEASURING INSTRUMENTS**

Time : 3 Hours

Total Marks : 100

Note :- Attempt **all** questions.

1. Attempt any **four** parts : **(5×4=20)**
- (a) What is an instrument ? Classify various types of electrical instruments.
- (b) What are the various types of errors occurring in electrical measurements ? Explain them.
- (c) A resistor is measured by the Voltmeter-Ammeter Method. The voltmeter reading is 123.4 volts on the 250 V scale and the ammeter reading is 283.5 mA on the 500 mA scale. Both meters are guaranteed to be accurate within ± 1 percent of full scale reading. Calculate (i) the indicated value of the resistance, (b) the limits within which the result can be guaranteed.
- (d) Describe the principle of operation of an electrodynamic wattmeter.

- (e) Explain the various operating torques in an energymeter.
- (f) Explain the causes and remedies of the errors occurring in a wattmeter.

2. Attempt any **two** parts : (10×2=20)

- (a) Explain the construction and working of a potential transformer. Draw and explain the phasor diagram. What are the various errors occurring in it ? Explain.
- (b) Explain the construction and working of a Wein bridge used for the measurement of frequency.
- (c) Explain the construction, principle of operation and working of a current transformer. Draw its phasor diagram and explain the errors that normally occur in its operation.

3. Attempt any **four** parts : (5×4=20)

- (a) Explain the loss of charge method for measurement of resistance.
- (b) What precautions are taken while measuring low resistances ? Explain the reason how a Kelvin's double bridge measures low resistances without error.
- (c) Explain the concept behind AC bridges with the help of a suitable example.
- (d) Draw the bridge arrangement and describe the Hay's bridge for inductance measurement. Draw the phasor diagram.
- (e) Draw the Hay's bridge and its phasor diagram. Explain the operation of a capacitance measuring instrument.
- (f) Explain the principle of operation of a Q meter.

4. Attempt any **two** parts : (10×2=20)
- (a) Explain the construction and principle of operation of a polar type potentiometer. How is it standardised ?
 - (b) Explain the various applications of the AC Potentiometers.
 - (c) Explain the construction and principle of operation of a Ballistic Galvanometer. How is it calibrated ?

5. Attempt any **two** parts : (10×2=20)
- (a) How many types of digital voltmeters are there ? Explain the Integrating type of Digital voltmeter. What are its specific advantages ?
 - (b) What is total harmonic distortion ? How many types of harmonic analyzers are there ? Explain the concept of tuned circuit harmonic analyzer.
 - (c) Explain the construction and working of a basic Cathode Ray Oscilloscope (CRO) Circuit with the help of relevant diagrams.