



203144

Seat No.	
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S.E. (Electrical) (Semester – I) Examination, 2014
ELECTRICAL MEASUREMENTS AND INSTRUMENTATION
(2012 Course)

Time : 2 Hours

Max. Marks : 50

- Instructions :** 1) Answer Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6, Q. 7 or Q. 8.
2) **Neat diagrams must be drawn wherever necessary.**
3) Figures to the **right** side indicate **full** marks.
4) **Use of calculator is allowed.**
5) **Assume suitable data if necessary.**

1. a) Explain construction and working of Permanent Magnet Moving Coil Instrument. 6
b) What are the different detectors used in a.c. bridges ? Elaborate each type in brief.
Derive the general equation for bridge balance. 6

OR

2. a) The four arms of ac bridge is arranged as follows. 6
AB unknown impedance; BC 1000 Ω resistance
CD 833 Ω resistance in series with 0.3 μ F capacitor; DA 16800 Ω resistance. Determine unknown impedance showing resistance and inductance or capacitance.
b) What is meant by static and dynamic characteristics of measuring instruments ?
Explain : Accuracy, resolution. 6

3. a) With the help of circuit and phasor diagram explain reactive power measurement by on wattmeter and a two way switch. 6
b) A 230 V, 50 Hz, 1 Φ energy meter has a constant of 2000 imp/KWh, while supplying a non inductive load of 4.4 A at normal voltage the meter takes 3 minutes for 100 imp. Calculate the percentage error of instrument and state whether meter is running fast or slow. 6

OR

4. a) Explain the errors in energy meter with compensation. 6
b) A 3 Φ balanced load connected across a 3 Φ , 400 V ac supply draws a line current of 19 amp. Two wattmeter are used to measure input power. The ratio of two wattmeter reading is 2 : 1. Find the reading of two wattmeter. 6

P.T.O.



5. a) In an experiment, the voltage across 5 kW resistor is applied to C.R.O. The screen shows a sinusoidal signal of total vertical occupancy 4 cm and total horizontal occupancy of 2 cm. The front panel controls volts/div and time/div are on 5 V/div and 5 ms/div respectively. Calculate the maximum, rms values of voltage across resistance and current through resistance. Also find its frequency. **6**
- b) Explain pressure capacitance transducer with a neat diagram. Write advantages and disadvantages of capacitive transducer. **7**
- OR
6. a) Explain different characteristics of transducer. **6**
- b) Explain Pirani guage for measurement of low pressure. Also state advantages and disadvantages. **7**
7. a) Explain level measurement by mechanical method. **6**
- b) Explain LVDT for measurement of displacement with neat diagram. **7**
- OR
8. a) Explain semiconductor strain gauge for measurement of displacement with the help of contractional diagram. **6**
- b) Explain hydraulic method for measurement of level. **7**
