B. Tech. Sem –III (Electrical Engg.) 2014 COURSE) (CBCS) :
WINTER - 2018
SUBJECT: ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

Day: Monday
Date: 03/12/2018

Time: 10.00 AM TO 01.00 PM
Max. Marks: 60

W-2018-2300

N.B:

1) All questions are **COMPULSORY.**
2) Figures to the right indicate **FULL** marks.

Q.1 **a)** State the significance of measurement. Give the classification of instruments. **(05)**

b) Derive the expression for Anderson's Bridge for measurement of unknown inductance. **(05)**

OR

Q.1 **a)** Write the expression for ratio and phase angle error in case of CT and PT. **(05)**

b) Draw and explore the Wein's Bridge. Give its expression. **(05)**

Q.2 **a)** 3 identical coils each of $(4.2+j5.6)\Omega$ are connected in star across 415V, 3phase, 50Hz supply. Find *Vph* and *Iph.* **(05)**

b) A 50A, 230V energymeter makes 61 Rev in 37 Sec. if the meter constant is 520Rev/kWh. What is the %error? **(05)**

OR

Q.2 **a)** A 1 phase energy meter has a constant of 6000Rev/kWh. A test was carried out with resistive load for 1 minute during which the meter made 21 Rev. the voltage was 110V and current was 2A. Calculate the %error. **(05)**

b) A watt meter with a current coil in R line and the pressure coil across Y & B reads 3.2kW for a balanced load of 0.6 lagging pf. The supply voltage is 400V. Determine active and reactive power of the load. **(05)**

Q.3 **a)** Explore the sketch of Vacuum Type Electronic Voltmeter. State its advantages. **(05)**

b) Explore the working principle of digital storage oscilloscope. How it is superior to CRO. **(05)**

OR

Q.3 **a)** State the advantages of Power Analyzer. Also mentions its applications. **(05)**

b) Explain the concept of Numeric Relay with block diagram. **(05)**

P.T.O.

Q.4 **a)** Explain with constructional details the working and applications of Load Cell. **(05)**

b) Explain the following terms related with strain gauge **(05)**
i) Gauge Factor
ii) Piezo Resistivity.

OR

Q.4 **a)** What are the salient features of semiconductor strain gauge? State its applications. **(05)**

b) What are the limitations of capacitive transducer? Also state various displacement transducers. **(05)**

Q.5 **a)** What are the various low pressure measurement techniques? Explore ionization type vacuum pressure transducer. **(05)**

b) Draw and explore the Platinum Resistance Thermometer. **(05)**

OR

Q.5 **a)** Differentiate between 3 leads and 4 leads RTDs with sketch. **(05)**

b) Explore the working of Quartz crystal thermometer. Mention its applications. **(05)**

Q.6 **a)** Differentiate between analog and digital recorders. **(05)**

b) State different velocity measurement techniques. Explore any one. **(05)**

OR

Q.6 **a)** State different flow measurement techniques. Explore one with a neat sketch. **(05)**

b) Explore the terms related with digital meters **(05)**
i) Resolution
ii) Sensitivity.

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