

B. TECH. SEM -III (ELECTRICAL ENGG.) 2014 COURSE) (CBCS) :
WINTER - 2017

SUBJECT : ELECTRICAL MEASUREMENTS & INSTRUMENTATION

Day : **Monday**
Date : **22/01/2018**

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

W-2017-2036

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat and labeled diagrams **WHEREVER** necessary.
- 4) Assume suitable data if necessary.

Q.1 a) Explain the analog and digital modes of operation of instruments. Explain how the resolution of digital instruments can be increased. [05]

b) Explain the sources and the null detectors that are used for AC bridges. [05]

OR

a) Explain in detail the construction and working of chip-on ammeters. Explain their utility. [05]

b) Draw the equivalent circuit and phasor diagram of potential transformer. Write the equations for its ratio and phase angle error. [05]

Q.2 a) A 3 phase 400 V, motor load has a power factor of 0.6. Two wattmeters connected to measure the input. They show input = 50kW, find the reading of each instrument. [05]

b) Explain the construction of a two element induction type energy meter. [05]

OR

a) The meter constant of 250V, 12 A energy meter is 1900 Rev/kWh. The meter is tested at half load and rated voltage and unity p.f. The meter makes 90 Rev in 140 sec. Determine the meter error at half load. [05]

b) Explain the errors in Electrodynamicometer type wattmeters. [05]

Q.3 a) Explain the advantages of Electronic voltmeter over conventional type voltmeters. [05]

b) Explain the working of Heterodyne Wave Analyzers. Also, mention its applications. [05]

OR

a) Explain how vacuum tube voltmeters can be converted to an RMS reading voltmeter. [05]

b) Explain the concept Standing Wave Ratio. Also, mention its applications. [05]

P.T.O.

- Q.4 a)** Why is the frequency of excitation of primary winding kept very high as compared to frequency of the signal being detected in case of LVDT? [05]
- b)** State the importance of level measurement. Also, mention the different methods of level measurement. [05]

OR

- a)** Mention the advantages of Electrical type level measurement over mechanical type. Also, explain the working of nuclear radiation level measurement technique. [05]
- b)** Explain the difference between un-bonded and bonded types of strain gauge with a neat sketch. [05]
- Q.5 a)** Explain the terms related with pressure measurements: [05]
i) Static pressure ii) Dynamic pressure iii) Head pressure
- b)** State the difference between 3 lead RTD and 4 lead RTD used for temperature measurement. [05]

OR

- a)** Explain the construction and principle of Platinum Resistance Thermometer. [05]
- b)** Explain the construction and operating principle of thermocouple vacuum gauge used for pressure measurement. [05]
- Q.6 a)** Explain the functioning of basic type of strip chart recorder. [05]
- b)** Explain the construction and working of turbine flow meter. [05]

OR

- a)** What is an X – Y recorder? Distinguish it from X – T recorder. [05]
- b)** Explain the construction and working of ultrasonic flow meter. [05]

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