

Code No: 09A50406

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B. Tech III Year I Semester Examinations, November/December-2013

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 75

**Answer any five questions
All questions carry equal marks**

- 1.a) What are the different types of errors found in a measurement? Explain statistical analysis of errors.
- b) With a neat sketch explain the working of a true RMS voltmeter. [8+7]
- 2.a) With an example explain the working of successive approximation DVM.
- b) A $3\frac{1}{2}$ digit DVM has an accuracy specification of ± 0.5 percent of reading ± 1 digit.
 - i) What is the possible error in volt, when the instrument is reading 5.00 V on the 10 V range?
 - ii) What is the possible error in volt, when reading 0.1 V on the 10 V range. [7+8]
- 3.a) What is meant by distortion factor? How is it measured? Explain.
- b) Explain the working of harmonic distortion analyzer using bridged T-network. [7+8]
- 4.a) Explain the advantages and disadvantages of Wheatstone bridge.
- b) A sample of Bakelite was tested by Schering bridge method at 11 kV, 50 Hz. Balance was obtained with the following arrangements.

Arm AB: the dielectric material under test in the form of a capacitor.
Arm BC: a standard air capacitor of $100\ \mu\text{F}$.
Arm CD: a capacitor of $0.6\ \mu\text{F}$ in parallel with a non reactive resistance of $300\ \Omega$.
Arm DA: a non reactive resistor of $100\ \Omega$.
Calculate the capacitance and equivalent series resistance of the specimen. [5+10]
- 5.a) Derive the expression for deflection voltage with respect to oscilloscope tube.
- b) Explain with neat sketches the time base generator in the CRO. [7+8]
- 6.a) With neat sketches, bring out the differences between a dual trace and dual beam oscilloscope.
- b) Explain with a neat sketch the operation of X-Y recorder. [7+8]
- 7.a) From the first principles derive the expression for the gauge factor of a electrical strain gauge.
- b) Explain the principle of working a LVDT. [8+7]
8. With a neat sketch explain the working principle of electromagnetic flow meter. List the applications. [15]
