

TEC-303

Printed Pages : 4

Roll No. to be filled in your Answer Book

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B. Tech

THIRD SEMESTER UTU EXAMINATION, 2013-14

Electronic Measurement and Instrumentation

Time : Three Hours]

[Max. Marks : 100

Note:- Attempt All Questions. All Questions carry equal marks.

Q1. Attempt any four Questions of the following:-

4x5=20

- A voltmeter has a range of 0-5 V. The true value of the measured voltage is 3 v, while the read value is 2.95 V. What is the absolute error and relative error?
- Write the need of calibration and explain process of calibration.
- Explain Series ohmmeter.
- What is the principle of working of magnetic recorders? Explain the recording process.
- Write a short note on PMMC instruments.
- Explain plotters.

Q2. Attempt any four Questions of the following:- 4x5=20

- (a) What is dynamic response? Explain the various types of dynamic response. How are they differ from dynamic characteristics?
- (b) Distinguish between direct and indirect methods of measurement. Give examples to support your answer.
- (c) Compare features of digital and analog voltmeters based on advantages and applications.
- (d) Explain the Quieting method to measure sensitivity of communication receivers.
- (e) Derive an expression for the sensitivity of a Wheatstone bridge.
- (f) Write the DSO applications.

Q3. Attempt any two Questions of the following:- 2x10=20

- (a) (i) Define the following with respect to the measuring system:
 - (1) True value (2) Static correction
 - (3) Relative error (4) Reproducibility
- (ii) Explain the working of a True RMS voltmeter.
- (b) Draw a circuit diagram of a Q-meter and explain its working. Give its applications.
- (c) (i) Explain with the help of a diagram the working of simple multimeter.
- (ii) Explain an arrangement for the measurement of Standing Wave Ratio.

Q4. Attempt any two Questions of the following:- 2x10=20

- (a) A voltmeter having a sensitivity of $100\ \Omega/V$ reads 100V on its 150 V scale when connected across an unknown resistor in series with a milli-ammeter. When the milli-ammeter reads 5mA, Calculate
- (1) apparent resistance of the unknown resistor,
 - (2) actual resistance of the unknown resistor and
 - (3) error due to the loading effect of voltmeter.
- (b) Explain D/A and A/D converters w.r.t signal conditioning of the inputs.
- (c) Explain the working of Digital Data Recording. Give its applications.

Q5. Attempt any two parts of the following 2x10=20

- (a) (i) Draw the scheme of a Multi-range ammeter. Design a multi-range DC ammeter with an internal resistance $10\ \Omega$. The full scale deflection current is 10 mA and it is required to measure 0 to 50 mA, 0 to 100 mA and 0 to 250 mA.
- (ii) Bring out the difference between CRO and recorders. Draw the schematic of a simple X-Y recorder.

- (b) Define sensitivity and deflection factor of a Cathode Ray Tube(CRT). What are the role of the following in CROs:
- (i) Time base generator circuit
 - (ii) X-channel
 - (iii) Triggered Sweep
 - (iv) Astigmatism
- (c) Explain the basic elements of a function generator. What is the importance of:
- (i) Duty cycle
 - (ii) Rise time

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