

II B.Tech II Semester Examinations, April/May 2012
CALIBRATION AND ELECTRONIC MEASUREMENTS
Electronics And Instrumentation Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Write short notes on the concept of traceability?
 (b)

SCALE READING	PRECISION VOLTAGE	CORRECTION
100	103	+3
90	93	+3
80	82.5	+2.5
70	72.5	+2.5
60	62	+2
50	51.7	+1.5
30	31	+1
20	19.7	-0.3
10	9.5	-0.5
0	0	0

For the 30 and 70 readings in the calibration chart shown above determine the instrument accuracy as a percentage of the reading and as a percentage of full scale? [16]

2. (a) Draw and explain a few basic rectifier circuits suitable for measuring A.C. voltages using D.C. electronic voltmeter.
 (b) A sawtooth voltage has a peak value of 50V and a time period of 3.0 seconds. Calculate the error when measuring this voltage with an average reading voltmeter calibrated in terms of rms value of a sinusoidal wave. [8+8]
3. Will the wave form displayed on the CRT screen of a sampling Oscilloscope be at a higher frequency than the actual input signal. [16]
4. Explain the F.M method of magnetic tape recording and explain its advantages and disadvantages. [16]
5. Describe how an unknown capacitance can be measured with the help of D' Sauty's bridge. What are the limitations of this bridge and how are they overcome by using a modified form of D'Sauty's bridge? Draw phasor diagrams to illustrate your answer. [16]
6. (a) Define the terms accuracy, error, precision, resolution, expected value, and sensitivity.
 (b) The expected value of the voltage across a resistor is 80 V. However, the measurement gives a value of 79V. Calculate:

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Set No. 2

- i. Absolute error
 - ii. Percent error
 - iii. Relative accuracy and
 - iv. Percentage of accuracy. [6+10]
7. Explain the indirect method of frequency Synthesis. [16]
8. (a) Explain the salient constructional features of a “Standard resistor” with a neat diagram and explain how it works.
- (b) What are the sources of error in the functioning of the above standard? What are the remedial measures taken to minimize the errors? [8+8]

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