

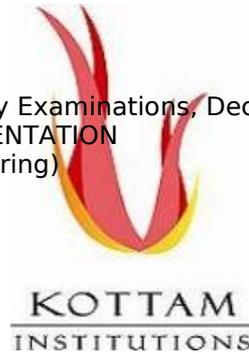
Code No: R5410402

1

IV B.Tech I Semester(R05) Regular & Supplementary Examinations, December 2009
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Electronics & Communications Engineering)

Time: 3 hours Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks



1. (a) Explain the functioning of a potentiometer type digital voltmeter.
(b) A 3 1/2 digit of DVM has an accuracy 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?
[8+8]

2. (a) Explain briefly the operation of single Op Amp square wave generator.
(b) Do you prefer a linear relationship or nonlinear relationship with respect to the charging of a capacitor in generating the triangular wave? If so why?
[8+8]

3. (a) Write short notes on
 - i. Logic probe
 - ii. Logic clip.
(b) Explain a logic analyzer and its uses in locating faults in computer buses.
[8+8]

4. (a) What are the advantages of dual beam for multiple trace oscilloscopes?
(b) How is the vertical axis of an oscilloscope deflected? How does this differ from horizontal axis?
[8+8]

5. Write short notes on the following controls:
 - (a) Delayed Sweep
 - (b) ALT/ CHOP mode
 - (c) Astigmatism.
[4+8+4]

6. (a) Draw the circuit of a Hay bridge and derive an expression for the unknown inductance and show that it is preferred for the measurement of high Q coils.
(b) What are the sources of error in the measurement of Q of a coil. How are they taken care? [8+8]

7. (a) Explain the most common method of temperature compensation used in strain gauges.
(b) Explain the working of a magnetic flowmeter with a neat diagram.
[8+8]

8. (a) Define pressure? What are different methods of pressure measurement?
(b) Define the following terms:
 - i. Gauge pressure
 - ii. Absolute pressure
 - iii. Differential pressure.
[8+8]

IV B.Tech I Semester(R05) Regular & Supplementary Examinations, December 2009
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Electronics & Communications Engineering)

Time: 3 hours Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks



1. (a) Explain with a neat block diagram of a dual slope digital voltmeter.
(b) A dual slope integrating type of A/D converter has an integrating capacitor of 0.1 microfarad and a resistance of 100k.ohms connected. If the reference voltage is 2V, and the output of an integrator is not to exceed 10V, what is the maximum time reference voltage.[6+10]
2. (a) With the help of a block diagram explain the principle of operation of a function generator.
(b) With a neat diagram explain the working of an RF signal generator. [8+8]
3. (a) Draw the circuit diagram and explain the working of a super heterodyne type wave analyzer.
(b) Explain one application of distortion factor meter. [8+8]
4. (a) Explain with a block diagram the major parts of CRT.
(b) Explain the difference between the internal & external graticules. [8+8]
5. (a) What is an electronic counter? How can it be used for the measurement of the following:
 - i. Average time period mode
 - ii. Totalizing.
(b) What is trigger level errors and suggest the means to obtain the maximum accuracy? [10+6]
6. Define Quality factor? Derive the expression of Quality factor in Hay's bridge which is used for the measurement of unknown inductance?[16]
7. (a) Define a transducer? Explain various characteristics of an electrical transducer?
(b) What are the advantages and limitations of electrical transducer? [8+8]
8. Write short notes on:
 - (a) Electrical pressure transducers
 - (b) Capacitive pressure transducers. [8+8]

IV B.Tech I Semester(R05) Regular & Supplementary Examinations, December 2009
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Electronics & Communications Engineering)

Time: 3 hours Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks



1. (a) Explain the following terms:
 - i. Accuracy
 - ii. Error
 - iii. Linearity
 - iv. Precision.

(b) Discuss the main difference between accuracy and precision.

(c) Explain the operation of peak responding voltmeter. [8+4+4]
2. (a) What are the precautionary measures to be taken in a signal generator application?

(b) Discuss in detail about RF signal generators operation. [8+8]
3. (a) Draw and explain the block diagram of Multi filter real time Spectrum Analyzer.

(b) Explain the different types of distortions caused by an amplifier. [8+8]
4. (a) Draw the block diagram of vertical amplifier and explain its working.

(b) Draw the block diagram of dual-beam CRO and explain its working. [8+8]
5. (a) Explain the gear wheel method for frequency measurement.

(b) Compare storage oscilloscope with ordinary oscilloscope. [8+8]
6. (a) Derive an expression to balance in an Anderson's bridge. Draw the phasor diagram under balance conditions.

(b) List the advantages and disadvantages of Anderson's bridge. [10+6]
7. (a) Describe the operation of Infrared pyrometers.

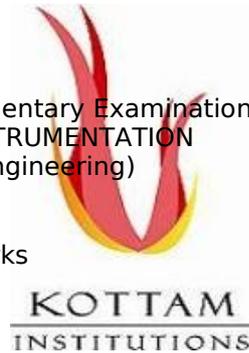
(b) Explain how the thickness of a sheet material can be measured? [8+8]
8. (a) Explain how an electrical transducer can be used to find the unknown pressure of a liquid?

(b) Briefly explain the principle and operation of piezoelectric accelerometer? [8+8]

IV B.Tech I Semester(R05) Regular & Supplementary Examinations, December 2009
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Electronics & Communications Engineering)

Time: 3 hours Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks



1. (a) How does a basic d'Arsonval movement converted into multi range volt meter. Explain it using a neat diagram.
(b) A basic d'Arsonval movement with an internal resistance $R_m = 50\Omega$ and full scale current $I_{fsd} = 0.5\text{mA}$ is to be connected to a multi range DC voltmeter with voltage ranges of 0-10V, 0-50V, 0-250V and 0-500V. Show the arrangement with the help of neat diagram with values of resistances used.
[8+8]
2. (a) Draw the block diagram of a function generator and explain its operation.
(b) With a neat diagram discuss the operation of a pulse generator. [8+8]
3. (a) Distinguish between a logic analyzer and a spectrum analyzer.
(b) With a neat block diagram, explain the principle of operation of a logic analyzer. Give an example.
[8+8]
4. (a) Briefly explain about Electrostatic Deflection of a CRT.
(b) Discuss about Screens of CRT.
(c) An input pulse V_i of 5 ns duration is applied to the basic sweep circuit using R and C at the instant V_o reaches 4.76V. What is the voltage across the capacitor after 50 μs if the saturated transistor presents a resistance of 0.2K Ω to the circuit?[6+5+5]
5. What is the need for attenuators? Briefly explain the compensated and uncompensated attenuators?
[16]
6. (a) What are the important features of a Kit type LCR bridge?
(b) Draw the circuit of a Wien bridge and derive an expression for the frequency.
[8+8]
7. (a) Differentiate the bonded resistance wire strain gauge and unbonded resistance wire strain gauge?
(b) Write short notes on the following terms:
 - i. Active transducers
 - ii. Passive transducers.[8+8]
8. (a) Define Force? With neat sketches Explain how force can be measured by means of Hydraulic Force Meter?
(b) List out the advantages and limitations of a Hydraulic Force Meter?
[10+6]