

Code No: 07A70402

**R07**

**Set No. 4**

IV B.Tech I Semester Examinations, MAY 2011  
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION  
Electronics And Communication Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
All Questions carry equal marks

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1. (a) Explain about Ammeter Loading effect.  
(b) Determine the Multiplier resistance on the 50V range of a DC voltmeter, which uses 300mA meter movement having internal resistance of  $1.2\Omega$ . [8+8]
2. How are passive Transducer classified? Give examples and explain the Principle of operation of each of the them. What are the Various physical Parameters that can be measured using them. [16]
3. (a) Draw the Wien Bridge and derive the expression for the frequency of excitation Signal at balance. What are the salient features of this bridge circuit?  
(b) Which type of Bridge Circuit is used to determine L having Q factor in the range of 1 to 10? Draw the circuit and derive the expression for the unknown inductance. [8+8]
4. (a) With the help of a block Schematic explain the principle and operation of a CRO.  
(b) Derive the expression for Electromagnetic Deflection Sensitivity of  $S_m$ . Compare this with CRT having Electrostatic Deflection Mechanism. [8+8]
5. (a) Explain the principle and working of a Dual Trace Oscilloscope.  
(b) Explain the method of measurement of period using CRO. [8+8]
6. What are the different sections of a frequency synthesized Signal Generator? Explain the function of each in waveform generation. [16]
7. (a) Draw the block Schematic of a Wave Analyzer and explain its working. what are the applications of Wave Analyzers?  
(b) Estimate the value of a minimum detectable signal (MDS) of a Spectrum analyzer with a NF of 25dB using 1KHz 3dB filter. [8+8]
8. (a) Explain the principle and working of ultrasonic Level gauge.  
(b) How Humidity and Moisture are measured? Explain. [8+8]

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1. Draw the Block Schematic of a Frequency counter and explain its principle and Working. [16]
2. (a) Explain the Principle and working of Strain gauges.  
(b) What are Strain gauges Rosettes? Explain.  
(c) What are the Salient features of Semiconductor Strain gauges? Explain. [6+4+6]
3. Draw the Sketch and explain the principle and operation of Hotwire Anemometer for fluid flow measurement. What are the two types of anemometer available for fluid flow measurement. [16]
4. (a) Explain the principle and working of Arbitrary waveform Generator Instrument.  
(b) Draw the Circuit for Hartley oscillator and explain the principle of operation. [8+8]
5. Draw the block Schematic of a Basic Spectrum Analyzer and explain its working? What are applications of this Instrument. [16]
6. (a) Explain the Principle and working of Ramp Type DVM  
(b) Give the specifications and Typical Values of a DVM. [8+8]
7. (a) Which type of Bridge Circuit is used to determine the Dissipated factor of a Capacitor? Draw the Circuit and derive the expression for the unknown elements.  
(b) Draw the Andersons Bridge Circuit and derive the expression for the unknown Elements. [8+8]
8. With the help of a block Schematic explain the functioning of a Dual Beam CRO. Compare this with single beam CRO. [16]

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Code No: 07A70402

**R07****Set No. 2**

IV B.Tech I Semester Examinations, December 2011  
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION  
Electronics And Communication Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
All Questions carry equal marks

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1. Draw the block Schematic for wideband sweep generator and explain its Working. [16]
2. Explain the Principle and working of Rotameter. What are the other types of area flow meters available? Critically compare them in all respects. [16]
3. (a) Explain the difference between an Analog Oscilloscope which can measure upto 100 MHz and Digital Storage Oscilloscope which can measure upto 100 MHz.  
(b) Explain the practical advantages of Digital Storage Oscilloscope. [8+8]
4. (a) Explain about different types of errors that can occur in measurements.  
(b) A Voltmeter having a Sensitivity of  $20k\Omega/V$  reads 100V units 150V scale, when connected across an unknown resistor  $R_x$ . The current passing through the resistor is 2.0mA. Calculate the % error to loading effect. [8+8]
5. (a) Explain the principle and working of Variable Area Capacitance Transducer.  
(b) What are the advantages of capacitance Transducers? What parameters can be measured with Capacitance Transducers? Explain. [8+8]
6. Draw the block Schematic of CRT and explain its working. What are the Possibilities and Limitations of improving Deflection Sensitivity of CRT? [16]
7. (a) Draw the Maxwell's Bridge Circuit and derive the expression for the unknown inductance  $L_x$ .  
(b) In the case of Maxwell's bridge, one arm has resistance of  $1K\Omega$ , in another arm has also only resistance of  $5K\Omega$ . The third arm has a resistor  $4-7k\Omega$  in shunt with a capacitor of  $1\mu F$ . The bridge is excited at frequency of 1KHz. Determine the Values of an unknown  $L_x$  in the fourth arm. [8+8]
8. Draw the block Schematic of Tunable selective type Harmonic Distortion Analyzer and explain its working. What are the advantages and disadvantages of those instruments? [16]

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**R07****Set No. 1**

IV B.Tech I Semester Examinations, December 2011  
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION  
Electronics And Communication Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
All Questions carry equal marks

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1. (a) In a video cable, a particular channel program is selected at 78.5 MHz. Explain how you measure its harmonics using Spectrum Analyzer. What are different harmonic frequencies for the above channel.  
(b) Explain the difference between Spectrum Analyzer and Digital Fourier Analyzer. [8+8]
2. (a) Explain about Static and Dynamic characteristics of Instruments.  
(b) What are the different types of Errors that occur in Measurements and explain how to reduce them? [8+8]
3. Draw the block schematic and explain the principle and working of Dual Beam CRO. [16]
4. Which type of Bridge Circuit is used to determine the Dissipation factor of a Capacitor? Draw the Circuit and derive the expression for the unknown elements. [16]
5. (a) Draw the block diagram of a Pulse Generator Instrument and explain the operation of the Instrument.  
(b) Determine the frequency of Collipitts oscillator with  $L = 100\text{mH}$ ,  $C_1 = 0.005\text{MF}$ ,  $C_2 = 0.01\text{MF}$ . [8+8]
6. Explain the principle and working of a storage oscilloscope and compare it with normal CRO. [16]
7. Explain about different methods available for Liquid Level measurement and Compare them in all respects. [16]
8. (a) Explain about Piezoelectric effect, and the materials exhibiting this effect  
(b) Define Various Piezoelectric coefficients, and explain about them. [8+8]

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Code No: 09A50406

**R09**

**Set No. 4**

III B.Tech I Semester Examinations, December 2011  
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION  
Electronics And Communication Engineering

Time: 3 hours

Max Marks: 75

Answer any FIVE Questions  
All Questions carry equal marks

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1. (a) Draw the block schematic of electronic telemetry instrumentation system and explain the same.  
(b) What are the objectives of measurement? Explain.  
(c) What are the advantages of Instrumentation System? Explain. [7+4+4]
2. (a) Derive the expression for the output voltage in the case of feedback type capacitance transducer and show that it is proportional to displacement.  
(b) What are the advantages of Capacitance Transducers? [8+7]
3. Draw the block schematic of a sampling oscilloscope and explain its functioning. [15]
4. (a) Draw the block schematic of a CRO and explain its functioning.  
(b) Derive the expression for electromagnetic deflection sensitivity of a CRT and explain about the design criteria, to improve  $S_M$ . [7+8]
5. (a) Explain the principle of working and materials used in the case of resistance thermometers.  
(b) What are the advantages and disadvantages of wire resistance thermometers. [7+8]
6. (a) Draw the block schematic of a sweep frequency generator and explain its working.  
(b) Give the specifications and typical values of AM/FM signal generators. [7+8]
7. (a) Draw the block schematic of a Low-Frequency Spectrum Analyser and explain its principle and working.  
(b) What are the applications of low frequency spectrum analysers? Explain. [9+6]
8. (a) Which type of bridge circuit is used to measure the coils with Q factor lying in the range 1 to 10. Draw the circuit and derive the expressions for unknown elements at balance.  
(b) Compare AC and DC bridges in all respects. [9+6]

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Code No: 09A50406

**R09**

**Set No. 3**

III B.Tech I Semester Examinations, December 2011  
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION  
Electronics And Communication Engineering

Time: 3 hours

Max Marks: 75

Answer any FIVE Questions  
All Questions carry equal marks

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1. (a) Give the schematic of a strip-chart recorder and explain its working.  
(b) Give the specifications and typical values of X-T recorder. [7+8]
2. Explain how different lissajous figures can be used to measure various parameters? Derive the necessary mathematical equations for each of the Lissajous figures mentioned. [15]
3. (a) Draw the block schematic of a data process instrumentation system and explain the same.  
(b) Compare analog and digital instruments in all respects. [7+8]
4. Draw the block schematic of a Spectrum Analyser and explain its principle and working. [15]
5. (a) What are the different types of instruments available for pressure measurements and the ranges of pressures over which they can be used.  
(b) Explain the principle and working of Ionisation gauge. [8+7]
6. (a) Explain Piezoelectric effect and different materials exhibiting this effect.  
(b) Draw the equivalent circuit for a Piezoelectric Transducer and derive the expression for the transfer function. [8+7]
7. Explain the principle, working and applications of Arbitrary waveform generators and Video Signal generators. [15]
8. (a) What are the limitations of Wheatstone bridge circuit? How can they be minimized? Explain.  
(b) In a certain Wheatstone bridge circuit measurements,  $R_A=200k\Omega$ ,  $R_B=400k\Omega$ ,  $R_C=100k\Omega$ ,  $R_D=300k\Omega$ .  $E=1.5V$ ,  $R_g=100\Omega$ , with usual notation. Determine the current through the detector galvanometer. [7+8]

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Code No: 09A71702

R09

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B. Tech IV Year I Semester Examinations, November/December-2012

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

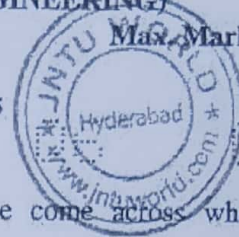
(ELECTRONICS AND TELEMATICS ENGINEERING)

Time: 3 hours

Max. Marks: 75

Answer any five questions

All questions carry equal marks



- 1.a) Explain in detail the different types of errors we come across when any measurement is done and how they can be minimized.
- b) Explain the working of true RMS responding voltmeters with circuit diagram. [8+7]
- 2.a) With an example explain the working of successive approximation DVM.
- b) With a neat diagram explain the operation of pulse generator and mention the modifications to be done in the circuit to convert it into a square wave generator. [8+7]
- 3) With relevant sketches describe the operation of Harmonic Distortion analyser. List all the applications of the same. [15]
- 4.a) Explain the construction of an AC bridge and derive the expression for unknown capacitance.
- b) A sample of Bakelite was tested by schering bridge method at 11kV, 50Hz. 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  $\mu$ F.  
Arm CD: a capacitor of 0.6  $\mu$ 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. [7+8]
- 5.a) What effect does increasing the writing rate of a CRO, by increasing the accelerating potential have on the deflection sensitivity.
- b) What is the minimum distance L, that will allow full deflection of 4 cm at the CRT screen, with a deflection factor of 100 V/cm and with an accelerating potential of 2000 V. [10+5]
- 6.a) What do you mean by multi-trace w.r.t. to oscilloscopes?
- b) With a neat block diagram explain each block of a dual trace oscilloscope. [5+10]
- 7) Write short notes on:  
a) strain gauges      b) LVDT      c) Anemometers. [5x3=15]
- 8.a) With a neat diagram and relevant expressions explain electromagnetic flow meter.
- b) Taking a specific transducer explain how liquid level can be measured using non contact method. [10+5]

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R07

Code No: 07A70402

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B. Tech IV Year I Semester Examinations, November/December-2012

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION  
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 hours

Max. Marks: 80

Answer any five questions  
All questions carry equal marks



1.a) Explain the terms:

- i) Significant figures
- ii) Conformity.

b) Define the sensitivity of a multimeter. Draw the block diagram of a simple multimeter and explain its operation. [16]

2.a) With a neat diagram explain the working of an RF signal generator.

b) Discuss about how random noise problems are overcome in function/signal generators. [16]

3.a) Explain the working of the harmonic distortion analyzer.

b) List out the applications of Spectrum analyzer. [16]

4.a) Explain about Electrostatic Deflection Mechanism and derive the expression for Electrostatic Deflection Sensitivity.

b) Discuss the timing relations and CRT displays of four common sweep modes. [16]

5.a) Draw the block Diagram of a Dual Trace CRO and explain it.

b) Explain the working of a compensated 10X probe. [16]

6.a) A Maxwell bridge is used to measure inductive impedance at a frequency of 3 kHz. The bridge constants at balance are arm 1: a capacitor of value  $0.02 \mu F$  in shunt with  $280 k\Omega$ ; arm 3 opposite to the arm 1 is having the unknown component; the other arms have each  $25 k\Omega$  resistor. Find the equivalent series circuit of the unknown impedance. What is the value of the quality factor?

b) What is the significance of Wagners' ground connection? [16]

7.a) With the help of a neat sketch explain working principle, characteristics and applications of LVDTs.

b) Describe the construction details and Limitations of thermocouples. [16]

8.a) How Humidity and Moisture are measured?

b) Explain the characteristics of Data loggers. [16]

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R09

Code No: 09A50406

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD**

**B. Tech III Year I Semester Examinations, May/June – 2013**

**Electronic Measurements and Instrumentation  
(Electronics and Communications Engineering)**

**Time: 3 hours**

**Max. Marks: 75**

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

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- 1.a) Define the terms Accuracy, Error, Precision, Resolution, Expected value and Sensitivity.
- b) What is the difference between secondary standards and working standards?
- c) Explain the working of a true value RMS voltmeter. [15]
2. Explain with the help of neat circuit diagram the working of dual slope DVM. [15]
- 3.a) How broad band sweep frequencies generated using a sweep generator?
- b) List the various controls on the front panel of the pulse generator and mention their uses. [15]
4. Draw the circuit diagram and explain the working of a heterodyne type wave analyzer. [15]
- 5.a) Derive the criterion for balance of a Kelvin's bridge.
- b) Describe the operation of the Wheat stone bridge with neat circuit diagram. [15]
6. Explain in-detail the principle, construction and operation a single beam CRO, with a neat diagram. [15]
- 7.a) Explain the operating principles of LVDT.
- b) Explain the construction and operation of strain gauge system for the measurement of force.
- c) What is the difference between thermocouple and thermistor? [15]
- 8.a) Compare a magnetic flow meter. With turbine flow meter
- b) What is the operating principle of a better gauge?
- c) Explain the operation of optical pyrometer. [15]

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