

Code No: 07A70402

R07**Set No. 2**

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

1. (a) Explain the front panel of Digital storage Oscilloscope.
 (b) For a communication lab, signals upto 2 GHz are considered. Explain different specifications you consider for CRO selection. [8+8]
2. Draw the sketches of elastic Transducers and explain how they are used to measure pressure. [16]
3. Explain the Principle , working , Construction, characteristics and applications of Thermistors. [16]
4. Draw the Schematic for Pulse and Square wave generator and explain the Principle of operation. [16]
5. (a) Draw the Ayrton Shunt Circuit and explain how current measurement is done?
 (b) It is desired to extend the range of a 10mA Ammeter with $R_m = 100 \Omega$ to measure 15A. Draw the circuit and determine the value of R. [8+8]
6. Draw the Circuit and explain the principle and working of Tuned circuit Harmonic Analyzer. [16]
7. (a) Draw the circuit for Schering Bridge and derive the expression for unknown Capacitance C_x .
 (b) In the case of a Schering Bridge, arm AC has $R=4.7k\Omega$. Arm CD has unknown elements . Arm BD has $C=0.1MF$ Arm AB= $4.7K\Omega$ is shunt with 1MF. Determine Values of components in the arm CD. [8+8]
8. (a) By Lissajous pattern method , explain how the Phase difference between two Sinusoidal Signals can be measured.
 (b) Give the specifications with Typical values of a CRO. [8+8]

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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

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 1.2Ω . [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 Analyzes ?
 (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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R07**Set No. 1**

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

1. (a) Draw the block Schematic of CRO and explain its working.
 (b) Derive the expression for electrostatic deflection sensitivity S_E of a CRO. [8+8]
2. (a) What is wave analyzer?
 (b) What is the role of active filter heterodyne wave analyzer?
 (c) What are the limitations of frequency spectrum analyzer? [4+6+6]
3. Draw the Block Schematic of a Period Measuring Instrument and explain its Principle and working. [16]
4. With the help of a neat sketch explain the principle , working , construction, characteristics and applications of LVDTs. [16]
5. (a) Balancing of which type of Bridge circuits AC or DC is difficult ? Why?
 (b) Draw the circuit for Schering bridge and derive the expression for unknown elements. [8+8]
6. Explain the principle of Elastic Force Device and other Electro mechanical Methods for force measurement . [16]
7. (a) Explain about different types of errors that occur in measurements. How they can be Minimized ?
 (b) A Voltmeter having a sensitivity of $15\text{k}\Omega/\text{V}$ reads 80V on a 100V scale , when connected across an unknown resistor. The current through the resistor is 2mA. Calculate the % of error due to loading effect . [8+8]
8. (a) Explain the Principle and working of a Function Generator.
 (b) Give the Specifications and Typical Values of a Function Generator Instrument. [8+8]

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R07**Set No. 3**

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

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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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

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 $20\text{k}\Omega/\text{V}$ reads 100V units 150V scale, when connected across an unknown resistor Rx. 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 $1\text{k}\Omega$, in another arm has also only resistance of $5\text{k}\Omega$. The third arm has a resistor $4-7\text{k}\Omega$ in shunt with a capacitor of $1\mu\text{F}$. 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. 4**

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

1. Explain the principle and working of Ultrasonic Flow meters. Compare this with other types of flow measurements. [16]
2. Draw the Schematic of wave meter and explain its principle of operation. [16]
3. (a) Explain the constructional details and difference between Ohmmeter series type and shunt type.
 (b) Explain the front panel of a multimeter. Suppose if we are measuring a voltage 230V AC. What should be the voltage range we select. [8+8]
4. (a) Explain the Principle and working of Thermistors. Describe functional Features.
 (b) A thermistor has a temperature coefficient of resistance of - 0.05 over a temperature range of 25⁰ to 50⁰C. Determine the resistance of Thermistor at 50⁰C, if R at 25⁰C is 130Ω. [10+6]
5. (a) Draw the sketch of a CRT and explain its operation in detail.
 (b) Determine detection sensitivity of a CRO, given that with usual notation, $l = 2.5\text{cm}$, $L = 20\text{cm}$, $d = 2.5\text{ mm}$, $V_d = 5\text{V}$ & $V_a = 2000\text{V}$. [8+8]
6. Which type of Bridge Circuit is used for coils having $Q > 10$? Draw the Circuit and derive the expression for the unknown inductance. [16]
7. (a) Explain the Principle and working of FM Signal Generator.
 (b) Give the specifications and Typical values of FM signal Generator. [8+8]
8. Explain the Principle of Frequency and Period measurement when do you prefer Frequency measurement over period measurement. Explain. [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

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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R07**Set No. 3**

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

1. Explain the Principle and working of Platinum Resistance Thermometer for Temperature Measurements. Compare this with other types of methods available for Temperature measurement. [16]
2. What are the different types of probes used for CROS. Explain about each of them. [16]
3. (a) Draw the Maxwells bridge Circuit and derive the expression for the unknown Elements at balance.
 (b) Draw the Wien Bridge Circuit and derive expression for the frequency at which The bridge elements are balanced. [8+8]
4. How are spectrum Analyzers classified ? Draw the block Schematic of a general Purpose spectrum Analyzer and explain the principle of operation. [16]
5. (a) Explain about Delay lines in CROs.
 (b) Determine the deflection sensitivity of a CRO, given with usual notation, $l = 2\text{cm}$; $d = 4.5\text{mm}$; $L = 20\text{cm}$; $V_a = 3200\text{V}$. [8+8]
6. (a) How Function Generator Instrument is different from signal Generator? Draw the block schematic and explain the principle of function Generator Instrument.
 (b) Determine the oscillator frequency of a Hartley oscillator with $L_1 = 100\text{mH}$, $L_2 = 1\text{mH}$, $M = 50\text{mH}$ and $c = 100\text{pf}$. [10+6]
7. Draw the Ballast and Wheat Stone Bridge Circuits employed for Strain gauge and Derive the expression for the output Voltage e_o . [16]
8. (a) Draw the sketch of PMMC movement and explain its principle of working with the help of equations.
 (b) What are the different suspension mechanisms employed in moving coil instruments? Explain with the help of necessary sketches. [8+8]

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

1. Draw the Similar angle bridge circuit and derive the expressions for the unknown element R_x and C_x . Why it is named so? [15]
2. How are passive transducers classified? Explain the principle of those transducers briefly. [15]
3. Write notes on:
 - (a) Lissajous figures
 - (b) Delay lines. [15]
4. (a) When do you prefer period measurement over frequency measurement? Explain.
(b) Draw the block schematic of Period measuring instrument and explain its working. [7+8]
5. (a) Using necessary equations and sketches, explain the principle and working of Ultrasonic flowmeter.
(b) What are the advantages and applications of Ultrasonic flowmeters? [8+7]
6. In which type of DVM, the measurement accuracy is independent of tolerance of Resistor and capacitor tolerance? Explain its principle and working with the help of block diagrams. [15]
7. (a) What are the factors to be considered in choosing a Spectrum Analyser instrument? Explain.
(b) What are the applications of Spectrum Analysers? Explain. [7+8]
8. Explain about the following terms pertaining to Instrumentation system, giving examples.
 - (a) Accuracy
 - (b) Precision
 - (c) Sensitivity
 - (d) Resolution
 - (e) Repeatability
 - (f) Reproducibility. [15]

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

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]

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

1. What is the significance of Wagners' ground connection? With help of a circuit, explain the same [15]
2. Explain Piezoelectric effect. What are the applications of the same for measurement purpose? Deduce the relationship between different Piezoelectric coefficients. draw the equivalent circuit of a Piezoelectric transducer and derive the expression for the output voltage. [15]
3. (a) Explain the principle and working of Constant Temperature Type Hotwire anemometer.
(b) Draw the bridge circuit for Constant Temperature Type Hotwire anemometer and explain how measurements are made. [8+7]
4. What are the salient features of Dual slope Integrating type DVM? Explain its principle and operation. [15]
5. Write notes on
 - (a) Power Analysers
 - (b) C-V Meters. [7+8]
6. What are Lissajous figures? How are they produced? What are the applications of the same? Derive the necessary mathematical expressions to prove the shapes of lissajous figures. [15]
7. (a) Explain the principle and working of Digital storage oscilloscope.
(b) Determine the secondary emission ratio 'S' of a digital storage oscilloscope, if the value secondary emission current I_S is $15\mu A$, and the primary beam current I_P is $150\mu A$. [11+4]
8. (a) With the help of neat sketch, explain the PMMC movement in measuring instruments.
(b) Determine the Torque developed in a PMMC movement, given $B = 0.5$ Tesla, $N = 80$ Turns, Area of the coil $A = 1.5\text{ cm}^2$ and current through the coil I is 10mA . [7+8]

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

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]

Code No: 09A71702

R09

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

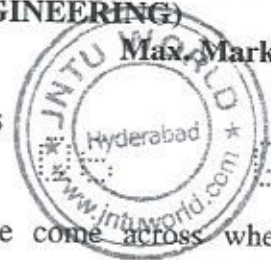
B. Tech IV. Year I Semester Examinations, November/December-2012

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 $100 \mu\text{F}$.

Arm CD: a capacitor of $0.6 \mu\text{F}$ in parallel with a non reactive resistance of 300Ω .

Arm DA: a non reactive resistor of 100Ω .

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

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]

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**

- 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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R07**Set No. 2**

IV B.Tech I Semester Examinations, May/June 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 function of an isolation amplifier in signal generator.
(b) How to overcome the problem of varying output voltage from the oscillator of sine wave generator
(c) How the piston attenuator is used in sine wave generator? [6+5+5]
2. Draw the Schematic of wave meter and explain its principle of operation. [16]
3. (a) Explain Electro static deflection in CRO's.
(b) Draw the waveforms for horizontal and vertical deflection. [8+8]
4. (a) Compare AC Bridge circuit with DC Bridge circuits.
(b) Draw the circuit for Maxwell's bridge and derive the expression for the unknown element. [8+8]
5. Draw the Circuit and explain the principle and working of Ionization gauge, Compare this with Piraniguage in all respects. [16]
6. Draw the Circuit for Feed back type Capacitance pickup transducer and derive The expression for output Voltage e_o . What are the advantages and Limitation of this circuit? [16]
7. (a) Draw the block Schematic of a frequency counter and explain its principle of Operation.
(b) How do you extend the range of a frequency counter? Explain. [8+8]
8. (a) Draw the block Schematic of Staircase Ramp Type DVM and explain the Principle of working.
(b) Draw the circuit and explain how auto ranging is provided in Digital Multi meter. [8+8]

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R07**Set No. 4**

IV B.Tech I Semester Examinations, May/June 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. With the help of a neat sketch explain the principle and working of Constant Current type Hotwire Anemometer. What are the applications and limitations of this type of Instrument? [16]
2. Draw the block schematic and explain the principle and working of Dual Beam CRO. [16]
3. (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]
4. (a) What are the different Types of signal Generators? Explain each of them briefly.
(b) What are the considerations to be made in choosing an oscillator Instrument or Signal Generator Instrument? [8+8]
5. (a) Explain the Principle and working of Thermistors. Describe functional Features.
(b) A thermistor has a temperature coefficient of resistance of - 0.05 over a temperature range of 25^o to 50^oC. Determine the resistance of Thermistor at 50^oC, if R at 25^oC is 130Ω. [10+6]
6. (a) What are various advantages of Instrumentation systems?
(b) Give the block schematic of a general measuring system and explain the same.
(c) What are the objectives of measurement? Explain.
(d) A 4½ digit DVM can measure 199.99V. Determine the resolution in Volts. [4+4+4+4]
7. Compare Maxwell's Anderson, Schering and Wien Bridge Circuits in all Elements. [16]
8. (a) Explain how Lissajous patterns of Ellipse and circle are formed. Derive necessary equations to prove the same.
(b) A Lissajous patterns on a CRO has Six Vertical maximum Values and Five horizontal maximum Values. The frequency of the horizontal input is 1500Hz. Determine the frequency of the Vertical input. [8+8]

Code No: 07A70402

R07

Set No. 4

JNTUWORLD

Code No: 07A70402

R07**Set No. 1**

IV B.Tech I Semester Examinations, May/June 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. How are Lissajous figures formed on CRO screen ? Explain about different patterns, that can be formed on CRO's and derive the mathematical equation in each case. [16]
2. (a) For a particular DC voltmeter given with central range. If required explain how a range extension can be done.
 (b) For a measuring Instruments what factors contribute for deviation from the expected value. Explain. [8+8]
3. (a) Explain different types of CRO Probes. Also explain the precautions to be taken while using CRO Probes.
 (b) Explain the importance of CRO's in communication lab. [8+8]
4. (a) Explain the principle of thermocouples. What are the different types of thermo Couples used?
 (b) Explain the Principle and working of LVDT. [8+8]
5. (a) What are the Possible Sources of errors in Bridge Circuit measurements? How can they be eliminated?
 (b) Draw any Bridge Circuit to determine the unknown Capacitance and derive the expression for the unknown elements. [8+8]
6. (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]
7. Explain the principle of a general Spectrum Analyzer. What are the applications of this Instrument? What are the factors to be considered in the Selection of Spectrum Analyzer? [16]
8. (a) Explain the principle and working of Proximity Detector.
 (b) How are Humidity and Moisture measured? Explain. [8+8]

Code No: 07A70402

R07**Set No. 3**

IV B.Tech I Semester Examinations, May/June 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) Give the block Schematic for an electronic Voltmeter and explain its operation.
(b) Draw the circuit and explain the working of Peak reading, Peak-to-Peak reading and Average reading Voltmeters. [8+8]
2. (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]
3. Explain the Principle and working of Rotameter. What are the other types of area flow meters available? Critically compare them in all respects. [16]
4. (a) Draw the block Schematic of a frequency synthesized Signal generators, and explain the function of each block.
(b) Draw the circuit and explain about the alternator used in signal generators, considering parasitic reactances. [8+8]
5. How are spectrum Analyzers classified ? Draw the block Schematic of a general purpose spectrum Analyzer and explain the principle of operation. [16]
6. 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]
7. (a) Explain the principle and working of a potentiometer Transducer.
(b) Derive the expression for Maximum % error due to loading effect in the case of Potentiometer Transducer. [8+8]
8. (a) Derive the expression for electrostatic deflection sensitivity S_E of a CRO.
(b) What are the different Phosphors used for screens? Explain about them. [8+8]

Code.No: NR310401

NR

SET-1

**III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
ELECTRONICS MEASUREMENT & INSTRUMENTATION
(ELECTRONICS & COMMUNICATIONS ENGINEERING)**

Time: 3hours**Max.Marks:80**

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

- - -

- 1.a) What are the various types of errors? Explain [8+8]
b) Explain various methods that are available to minimize and eliminate errors.
- 2.a) Explain the available types of distortion. What is meant by distortion? [8+8]
b) With a neat circuit diagram explain a programmable decode synthesizer.
- 3.a) Derive the following [8+8]
i) Condition for bridge balancing
ii) Criterion for balance of a wheat stone bridge.
b) Kelvin bridge is called modified wheat stone bridge. Justify your answer.
- 4.a) Explain the method employed for the measurement of θ of [8+8]
i) High impedance components
ii) Low impedance components
b) Explain the measurement of resistance of a coil using a θ meter.
- 5.a) Explain the main components of CRT with a neat sketch. [8+8]
b) Explain briefly the basic operation of a general purpose oscilloscope with a neat block diagram.
- 6.a) Explain various blocks of a spectrum analyzer of the swept receiver design with a neat diagram. [10+6]
b) Mention all the applications of spectrum analyzer.
7. Explain briefly the working of [16]
(i) Resistive transducers (ii) Capacitive transducers
(iii) Inductive transducers and give two applications for each.
- 8.a) Define and explain briefly about the operating principle of an LVDT. What are its applications?
b) Discuss the advantages and disadvantages of LVDT. [8+8]

Code.No: NR310401

NR

SET-2

**III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
ELECTRONICS MEASUREMENT & INSTRUMENTATION
(ELECTRONICS & COMMUNICATIONS ENGINEERING)**

Time: 3hours**Max.Marks:80**

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

- - -

- 1.a) Derive the following [8+8]
 i) Condition for bridge balancing
 ii) Criterion for balance of a wheat stone bridge.
 b) Kelvin bridge is called modified wheat stone bridge. Justify your answer.
- 2.a) Explain the method employed for the measurement of θ of [8+8]
 i) High impedance components
 ii) Low impedance components
 c) Explain the measurement of resistance of a coil using a θ meter.
- 3.a) Explain the main components of CRT with a neat sketch. [8+8]
 b) Explain briefly the basic operation of a general purpose oscilloscope with a neat block diagram.
- 4.a) Explain various blocks of a spectrum analyzer of the swept receiver design with a neat diagram. [10+6]
 b) Mention all the applications of spectrum analyzer.
5. Explain briefly the working of [16]
 (i) Resistive transducers (ii) Capacitive transducers
 (iii) Inductive transducers and give two applications for each.
- 6.a) Define and explain briefly about the operating principle of an LVDT. What are its applications?
 b) Discuss the advantages and disadvantages of LVDT. [8+8]
- 7.a) What are the various types of errors? Explain [8+8]
 b) Explain various methods that are available to minimize and eliminate errors.
- 8.a) Explain the available types of distortion. What is meant by distortion? [8+8]
 b) With a neat circuit diagram explain a programmable decode synthesizer.

Code.No: NR310401

NR

SET-3

**III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
ELECTRONICS MEASUREMENT & INSTRUMENTATION
(ELECTRONICS & COMMUNICATIONS ENGINEERING)**

Time: 3hours**Max.Marks:80**

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

- - -

- 1.a) Explain the main components of CRT with a neat sketch. [8+8]
- b) Explain briefly the basic operation of a general purpose oscilloscope with a neat block diagram.
- 2.a) Explain various blocks of a spectrum analyzer of the swept receiver design with a neat diagram. [10+6]
- b) Mention all the applications of spectrum analyzer.
3. Explain briefly the working of [16]
 - (i) Resistive transducers
 - (ii) Capacitive transducers
 - (iii) Inductive transducers and give two applications for each.
- 4.a) Define and explain briefly about the operating principle of an LVDT. What are its applications?
- b) Discuss the advantages and disadvantages of LVDT. [8+8]
- 5.a) What are the various types of errors? Explain [8+8]
- b) Explain various methods that are available to minimize and eliminate errors.
- 6.a) Explain the available types of distortion. What is meant by distortion? [8+8]
- b) With a neat circuit diagram explain a programmable decode synthesizer.
- 7.a) Derive the following [8+8]
 - i) Condition for bridge balancing
 - ii) Criterion for balance of a wheat stone bridge.
- b) Kelvin bridge is called modified wheat stone bridge. Justify your answer.
- 8.a) Explain the method employed for the measurement of θ of [8+8]
 - i) High impedance components
 - ii) Low impedance components
- d) Explain the measurement of resistance of a coil using a θ meter.

Code.No: NR310401

NR

SET-4

**III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
ELECTRONICS MEASUREMENT & INSTRUMENTATION
(ELECTRONICS & COMMUNICATIONS ENGINEERING)**

Time: 3hours**Max.Marks:80**

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

- - -

1. Explain briefly the working of [16]
 - (i) Resistive transducers
 - (ii) Capacitive transducers
 - (iii) Inductive transducers and give two applications for each.

- 2.a) Define and explain briefly about the operating principle of an LVDT. What are its applications?
 - b) Discuss the advantages and disadvantages of LVDT. [8+8]

- 3.a) What are the various types of errors? Explain [8+8]
 - b) Explain various methods that are available to minimize and eliminate errors.

- 4.a) Explain the available types of distortion. What is meant by distortion? [8+8]
 - b) With a neat circuit diagram explain a programmable decode synthesizer.

- 5.a) Derive the following [8+8]
 - i) Condition for bridge balancing
 - ii) Criterion for balance of a wheat stone bridge.
 - b) Kelvin bridge is called modified wheat stone bridge. Justify your answer.

- 6.a) Explain the method employed for the measurement of θ of [8+8]
 - i) High impedance components
 - ii) Low impedance components
 - e) Explain the measurement of resistance of a coil using a θ meter.

- 7.a) Explain the main components of CRT with a neat sketch. [8+8]
 - b) Explain briefly the basic operation of a general purpose oscilloscope with a neat block diagram.

- 8.a) Explain various blocks of a spectrum analyzer of the swept receiver design with a neat diagram. [10+6]
 - b) Mention all the applications of spectrum analyzer.

Code No: K1924

R07

Set No. 1

IV B.Tech. II Semester Regular Examinations, April, 2011
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Electronics & Computer Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain the terms Accuracy, Sensitivity, and Resolution as used for indicating instruments.
b) A basic D'Arsonval movement with a full scale deflection of $100 \mu\text{A}$ and an internal resistance of 2000Ω is available. It is to be Converted into a 0-5V , 0-10V, 0-25V, and 0-50V multi range voltmeter using individual multipliers for each range. Calculate the values of the individual resistors.
2. Explain the working of a function generator producing sine , square and triangle waveforms. Draw its block diagram.
3. a) What do you understand by total harmonic distortion ?
b) With a neat sketch explain the operation of a fundamental suppression harmonic distortion analyzer.
4. a) Describe the function of each of the following oscilloscope controls
i)Focus ii)Astigmatism iii) Intensity IV) Sweep
b) Draw the block diagram of a basic oscilloscope and explain each block.
5. a) Describe the function of attenuators in CROs
b) With a block diagram explain the operation of a sampling oscilloscope.

Code No: K1924

R07

Set No. 1

6. a) Explain various null detectors used in dc bridges
b) Draw the circuit diagram of Anderson bridge and derive the equations for unknown variables.

7. a) What is the difference between active and passive transducers?
b) With a neat diagram explain the operation of a Piezo electric transducer.

8. a) Explain how humidity is measured?
b) What are the various configurations used in a DAS?

Code No: K1924

R07

Set No. 2

IV B.Tech. II Semester Regular Examinations, April, 2011
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Electronics & Computer Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain the different types of errors that may occur in measurements? Describe their sources
b) A basic D'Arsonval movement with a full scale deflection of $50 \mu\text{A}$ and an internal resistance of 200Ω is available. It is to be Converted into a 0-1mA , 0-10mA, 0-25mA, and 0-50mA multi range ammeter using individual shunts for each range. Calculate the values of the individual resistors
2. What is the function of a sweep function generator used in a CRO ? Explain with a block diagram a simple sweep generator.
3. What is a wave analyzer? Explain the working of
 - a) frequency selective and
 - b) ii)Heterodyne wave analyzer
4. a) Write short notes on the synchronization of the sweep
b) Draw the block diagram of a basic horizontal deflection section and explain each and every block.
5. a) Describe the procedure of frequency and time period measurement with the help of an oscilloscope
b) Explain how the frequency is measured using a frequency counter.

Code No: K1924

R07

Set No. 2

6. a) Explain the principle of Q-meter
b) Draw the circuit diagram of Hay's bridge and derive the equations for unknown variables.
7. a) Define gauge factor of a strain gauge and derive the expression for it.
b) Explain the working principle of resistance thermometers.
8. a) What are the main elements of velocity transducer?
b) Explain how an LVDT can be used to measure the displacement.

Code No: K1924

R07

Set No. 3

IV B.Tech. II Semester Regular Examinations, April, 2011
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Electronics & Computer Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Give the meanings of the following terms:
i) Precision ii) Probable error iii) Fidelity iv) lag
b) Differentiate between a series type ohmmeter and a shunt type ohmmeter.
2. a) What are the main considerations which are to be kept in view while selecting an oscillator for a particular applications?
b) With a block diagram explain the operation of AF sine and square wave generator.
3. a) Explain with the help of block diagram the operation of a Spectrum Analyzer.
b) Explain the following terms associated with Spectrum Analyzer:
i). Sensitivity
ii). Dynamic Range
iii). Harmonic Mixing
4. a) With a block diagram explain the operation of a dual beam oscilloscope.
b) Explain various delay lines used in CROs.
5. a) With a block diagram explain the operation of a digital storage oscilloscope.
b) Explain how the time period is measured using a frequency counter.

Code No: K1924

R07

Set No. 3

6. a) Draw the circuit diagram of Wien bridge and derive the equation for frequency
b) Write short notes on X-Y plotters.
7. a) Explain the operation of optical pyrometers.
b) Explain the principle of operation of differential pressure type flow meters.
8. a) Explain how an LVDT can be used to measure the pressure
b) Draw the block diagram of a standard DAS and explain function of each block.

Code No: K1924

R07

Set No. 4

IV B.Tech. II Semester Regular Examinations, April, 2011
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Electronics & Computer Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) What are the effects of using a voltmeter of low sensitivity? Explain with an example.
b) How would you extend the range of dc Voltmeters? Explain with suitable diagrams.
2. a) State and explain the condition for generating sustained oscillations.
b) With a block diagram explain the operation of random noise generator.
3. a) State the applications of a spectrum analyzer.
b) Explain the operation of digital Fourier analyzers.
4. a) Describe the function of each of the following oscilloscope controls
i) Focus ii) Astigmatism iii) Intensity iv) Sweep
b) With a block diagram explain the operation of a dual beam oscilloscope
5. a) With a block diagram explain the operation of a digital storage oscilloscope
b) Explain about the different probes used in CROs.
6. a) Draw the circuit diagram of Maxwell's bridge and derive the equations for unknown variables.
b) Why is Wagner's additional ground connection made?
7. a) Explain the working principle of thermocouple
b) Explain the construction and working of strain gauge.
8. a) Explain how an LVDT can be used to measure the displacement.
b) What are the important factors that decide the configuration and sub system of a DAS?



DEPARTMENT OF ELECTRONICS AND COMMUNICATION
ENGINEERING
QUESTION BANK

SUB.NAME : MEASUREMENTS AND INSTRUMENTATION

BRANCH : ECE

**STAFF NAME: Ms.R. POONGODI /
Mr.T. JEYASEELAN**

YEAR : III

SEMESTER : VI

UNIT-I

BASIC MEASUREMENT CONCEPTS

PART-A

1. What is meant by sensitivity?
2. Define accuracy and resolution.
3. What is meant by error? Classify.
4. What is meant by static and dynamic characteristics?
5. What is meant by Standard and list out its types?
6. What is the need for measurement and what are its types?
7. Write the need for Calibration.
8. Bring out the difference between moving coil and moving iron instruments.
9. What is the function of manipulation element in a measurement system?
10. What are Primary standards? Where are they used.?
11. What is PMMC meter and why PMMC instruments are not used for AC measurements?
12. What is a transfer instrument?
13. What is meant by true RMS meter?
14. List the types of DC and AC bridges?

15. How are instruments classified?
16. What is an absolute instrument? Give examples
17. What is a secondary instrument? Give examples.
19. List the advantages and disadvantages of PMMC meter.
20. Why MI instruments can be used on both AC and DC?
21. What are the errors that occur in MI instruments?

PART-B

1. (i) With a neat diagram explain in detail the Construction of a PMMC instrument. (8)
(ii) How do you measure large currents in PMMC instruments? (4)
(iii) What is Aryton Shunt? (4)
2. (i) Discuss in detail about Kelvin double bridge. (8)
(ii) With a neat diagram explain in detail about Hay Bridge. (8)
3. Explain static and dynamic characteristics of Measurement systems (16)
4. With the neat diagram explain Anderson Bridge and Schering Bridge. (16)
5. What are the functional elements of generalized instrumentation systems (16)
6. (i) Explain types of error in measurement and instrumentation systems. (8)
(ii) Explain units and standards. (8)
7. Explain True RMS meter. (16)

UNIT-II

BASIC ELECTRONIC MEASUREMENTS

PART A

1. What are the main parts of a CRO?
2. What is the purpose of time base circuit in a CRO?
3. What are the main parts of a Cathode Ray Tube (CRT)?
4. What is the function of an electron gun?
5. Define deflection sensitivity.
6. What is the purpose of delay line in a CRO?
7. List out some applications of CRO.
8. What is dual-beam and dual-trace CRO?
9. Distinguish between analog and digital storage oscilloscopes.
10. What are the different types of probes that are used in a CRO?
11. What is the principle of digital storage oscilloscope?

12. What is sampling oscilloscope?
13. What is Q factor?
14. What is Q meter?
15. What are the applications of Q meter?
16. What are the different connections in Q meter?
17. What is electronic multimeter?
18. What is vector impedance meter?

PART-B

1. Explain the working principle of a vector voltmeter with the help of a neat block diagram. (16)
2. Write brief notes on:
 - (i) Digital Storage Oscilloscope (8)
 - (ii) Sampling Oscilloscope (8)
3. Briefly explain the operations of different types of storage oscilloscope (16)
4. Explain the working of electronic multi-meter with necessary diagrams (16)
5. What are the various sources of errors in Q-Meter (8)
6. Explain the deflection sensitivity of a CRT (8)
7. With a neat block diagram explain the function of a general purpose oscilloscope (16)
8. Write brief notes on Dual Trace Oscilloscope (8)
9. Write brief notes on Dual beam oscilloscope (8)
10. Write brief notes on Digital Read out oscilloscope (8)

UNIT-III

SIGNAL GENERATORS AND ANALYZERS

PART A

1. What are the general requirements of signal generator?
2. What is an Oscillator?
3. What is a function generator?
4. What is the principle of sweep generator?
5. What is sweep frequency generator?
6. Give short notes on wave Analyzer.
7. What are the two types of wave analyzer?
8. What is the purpose of using heterodyne wave analyzer?

9. List few applications of wave analyzer
10. What is meant by harmonic distortion?
11. What is known as Total Harmonic Distortion?
12. Define Spectrum analyzer?
13. Give few useful applications of spectrum analyzer?
14. What is known as FFT spectrum analyzer?
15. What is resolution in a FFT Spectrum analyzer?

PART- B

1. Describe the working of function generator with the a block diagram (16)
2. Explain the various applications of the spectrum analyzer (16)
3. Describe the working of a sweep frequency generator (16)
4. Give the principle of wave analyzer with the help of suitable diagrams (16)
5. Explain the distortion analyzer with the help of suitable diagrams (16)
6. Give the block diagram of Spectrum analyzer and explain (8)
7. Describe the working of conventional standard signal generator with the help of a block diagram (8)
8. Explain in detail the Frequency synthesizer (16)
9. Compare modern signal generator with standard signal generator (8)

UNIT-IV
DIGITAL INSTRUMENTS
PART A

1. What is digital instrument?
2. What is analog instrument?
3. What are the advantages of digital instruments over analog instruments?
4. What is digital voltmeter?
5. Compare analog and digital instruments.
6. What are the various types of digital voltmeters?
7. What is the operating principle of a ramp type digital voltmeter?
8. What is the operating principle of an integrating type digital voltmeter?
9. What are the advantages of integrating type digital voltmeter?
10. What is the principle of digital frequency meter?
11. What is the need for period measurements?

12. What is universal counter timer?
13. A $3 \frac{1}{2}$ digit voltmeter is used for measuring voltage
 - (a) Find the resolution
 - (b) How would a reading of 14.53 V be displayed on 100 V scale.
14. What are the errors in measurement with frequency counters?
15. What is ratio mode of operation ?

PART B

1. Draw and explain the circuit of a digital frequency meter (16)
2. Explain with a neat block diagram, the operation of ramp type digital voltmeter (16)
3. Explain Universal counter with the help of suitable diagram (8)
4. Explain with a neat block diagram, the operation of successive approximation type digital voltmeter (16)
5. Explain with a neat block diagram, the operation of Dual slope integrating type digital voltmeter (16)
6. Explain with a neat block diagram, the operation of servo potentiometric type digital voltmeter (8)
7. Explain with a neat block diagram, the operation of voltage to frequency converter type digital voltmeter (8)
8. Explain with a neat block diagram, the operation of potentiometric integrating type digital voltmeter (8)

UNIT-V

DATA ACQUISITION SYSTEMS AND FIBER OPTIC MEASUREMENTS

PART A

1. What is meant by data acquisition?
2. Mention the essential features of a data acquisition system.
3. List the instruments that are needed for data acquisition.
4. What are the types of Data Acquisition system?
5. What are the objectives of Data Acquisition system?
6. What is a Multiplexer?
7. How will you test an audio amplifier using computer operated test?
8. What is IEEE 488 bus system? State the advantages of IEEE 488 bus.

9. What are called as interface signal lines?
10. Write notes on IEEE 488 Standard interface.
11. Why ATN line is used?
12. What are the advantages of fiber optic cable?
13. What are the applications of fiber optic cable?
14. What is Optical Time Domain Reflectometer?
15. What are the applications of Optical Time Domain Reflectometer?

PART B

1. Explain the generalized block schematic of a Digital Data Acquisition system (8)
2. What are the various techniques of multiplexing? Discuss any one in detail. (8)
3. Explain the block diagram of optical time domain reflectometer (8)
4. Write short notes on IEEE 488 bus (8)
5. Explain how a signal is transmitted in a microprocessor based measurement (16)
6. With a block diagram explain the automatic test system to analyze an audio amplifier and radio receiver. (16)

Code No: RR221002

RR

SET-1

B.Tech II Year - II Semester Examinations, April/May-2012
TRANSDUCERS IN INSTRUMENTATION
(ELECTRONICS & INSTRUMENTATION ENGINEERING)

Time: 3 hours**Max. Marks: 80**

Answer any five questions
All questions carry equal marks

- - -

- 1.a) Draw the block diagram for the following systems explaining their functioning.
i) General Instrumentation System
ii) Control Instrumentation system
iii) Telemetry system
- b) How are transducers classified? Explain giving examples. [10+6]
- 2.a) Distinguish between the following pairs of terms clearly.
i) Accuracy – Precision
ii) Repeatability – Reproducibility
iii) Threshold – Lag
iv) Error – Limiting error.
- b) A current of 1A with a probable error of $\pm 0.1A$ passes through a rheostat of 1000Ω with a probable error of $\pm 10 \Omega$. Determine the power dissipated and probable error. [9+7]
3. Explain about I order and II order instruments with examples. Using graphs explain about the response of these instruments for step, ramp and sinusoidal inputs. [16]
4. Explain about loading effect in using potentiometric transducers. Derive the expression for maximum error due to loading effect in the case of a potentiometric transducer with resistance R_p when a voltmeter with resistance R_m is connected across it. [16]
- 5.a) Explain the principle and working of Hot wire Anemometer.
b) What is magnetostrictive effect? Explain the principle and working of a transducer based on this effect. [8+8]
- 6.a) What are the materials exhibiting piezoelectric effect? How are they classified? Explain about their properties.
b) Explain about variable area type capacitance transducers. [8+8]
- 7.a) Explain about Laws of thermocouples.
b) Draw the sketch of an optical pyrometer and explain its working principle. [8+8]
8. Write notes on any TWO
a) Infrared LEDs
b) Electrostatic pressure transducers
c) RTDs. [8+8]

Code No: RR221002

RR

SET-2

B.Tech II Year - II Semester Examinations, April/May-2012
TRANSDUCERS IN INSTRUMENTATION
(ELECTRONICS & INSTRUMENTATION ENGINEERING)

Time: 3 hours**Max. Marks: 80**

Answer any five questions
All questions carry equal marks

- - -

1. Explain about I order and II order instruments with examples. Using graphs explain about the response of these instruments for step, ramp and sinusoidal inputs. [16]
2. Explain about loading effect in using potentiometric transducers. Derive the expression for maximum error due to loading effect in the case of a potentiometric transducer with resistance R_p when a voltmeter with resistance R_m is connected across it. [16]
- 3.a) Explain the principle and working of Hot wire Anemometer.
b) What is magnetostrictive effect? Explain the principle and working of a transducer based on this effect. [8+8]
- 4.a) What are the materials exhibiting piezoelectric effect? How are they classified? Explain about their properties.
b) Explain about variable area type capacitance transducers. [8+8]
- 5.a) Explain about Laws of thermocouples.
b) Draw the sketch of an optical pyrometer and explain its working principle. [8+8]
6. Write notes on any TWO
a) Infrared LEDs
b) Electrostatic pressure transducers
c) RTDs. [8+8]
- 7.a) Draw the block diagram for the following systems explaining their functioning.
i) General Instrumentation System
ii) Control Instrumentation system
iii) Telemetry system
b) How are transducers classified? Explain giving examples. [10+6]
- 8.a) Distinguish between the following pairs of terms clearly.
i) Accuracy – Precision
ii) Repeatability – Reproducibility
iii) Threshold – Lag
iv) Error – Limiting error.
b) A current of 1A with a probable error of $\pm 0.1A$ passes through a rheostat of 1000Ω with a probable error of $\pm 10 \Omega$. Determine the power dissipated and probable error. [9+7]

Code No: RR221002

RR

SET-3

B.Tech II Year - II Semester Examinations, April/May-2012
TRANSDUCERS IN INSTRUMENTATION
(ELECTRONICS & INSTRUMENTATION ENGINEERING)

Time: 3 hours**Max. Marks: 80**

Answer any five questions
All questions carry equal marks

- - -

- 1.a) Explain the principle and working of Hot wire Anemometer.
b) What is magnetostrictive effect? Explain the principle and working of a transducer based on this effect. [8+8]
- 2.a) What are the materials exhibiting piezoelectric effect? How are they classified? Explain about their properties.
b) Explain about variable area type capacitance transducers. [8+8]
- 3.a) Explain about Laws of thermocouples.
b) Draw the sketch of an optical pyrometer and explain its working principle. [8+8]
4. Write notes on any TWO
a) Infrared LEDs
b) Electrostatic pressure transducers
c) RTDs. [8+8]
- 5.a) Draw the block diagram for the following systems explaining their functioning.
i) General Instrumentation System
ii) Control Instrumentation system
iii) Telemetry system
b) How are transducers classified? Explain giving examples. [10+6]
- 6.a) Distinguish between the following pairs of terms clearly.
i) Accuracy – Precision
ii) Repeatability – Reproducibility
iii) Threshold – Lag
iv) Error – Limiting error.
b) A current of 1A with a probable error of $\pm 0.1A$ passes through a rheostat of 1000Ω with a probable error of $\pm 10 \Omega$. Determine the power dissipated and probable error. [9+7]
7. Explain about I order and II order instruments with examples. Using graphs explain about the response of these instruments for step, ramp and sinusoidal inputs. [16]
8. Explain about loading effect in using potentiometric transducers. Derive the expression for maximum error due to loading effect in the case of a potentiometric transducer with resistance R_p when a voltmeter with resistance R_m is connected across it. [16]

Code No: RR221002

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SET-4

B.Tech II Year - II Semester Examinations, April/May-2012
TRANSDUCERS IN INSTRUMENTATION
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