

Code No. M0421

R07**Set No.1**

IV B.Tech I Semester Supplementary Examinations, February/March, 2012
ELECTRONIC MEASUREMENTS & 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 accuracy, precision and resolution as used for indicating instruments.
b) Two resistors have the following ratings: $R_1 = 200 \Omega \pm 10\%$ and $R_2 = 500 \Omega \pm 5\%$. calculate
 - i) the magnitude of error in each resistor
 - ii) the limiting error in ohms when the resistors are connected in series;
 - iii) the limiting error in ohms when the resistors are connected in parallel.
2. a) Explain the important specifications for sine/square wave generators and Function generators.
b) Draw a simple circuit for frequency modulating an RF signal generator and explain its operation.
3. a) With a neat sketch explain the operation of a fundamental suppression harmonic distortion analyzer
b) Explain the important applications of a spectrum analyzer.
4. a) Explain blanking and unblanking in an oscilloscope, and discuss the need for blanking.
b) Sketch the construction of a dual-trace oscilloscope and explain its operation.
5. a) Describe briefly about various probes used in CROs
b) Explain how the frequency is measured using a frequency counters.
6. a) A balanced ac bridge has the following constants.
Arm AB- $R = 1K\Omega$ in parallel with $C = 0.047 \mu F$
Arm BC- $R = 2k\Omega$ in series with $C = 0.047 \mu F$
Arm CD- unknown
Arm DA- $C = 0.25 \mu F$
The frequency of the oscillator is 1000Hz. Determine the constants of arm CD.
b) Explain the principle and working of a Q-meter

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7. a) With a neat diagram explain the operation of a LVDT
b) Explain the principle of operation of a i) Thermocouple and ii) RTD.

8. a) Explain briefly about various pressure sensing elements.
b) Explain how a strain gauge can be used to measure the pressure.

FirstRanker

Code No. M0421**R07****Set No.2**

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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) A PMMC instrument with a full scale deflection of $50 \mu\text{A}$ and an internal resistance of 100Ω is available. It is to be converted into a 0-5V, 0-10V, 0-50V, and 0-500V multi range voltmeter using series-connected resistors. Calculate the values of the multiplier resistors.
2. a) With a block diagram explain the working of a function generator producing sine, square and triangle waveforms.
b) Sketch the circuit and explain with waveforms an op-amp a stable multi vibrator for use as a 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) Draw the block diagram of a basic CRO and explain each and every block.
b) Describe the procedure of frequency and time period measurement using Lissajous figures.
5. a) With a block diagram explain the operation of a sampling oscilloscope.
b) Explain the sources of errors and their minimizing methods in frequency counters
6. a) What are the limitations of a Wheatstone bridge circuit?
b) Draw the circuit diagram of Anderson's bridge, explain its operation and derive the equations for unknown variables.

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Set No.2

7. a) Define gauge factor of a strain gauge and derive the expression for it.
b) Describe the operation of a piezo-electric transducer.

8. a) Explain the working principle of a capacitive pressure transducer.
b) Explain how an LVDT can be used to measure the pressure.

FirstRanker

Code No. M0421**R07****Set No.3**

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ELECTRONIC MEASUREMENTS & 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 accuracy, precision and resolution as used for indicating instruments.
b) Two resistors have the following ratings: $R_1 = 100 \Omega \pm 5\%$ and $R_2 = 200 \Omega \pm 5\%$. calculate
 - i) the magnitude of error in each resistor
 - ii) the limiting error in ohms when the resistors are connected in series;
 - iii) the limiting error in ohms when the resistors are connected in parallel.
2. a) Explain the important specifications for sine/square wave generators and Function generators.
b) Draw a simple circuit for frequency modulating an RF signal generator and explain its operation.
3. a) With a neat sketch explain the operation of a fundamental suppression harmonic distortion analyzer
b) Explain the important applications of a spectrum analyzer.
4. a) explain blanking and unblanking in an oscilloscope, and discuss the need for blanking.
b) Sketch the construction of a dual-beam oscilloscope and explain its operation.
5. a) With a block diagram explain the operation of a sampling oscilloscope.
b) Explain the sources of errors and their minimizing methods in frequency counters.
6. a) What are the limitations of a Wheatstone bridge circuit?
b) Draw the circuit diagram of Maxwell's bridge, explain its operation and derive the equations for unknown variables.

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7. a) Define gauge factor of a strain gauge and derive the expression for it.
b) Describe the operation of a piezo-electric transducer

8. a) Explain the working principle of a capacitive pressure transducer.
b) Explain how an LVDT can be used to measure the pressure

FirstRanker

Code No. M0421**R07****Set No.4**

IV B.Tech I Semester Supplementary Examinations, February/March, 2012
ELECTRONIC MEASUREMENTS & INSTRUMENTATION
(Electronics and Communication 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) A PMMC instrument with a full scale deflection of $100 \mu\text{A}$ and an internal resistance of 200Ω is available. It is to be converted into a 0-5V, 0-10V, 0-50V, and 0-100V multi range voltmeter using series-connected resistors. Calculate the values of the multiplier resistors.
2. a) With a block diagram explain the working of a function generator producing sine, square and triangle waveforms.
b) Sketch the circuit and explain with waveforms an op-amp a stable multi vibrator for use as a 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) Draw the block diagram of a basic CRO and explain each and every block.
b) Describe the procedure of frequency and phase difference measurement using Lissajous figures.
5. a) Describe briefly about various probes used in CROs
b) Explain how the frequency is measured using a frequency counters.

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6. a) A balanced ac bridge has the following constants.
Arm AB- $R = 2\text{K}\Omega$ in parallel with $C = 0.047 \mu\text{F}$
Arm BC- $R = 4\text{k}\Omega$ in series with $C = 0.047 \mu\text{F}$
Arm CD- unknown
Arm DA- $C = 0.25 \mu\text{F}$
The frequency of the oscillator is 2000Hz. Determine the constants of arm CD.
b) Explain the principle and working of a Q-meter.
7. a) With a neat diagram, explain the operation of a LVDT.
b) Explain the principle of operation of a i) Thermocouple and ii) RTD.
8. a) Explain briefly about various pressure sensing elements.
b) Explain how a strain gauge can be used to measure the pressure.