

Code No. M0421

**R07**

**Set No.1**

**IV B.Tech I Semester Supplementary Examinations, February/March, 2011**  
**ELECTRONIC MEASUREMENTS & INSTRUMENTATION**  
**(Electronics & 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 sources of errors of different types of errors and precautions to minimize them.  
(b) Explain the bridge type of thermocouple arrangement and mention its applications.
2. Draw the block diagram of a function generator and explain each block in detail.
3. (a) What is the difference between a wave analyzer and a spectrum analyzer  
(b) With a neat sketch explain the operation of a heterodyne type wave analyzer
4. (a) Why is a delay line used in the vertical section of an oscilloscope?  
(b) Draw the block diagram of an oscilloscope and explain the function of each block.
5. (a) State the function and explain the working of a 10:1 probe for a cro?  
(b) With a block diagram explain the operation of a sampling oscilloscope.
6. (a) Explain various null detectors used in ac bridges  
(b) Draw the circuit diagram of Schering 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 an LVDT
8. (a) What are the different pressure sensing elements  
(b) What are the various configurations used in a DAS?

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**Set No.2**

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1. (a) What are the advantages of an Aryton shunt Ammeter over a multi range Ammeter?  
(b) What is a thermocouple? Explain the Construction and working of a Thermocouple measuring Instrument with its range of measurement.
2. With a neat circuit diagram and wave forms explain the working of a standard sweep generator
3. (a) Explain the two types of Spectrum Analyzers.  
(b) Explain the following terms associated with Spectrum Analyzer:
  - i) Sensitivity
  - ii) Dynamic Range
  - iii) Harmonic Mixing.
4. (a) How is the electron beam focused on to a fine spot on the CRT screen  
(b)With a block diagram explain the operation of a dual beam oscilloscope.
5. (a) Explain the method of finding phase, frequency relationship of two waveforms using Lissajous figures.  
(b) Explain how the time period is measured using a frequency counter.
6. (a) Explain various null detectors used in dc bridges  
(b) Draw the circuit diagram of Maxwell'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 a thermocouple.
8. (a) What are the main elements of velocity transducer?  
(b) Illustrate the principle of force summing devices using suitable examples and sketches.

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

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1. (a) Explain the basic principle of a shunt type ohmmeter.  
(b) Explain the following
  - i) Resolution
  - ii) Fidelity
  - iii) lag
  - iv) Error.
2. With a block diagram explain the operation of a random noise generator.
3. (a) State the applications of a spectrum analyzer.  
(b) Explain about Harmonic Analyze.
4. (a) Draw the block diagram of a basic horizontal Deflection section and explain each and every block.  
(b) Write short notes on the synchronization of the sweep
5. (a) With a block diagram explain the operation of a digital storage oscilloscope.  
(b) What method can be used to increase the frequency range of a frequency counter? How can this be achieved without degrading the accuracy of the counter?
6. (a) Discuss the bridge which is used for the precision measurement of capacitors and their insulating properties. How does the balancing conditions help in finding the reactance of the unknown component and its dissipation factor.  
(b) A bridge has 2000 ohm in one arm and its opposite arm has a capacitor of value  $0.5\mu\text{F}$ , the arm to the right of resistor arm is having 1000 ohm in shunt with a  $0.5\mu\text{F}$  the arm opposite to this arm is connected with the unknown component. Find the value of the component and its dissipation factor.
7. (a) Explain the operation of a two wire RTD.  
(b) What is a load cell? Explain its operation.
8. (a) Explain how humidity is measured?  
(b) Draw the block diagram of a standard DAS and explain function of each block.

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**Set No.4**

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**Max. Marks: 80**

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1. (a) Differentiate between i) accuracy and precision ii) Threshold and deadband  
(b) Explain the principle of series type ohmmeter
2. Draw the block diagram of a function generator and explain each block in detail.
3. (a) Compare the selectivity characteristics of the Spectrum Analyzer and Wave Analyzer.  
(b) Explain the operation of digital Fourier analyzers.
4. Describe the following:
  - (a) Sources of Synchronization.
  - (b) Blanking circuit
  - (c) Focus control.
5. (a) With a block diagram and wave forms explain the operation of a sampling Oscilloscope.  
(b) Explain how the frequency is measured using a frequency counter.
6. (a) Explain how a Kelvin's double bridge can accurately measure low resistances. Also derive the condition for balance.  
(b) Why is Wagner's additional ground connection made?
7. (a) Where are piezoelectric transducers mainly used and why?  
(b) Give the equivalent circuit of a crystal and explain how a crystal is used as a transducer?  
(c) Explain the construction and working of strain gauge.
8. (a) Draw the experimental set up measuring force using piezoelectric crystal  
(b) What are the important factors that decide the configuration and sub system of a DAS?