Set No. 1

IV B.Tech I Semester Regular Examinations, November 2008
ELECTRONIC MEASUREMENTS AND 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 the terms :
    i. Significant figures
    ii. Conformity.
   (b) How are random errors analyzed? Explain them with examples.
   (c) Explain about true RMS voltmeter.   [6+5+5]

2. (a) What is meant by arbitrary waveform? Discuss with a neat block diagram the working of a arbitrary waveform generator.
   (b) Distinguish between a random pattern and video pattern generators. Discuss about important features of both.   [8+8]

3. (a) Explain with the help of block diagram the working of a spectrum analyzer.
   (b) Explain the different applications of spectrum analyzer.   [8+8]

4. (a) Explain the working of a post deflection acceleration oscilloscope using a scan expansion mesh.
   (b) Briefly summarize the characteristics of commonly used phosphors.   [10+6]

5. (a) Draw the block diagram of a digital storage oscilloscope and explain its operation.
   (b) What are the advantages of an active probe?   [10+6]

6. (a) Explain the FM recording method.
   (b) What are the important features of a Kit type LCR bridge?   [8+8]

7. (a) Define a strain gauge? Mention merits & demerits of strain gauge.
   (b) Derive the expression for the gauge factor (K) of a bonded resistance wire strain gauge?   [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]

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Code No: R05410402

Set No. 2

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Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
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1. (a) Explain the functioning of a potentiometer type digital voltmeter.
   (b) A $3\frac{1}{2}$ digit of DVM has an accuracy of $\pm$ 0.5 percent of reading $\pm$ 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) With respect to construction and circuit configuration, explain how a square wave generator differs from sine wave generator.
   (b) With a neat block diagram discuss about an AF sine wave generator.   [8+8]

3. (a) What is the difference between a wave analyzer and harmonic distortion analyzer?
   (b) Explain with the help of block diagram the working of a harmonic distortion analyzer?   [8+8]

4. (a) With a neat circuit diagram, explain the function of associated circuits that are used for CRT operation.
   (b) Explain how the light is emitted on the screen of a CRO.   [10+6]

5. (a) Draw the circuit of active probe using FET. Explain its operation and limitations.
   (b) What is meant by variable persistence?   [10+6]

6. (a) Discuss the "Direct-connection" technique of using Q-meter.
   (b) A coil with a resistance of 5Ω is connected to the terminals of the basic Q-meter. Resonance occurs at an oscillator frequency of 4 MHz and resonating capacitance of 80 pF . Calculate the percentage of error introduced by the insertion resistance, Rsh=0.01Ω.   [8+8]

7. (a) Compare thin film RTD and wire wound RTD.
   (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]

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Set No. 3

IV B.Tech I Semester Regular Examinations, November 2008
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
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Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
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1. (a) List out some important features like, operating and performance characteristics of digital voltmeters.

   (b) With the help of a neat block diagram explain the principle of operation of a ramp type digital voltmeter. List out its advantages and disadvantages. [8+8]

2. (a) With neat diagrams, discuss about fixed and variable AF oscillators.

   (b) Describe the following terms related to signal generators:

      i. Random Noise
      ii. Arbitrary waveform
      iii. sweep generator.   [10+6]

3. (a) Explain with a neat block diagram, the working principle of a distortion analyzer.

   (b) Explain about the following terms:

      i. Distortion in a waveform
      ii. Distortion in a communication signal.   [8+8]

4. Explain the function of each of the following CRO controls.

   (a) Focus

   (b) Z-Axis Modulation

   (c) Astigmatism.

   (d) Trigger and Calibrator.   [4+4+4+4]

5. (a) Discuss the following display modes of dual-trace CRO

      i. A and B chopped
      ii. A and B alternate.

   (b) Explain the working principles of a current probe.   [8+8]

6. (a) With a schematic diagram explain the operation of pulse duration modulation (PDM) recording system.

   (b) What are the important features of a Kit type LCR bridge?   [10+6]

7. Briefly explain the different types of resistance thermometers? Also give their applications.   [16]

Set No. 3

8. (a) Write about calibration of pressure measuring instrument?

(b) What is piezo electric effect? How pressure is measured by using piezoelectric pressure transducer? [8+8]

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$$\boxed{\textbf{Set No. 4}}$$

IV B.Tech I Semester Regular Examinations, November 2008
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Electronics & Communication Engineering)

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

Answer any FIVE Questions
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1. (a) Define voltmeter sensitivity. What is the loading effect of a DC voltmeter? Explain with an example.

   (b) In the circuit shown in figure 1b, two resistors R_1 and R_2 are connected to a 100V dc source. If the voltage across R_2 is to be measured by voltmeters having.
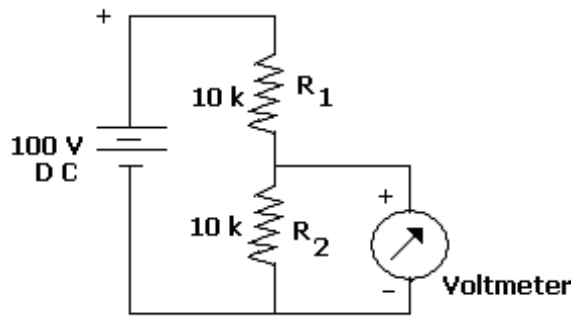

Figure 1b

   i. a sensitivity of 1000 Ω/V and

   ii. a sensitivity of 20,000Ω/V, then find which voltmeter will read the accurate value of voltage across R_2. Both the meters are used on the 50V range.

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) Distinguish between spectrum analyzer and harmonic distortion analyzer.

   (b) Describe a signature analyzer and explain usage in locating faults in digital circuits.   [8+8]

4. (a) Draw the neat diagrams of both vertical and horizontal deflection systems and explain briefly about their working.

   (b) Draw the block diagram of a dual beam oscilloscope and explain its working.
                                                                            [10+6]

5. (a) A high impedance probe with 9 M ohm resistance and 4 pf capacitance is connected to an oscilloscope with an input resistance of 1 M ohm. When the probe was connected, the effective capacitance is decreased to 3.6 pf. Find

   i. the capacitance of the oscilloscope

ii. the attenuation of the probe.

(b) write the differences between digital storage oscilloscope and conventional storage oscilloscope. [8+8]

6. (a) Describe the method used to measure the high impedance components using Q meter.

(b) Draw the circuit of a Wien bridge and derive an expression for the frequency. [8+8]

7. (a) What is a RTD and where is it used?

(b) What is the difference between photo-emissive, photo-conductive and photo-voltaic transducers? [6+10]

8. Briefly explain the working principles and measurement of force by any two non-electric techniques? [16]

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