R10

Set No: 2

Code No: R31044

III B.Tech. I Semester Regular and Supplementary Examinations, December - 2013 **ELECTRONIC MEASUREMENTS AND INSTRUMENTATIONS**

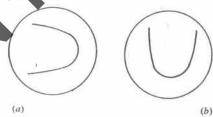
(Common to Electronics and Communication Engineering & Electronics and Instrumentation Engineering)

Time: 3 Hours Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Differentiate between a series type ohmmeter and a shunt type ohmmeter.

- (b) Convert a basic D'Arsonval movement with an internal resistance of 50Ω and a full scale deflection current of 2 mA into a multirange dc voltmeter with voltage ranges of 0-10V, 0-50V, 0-100V and 0-250V.
- 2. (a) Explain the block diagram of an AF sine and square wave generator.
 - (b) Discuss the working of square and pulse generator with a block diagram.
- 3. Describe the basic circuit of a spectrum analyzer. Explain how the spectra of the following is displayed
 - (i) Continuous wave signals
- (ii) Amplitude modulated signals
- (iii) Frequency modulated signal
- iv Pulse modulated signal
- 4. (a) Explain with the help of block diagram of dual beam CRO.
 - (b) Discuss the triggered sweep CRO with neat circuit diagram.
- 5. (a) Describe how the time and period measurements can be made with the use of a CRO
 - (b) Find the frequency of the vertical plates if the frequency applied to horizontal plate is 50 Hz for the patterns shown.



- 6. What are the different sources of errors in a.c bridges? Explain the precautions taken and the techniques used for elimination of these errors.
- (a) Explain briefly the different types wire strain gauges.
 - (b) The thermistor is a $4k\Omega$ type, the meter is a 50 mA meter with a resistance of 3 $k\Omega$, R_c is set to 17 Ω and supply V_t is 15 V. What will be the meter reading at 77^0F (25 0C) and at 150 0F .
- 8. Describe the methods of measurement of pressure using
 - (a) Capacitive transducer (b) Photo electric transducer

1 of 1

R10

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Time: 3 Hours Max Marks: 75

Answer any FIVE Questions All Questions carry equal marks

- 1. (a) Define the sensitivity of a multimeter. Draw the block diagram of a simple multimeter and explain its operation?
 - (b) A series ohm meter uses a 50Ω basic movement requiring a full scale deflection of 1 mA. The internal battery voltage is 3 V. The desired scale marking for half scale deflection is 2000Ω . Calculate (i) Values of R_1 and R_2 (ii) Maximum value of R_2 to compensate for a 10% drop in battery.
- 2. (a) Discuss the working of standard signal generator with a near sketch.
 - (b) List out the requirements of pulse in square and pulse generator.
- 3. (a) Explain the different types of distortions caused by amplifiers.
 - (b) Explain the term 'total harmonic distortion'? Describe the harmonic distortion Analyzers with neat sketch.
- 4. (a) Describe about the vertical amplifier used in a CRO.
 - (b) The deflection sensitivity of an oscilloscope is 35 V/cm. If the distance from the deflection plates to the CRT screen is 16 cm, the length of the deflection plates is 2.5 cm, and the distance between the deflection plates is 1.2 cm. What is the acceleration anode voltage?
- 5. (a) State the function and explain the working of a 10:1 probe for a CRO.
 - (b) Explain the working of digital readout oscilloscope with a neat sketch.
- 6. (a) Explain the principle of Q meter with the help of circuit diagram.
 - (b) The self capacitance of a coil is measured by using the Q meter. The first measurement is at f_1 =1 MHz and C_1 =500 pf. The second measurement is at f_2 =2MHz and C_2 =110pf. Find the distributed capacitance. Also calculate the value of L.
- 7. (a) Discuss the translator, rotational and heliport resistive transducer.
 - (b) A displacement transducer with a shaft stroke of 3 in. is applied to the circuit. The total resistance of the potentiometer is $5k\Omega$. The applied voltage V_t is 5 V. When the wiper is 0.9 in. from B, what is the value of the output voltage?
- 8. (a) Explain with the help of block diagram of general data acquisition system.
 - (b) List out the objectives of a data acquisition system.

1 of 1

Code No: R31044

R10

Set No: 4

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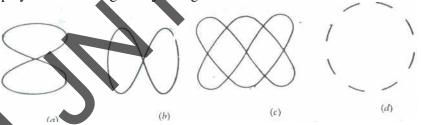
ELECTRONIC MEASUREMENTS AND INSTRUMENTATIONS

(Common to Electronics and Communication Engineering & Electronics and Instrumentation Engineering)

Time: 3 Hours Max Marks: 75

Answer any FIVE Questions All Questions carry equal marks

- 1. (a) List out the sources of errors.
 - (b) Design a series type ohmmeter, the basic movement requires a current of 1 mÅ for full scale deflection and has an internal resistance of 50Ω . The internal battery has a voltage of 3V. The desired value of half scale resistance is 2000Ω . Calculate (i) the value of resistance R_1 and R_2 (ii) the range of values of R_2 , if the battery voltage may vary from 2.7 V to 3.1 V.
- 2. Explain the following with a neat sketch
 - (a) Random noise generator (b) Sweep generator
- 3. (a) Describe the frequency selective wave analyzer with neat sketch.
 - (b) Explain with neat sketch of the digital fourier analyzers.
- 4. (a) List out the cathode ray oscilloscope features.
 - (b)Explain in detail the principle of operation of a single beam CRO?
- 5. (a) Write the standard specifications of CRO.
 - (b) Calculate the ratio of vertical to horizontal frequencies for an oscilloscope which displays the following Lissajous figures shown.



- 6. (a) Describe the working of schering bridge. Derive the equation for capacitance and dissipation factor?
 - (b) An ac bridge has the following constants: arm AB capacitor of 0.5 μ F in parallel with 1 k Ω resistance; arm AD resistance of 2 k Ω ; arm BC capacitor of 0.5 μ F; arm CD unknown capacitor C_x and R_x inseries, frequency 1 kHz. Determine the unknown capacitance and dissipation factor.
- 7. (a) Explain the classification of electrical transducers and its advantages.
 - (b)List out the factors should be considered while selecting a transducer.
- 8. (a) Name the transducers which are used for the measurement of linear velocity?
 - (b) State the applications of data acquisition systems.

1 of 1