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10IT35

**Third Semester B.E. Degree Examination, June/July 2017**  
**Electronic Instrumentation**

Time: 3 hrs.

Max. Marks: 100

**Note:** 1. Answer any FIVE full questions, selecting  
atleast TWO questions from each part.  
2. Missing data, if any, may be suitably assumed.

**PART – A**

- 1 a. What is systematic error? Explain the different types of systematic errors and how they can be avoided? (08 Marks)
- b. The value of voltage across a resistor is 5V. The voltmeter reads as 4.95V. Calculate :  
i) Absolute error ii) % error iii) relative accuracy iv) % of accuracy. (04 Marks)
- c. Draw the block diagram of a true RMS voltmeter and explain the working. (08 Marks)
- 2 a. Discuss the operating and performance characteristics of digital voltmeter. (04 Marks)
- b. With the help of block diagram and waveforms, explain the principle of operation of integrating type DVM which converts voltage to frequency. (08 Marks)
- c. Draw the block diagram of a basic digital multimeter and explain the working. (08 Marks)
- 3 a. Write the basic CRO block diagram and explain the function of each of the blocks. (08 Marks)
- b. Explain with waveforms the : i) ALTERNATE mode and ii) CHOP mode of operation in a dual trace oscilloscope. (08 Marks)
- c. What is the function of electronic switch? Explain with basic block diagram. (04 Marks)
- 4 a. What is the need of delayed time Basic system? Explain. (04 Marks)
- b. With the help of block diagram and waveforms explain the working of a sampling oscilloscope. (10 Marks)
- c. Discuss the applications of digital storage oscilloscope. (06 Marks)

**PART – B**

- 5 a. Draw the block diagram of AF sine and square wave generator and explain its working in detail. (08 Marks)
- b. Explain the principle of operation of frequency synthesizer using PLL system. (08 Marks)
- c. Describe briefly the sweep frequency generator. Also mention its applications. (04 Marks)
- 6 a. What are the limitations of wheat-stone bridge? (04 Marks)
- b. Given a centre zero (200 – 0 – 200) MA movement having an internal resistance of 125Ω. Calculate the current through the galvanometer by the approximate method for the wheat-stones bridge with four arms as 700Ω, 700Ω 700Ω and 735Ω, and E = 10V. (06 Marks)
- c. A Maxwell bridge is used to measure inductance. The bridge constants at balance are :  
Find the series equivalent of the unknown impedance. Derive the relations used. (10 Marks)
- 7 a. What are the main advantages of electrical transducers? Explain in brief. (04 Marks)
- b. Discuss the construction of semiconductor strain gage and list the advantages and disadvantages (08 Marks)
- c. Explain the principle of operation of LVDT with the help of neat sketch. (08 Marks)
- 8 a. With circuit diagram and characteristics, explain the principle of operation of photo-transistor. (08 Marks)
- b. Write a note on classification of displays. (04 Marks)
- c. With a neat diagram, explain the measurement of RF power using bolometer bridge. (08 Marks)

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Important Note: 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written on the remaining pages will be treated as malpractices.