

USN

--	--	--	--	--	--	--	--	--	--

10IT35

Third Semester B.E. Degree Examination, June 2012

Electronic Instrumentation

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. Define the following terms:
 - i) Gross error and systematic error (06 Marks)
 - ii) Absolute error and relative error (08 Marks)
- b. Explain the working of true RMS voltmeter, with a neat block diagram. (06 Marks)
- c. Convert a basic D' Arsonal movement with an internal resistance of 100Ω and a full scale deflection of 10 mA into a multi range dc voltmeter with ranges from 0 – 5 V, 0 – 50 V and 0 – 100 V. (06 Marks)

- 2 a. A $4\frac{1}{2}$ digit voltmeter is used for voltage measurement:
 - i) Find its resolution
 - ii) How would 12.98 V be displayed on 10 V range?
 - iii) How would 0.6973 V be displayed on 1 V and 10 V range? (07 Marks)
- b. Explain the working principle of successive approximation digital voltmeter, with the help of block diagram. (07 Marks)
- c. With a basic block diagram, explain the method used for digital measurement of time period. (06 Marks)

- 3 a. Explain the working of dual trace oscilloscope, with a neat block diagram and necessary waveforms. (10 Marks)
- b. With the help of basic block diagram and circuit diagram, explain the working principle of electronic switch. (08 Marks)
- c. Briefly explain about the focus control knob available on the CRO panel. (02 Marks)

- 4 a. Describe the working of oscilloscope delayed time base system, with the help of block diagram and associated waveforms. (10 Marks)
- b. Explain the basic operation of digital storage oscilloscope, with the help of block schematic and associated waveforms. (10 Marks)

PART – B

- 5 a. With the help of block diagram, explain the working of modern laboratory signal generator. (10 Marks)
- b. Explain the working principle of frequency synthesizer, with a neat block diagram. (10 Marks)

- 6** a. Mention the limitations of wheatstone's bridge. Derive the balance equation for Kelvin's double bridge. **(10 Marks)**
b. A capacitance comparison bridge is used to measure a capacitive impedance at a frequency of 2 kHz. The bridge constants at balance are $C_3 = 100 \mu\text{F}$, $R_1 = 10 \text{ K}\Omega$, $R_2 = 50 \text{ K}\Omega$ and $R_3 = 100 \text{ K}\Omega$. Find the equivalent circuit of the unknown impedance. **(04 Marks)**
c. Derive an expression for frequency of the wein bridge circuit. **(06 Marks)**
- 7** a. Explain the construction and working of bonded resistance wire strain gauge and semiconductor strain gauge. **(10 Marks)**
b. With necessary sketches, explain the construction and working principle of LVDT. **(10 Marks)**
- 8** a. Mention the advantages and limitations of RTD. **(04 Marks)**
b. Define the terms: i) Seebeck effect, ii) Peltier effect. **(04 Marks)**
c. Explain how bolometer bridge can be used for the measurement of power. Also discuss the application of unbalanced bolometer bridge. **(08 Marks)**
d. List the important features of LCD. **(04 Marks)**

* * * * *