



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Third Semester, B.E. - Electronics and Communication Engineering

Semester End Examination; Dec - 2017/Jan - 2018

Measurements and Instrumentation

Time: 3 hrs

Max. Marks: 100

Note: Answer FIVE full questions, selecting ONE full question from each unit.

UNIT - I

- 1 a. Define the following terms with an example: 6
- (i) Precision (ii) Accuracy (iii) Resolution.
- b. Explain the working of AC voltmeter using half wave rectifier. 6
- c. Convert a basic D'Arsonal movement with an Internal resistance of 50Ω and a full scale deflection current of 2 mA into a multi range DC voltmeter with voltage ranges of 8
- 0 - 10 V, 0 - 50 V, 0 - 100 V and 0 - 250 V.
- 2 a. Explain the working of successive approximation type DVM with a neat diagram. 10
- b. Discuss the working of Dual Slope Integration type DVM (voltage to time conversion). 10

UNIT - II

- 3 a. Explain how lead resistance is measured using a bridge? Also give conditions for bridge balance. 8
- b. Explain the working of a capacitance comparison bridge with the help of a diagram and equations. 6
- c. In a standard wheat stone bridge $E = 6 \text{ V}$, $R_1 = 1 \text{ k}\Omega$, $R_2 = 2.5 \text{ k}\Omega$, $R_3 = 3.5 \text{ k}\Omega$ and $R_4 = 10 \text{ k}\Omega$. Find the current through the galvanometer. Assume $R_g = 300 \Omega$. 6
- 4 a. Find the series equivalent inductance and resistance of the network that causes an opposite angle (Hay bridge) to null with the following bridge arms : 6
- $\omega = 3000 \text{ rad/s}$, $R_2 = 10 \text{ k}\Omega$, $R_1 = 2 \text{ k}\Omega$, $C_1 = 1 \mu\text{F}$, $R_3 = 1 \text{ k}\Omega$.
- b. Explain the Wagner's Earth connection with a neat diagram. 8
- c. Explain the following : 6
- (i) Applications of Wheatstone Bridge (ii) Inductance Comparison Bridge.

UNIT - III

- 5 a. List Important advantages of Electrical transducers. 8
- b. What are the variable reluctance type transducers? Explain. 6
- c. List important advantages and disadvantages of semiconductors strain gauge. 6

- 6 a. Explain the constructional features of a thermometer with a neat diagram. 8
- b. How strain gauge can be used in a bridge arrangement, explain with relevant diagram? 6
- c. List the important advantages of LVDT. 6

UNIT - IV

- 7 a. With the help of neat diagram, explain the working of photo transistor. Also give one application of it. 10
- b. Briefly explain the following with relevant diagram : 10
- (i) Photomultiplier tube (ii) Photocells.
- 8 a. With a neat diagram, explain the working of modern laboratory signal generator. 10
- b. With neat block diagrams, explain the working of a pulse generator. 10

UNIT - V

- 9 a. Explain the working of digital storage oscilloscope with a neat diagram and waveforms. 10
- b. With neat diagram, explain analog storage oscilloscope of bistable storage type. 10
- 10 a. Explain the three different types of harmonic distortion analyzer. 10
- b. With the help of a block diagram, explain the working of RF spectrum analyzer. 10

* * *