



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; March - 2021
Electronic Instrumentation

Time: 3 hrs

Max. Marks: 100

Course Outcomes

The Students will be able to:

CO1: Ability to apply the basic knowledge of Electrical and Electronic principles in Electronic Instrumentation.

CO2: Ability to analyze the working principle and construction of the electronic measuring instruments.

CO3: Ability to measure various electrical and physical quantities and related parameters using meters and transducers.

CO4: Ability to design a system for the desired specifications in Electronic Instrumentation.

CO5: Ability to understand the working of oscilloscopes, signal generators, wave analysers and harmonic distortion analysers.

Note: I) PART - A is compulsory. Two marks for each question.

II) PART - B: Answer any **Two** sub questions (from a, b, c) for Maximum of **18 marks** from each unit.

Q. No.	Questions	Marks	BLs	COs	POs
I : PART - A		10			
I a.	Define Error and Accuracy.	2			
b.	What two conditions must be satisfied to make an AC bridge balance?	2			
c.	List different types of Transducers.	2			
d.	What are the basic elements of signal conditioner?	2			
e.	What is the specialty of a storage oscilloscope?	2			
II : PART - B		90			
UNIT - I		18			
1 a.	With the help of a neat circuit diagram, explain the working of a dual slope DVM.	9			
b.	Sketch the block diagram of True RMS voltmeter and explain the working principle.	9			
c.	Convert a basic D'Arsonval movement with an internal resistance of 50 Ω and a full scale deflection current of 2 mA into a multi-range DC voltmeter with voltage ranger of (0 - 10) V, (0 - 50) V, (0 - 100) V and (0 - 250) V.	9			
UNIT - II		18			
2 a.	Explain and obtain balance equation for Kelvin's double bridge.	9			
b.	With AC bridge circuit, derive a balancing condition to determine the unknown frequency in Wein's bridge.	9			
c.	Derive balancing conditions for unknown series resistance and inductance of the circuit causes an opposite angle [HAY's bridge] to null with the following bridge arms: $W = 3000$ rad/sec, $R_2 = 10$ k Ω , $R_1 = 2$ k Ω , $R_3 = 1$ k Ω , $C_1 = 1$ μ F. Determine unknown element values.	9			

UNIT - III**18**

- 3 a. Explain the construction principle and operation of Linear Variable Differential Transducer (LVDT). 9
- b. What is electrical Transducer? What are the functions / parameters of Transducer? Mention advantages of electrical transducer. 9
- c. Explain the basic strip chart recorder with its block diagram. 9

UNIT - IV**18**

- 4 a. Describe the working of frequency selective voltmeter with block diagram. 9
- b. Brief out the objectives of a Data Acquisition System (DAS). Also mention important factors that decide DAS. 9
- c. Describe the operation of *RF* heterodyne wave analyzer with block diagram. 9

UNIT - V**18**

- 5 a. Explain the working of a standard sweep generator with a diagram. 9
- b. Sketch and explain the block diagram of a pulse generator. 9
- c. With neat block diagram and waveforms, explain the basic operation of sampling oscilloscope. 9

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