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

(An Autonomous Institution affiliated to VTU, Belagavi)

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

Semester End Examination; February - 2022

Data Acquisition and Instrumentation

Time: 3 hrs *Max. Marks: 100*

Course Outcomes

The Students will be able to:

CO1: Apply the knowledge of basic electrical engineering in understanding basic principles of data acquisition system, measuring systems, transducers, instrumentation amplifier and recorders.

CO2: Apply appropriate measuring techniques in measuring electrical and mechanical parameters.

CO3: Identify and Determine various measuring errors and other measurable parameters in measuring instruments.

CO4: Analyze the working principle of various electronic measuring instruments.

CO5: Design a system for the desired specification in electronic instrumentation.

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.	List the objectives of DAS.	2	L1	CO1	PO1
	b.	What factors to be considered for the selection of better transducer?	2	L1	CO1	PO1
	c.	Define sensitivity and resolution of measuring instrument.	2	L1	CO1	PO1
	d.	Define sensitivity of digital meter.	2	L1	CO1	PO1
	e.	Draw the block diagram of Op-amp.	2	L1	CO1	PO1
		II : PART - B	**90**			
		UNIT - I	**18**			
1	a.	Explain with neat diagram multichannel DAS.	9	L2	CO1	PO1
	b.	With neat diagram, explain the operation of R-2R ladder type network (D/A).	9	L2	CO1	PO1
	c.	Discuss the generalized data acquisition system with neat diagram.	9	L2	CO1	PO1
		UNIT - II	**18**			
2	a.	Derive an expression for gauge factor '*K*' of bonded resistance wire strain gauge.	9	L2	CO2	PO1
	b.	Explain the construction and working principle of resistance thermometer and discuss its limitations.	9	L2	CO2	PO1
	c.	Explain various configuration of thermistor and discuss advantages and limitations.	9	L2	CO2	PO2
		UNIT - III	**18**			
3	a.	Explain the types of static error in measuring instrument.	9	L2	CO3	PO1
	b.	Explain AC voltmeter using rectifier with diagram (full wave).	9	L2	CO3	PO2
	c.	Discuss peak responding voltmeter with block diagram.	9	L2	CO3	PO1

Contd… 2

	UNIT - IV	**18**			
4 a.	Discuss the working principle and operation of dual slope integrating type DVM (voltage to time conversion) with diagram.	9	L2	CO5	PO1
b.	Explain the block diagram of successive approximation type DVM.	9	L2	CO5	PO2
c.	Discuss the working principle of digital PH meter with diagram.	9	L2	CO5	PO2
	UNIT - V	**18**			
5 a.	With the help of diagram, explain chopped and modulated DC amplifier.	9	L2	CO4	PO1
b.	Explain the construction and working principle of galvanometer type recorder.	9	L2	CO4	PO1
c.	Describe the functionality of *X-Y* recorder with diagram and discuss its applications.	9	L2	CO4	PO1

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