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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Eighth Semester, B.E. - Electronics and Communication Engineering
**Semester End Examination; July - 2021**
Data Acquisition and Instrumentation

Time: 3 hrs   *Max. Marks: 100*

*Note: Answer any **FIVE** full questions.*

1 a.	Draw the schematic block diagram of a generalized data acquisition system and explain.	10
b.	Discuss the objectives of DAS and computer based DAS.	10
2 a.	For a 5 bit resistive divider, determine the following , (Assuming 0 = 0 and 1 = +10 V)	
	i) The weights assigned to the LSB	
	ii) The weights assigned to the 2nd and 3rd LSB	10
	iii) The change in output voltage due to the change in the LSB, 2nd LSB and 3rd LSB	
	iv) The output voltage for a digital input of 11011 and 10110	
b.	With a neat diagram, explain the operation of a R-2R ladder type digital to analog converter.	10
3 a.	Define strain gauges and classify different types of strain gauges.	10
b.	What are the factors required while selecting a transducers?	6
c.	What is the thermistor? Mention its advantages.	4
4 a.	Describe the operation of piezo-electric transducers.	6
b.	Explain the operation of photo-transistor with an application.	4
c.	Explain the construction, principle, and operation of Linear Variable Differential Transducers (LVDT).	10
5 a.	Expalin the static charecterstics of an instrument.	10
b.	The expected value of the current through a resistor is 20 mA. However the measurement yields a current value of 18 mA. Calculate;	10
	i) Absolute error ii) %age error	
	iii) Relative accuracy iv) %age accuracy	
6 a.	Calculate the value of multiplier resistance for the multiple range dc voltmeter circuit shown in the figure.	
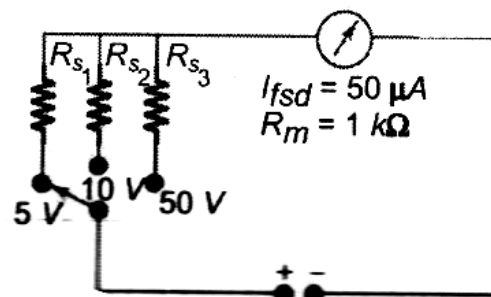
		10
b.	With a neat diagram, explain the operation of a True RMS voltmeter.	10

7	a.	With necessary waveforms and block diagram, explain the working of a ramp type DVM.	10
	b.	With necessary waveforms and block diagram, explain the working of a successive approximation type DVM.	10
8	a.	Explain the working of a digital multimeter with neat block diagram.	10
	b.	Explain the working of a digital frequency meter with neat block diagram.	10
9	a.	List any five ideals Op-amp electrical characteristics.	5
	b.	Draw an Op-amp inverting amplifier with feedback and derive its closed loop voltage gain.	5
	c.	Explain the working of an electronic-aided measurment with a neat block diagram.	10
10	a.	The chart speed of a recording instrument is 40 mm/s. One cycle of the single is recorded over 5 mm. Determine the frequency of the signal.	5
	b.	How is speed of the paper through the recorder is determined? Why paper speed is an important cosideration? Give reasons.	5
	c.	Explain the working of a strip chart recorder with a neat block diagram.	10

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