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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

Electronic Instrumentation

Time: 3 hrs

Max. Marks: 100

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

UNIT - I

- 1 a. Explain how Gross Errors and systematic errors can be minimized? 5
- b. Calculate the precision of 5th measurement for the given set of measured value in Table 1b.

Table 1b

Measurement number	Measured value
1	49
2	51
3	50.5
4	48.5
5	50.5
6	50
7	51.5
8	49
9	53
10	49.5

- c. Explain the ramp type digital voltmeter with the help of a block diagram. 10
- 2 a. List and explain the dynamic characteristics of an instrument. 6
- b. Design a multi range voltmeter by converting a basic D'Arsonval movement with an internal resistance of 75 Ω and a full scale deflection of 1 mA with voltage ranges of 0 - 10 V, 0 - 75 V, 0 - 100 V and 0 - 250 V. 6
- c. Explain the principle of operation of an integrating type digital voltmeter with the help of a block diagram. 8

UNIT - II

- 3 a. List any two limitations and applications of Wheatstone bridge. 4
- b. Explain the operation of Maxwell's bridge and derive the equation $Q = WCR$. 10
- c. Calculate the current through the Galvanometer for an Unbalanced Wheatstone bridge as shown in Fig. 3C.

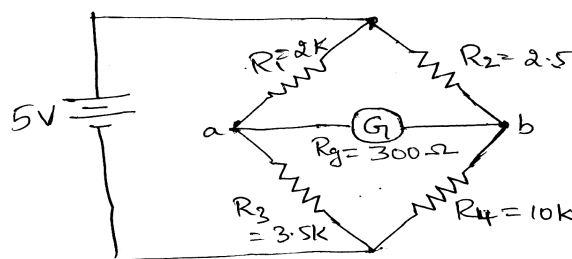
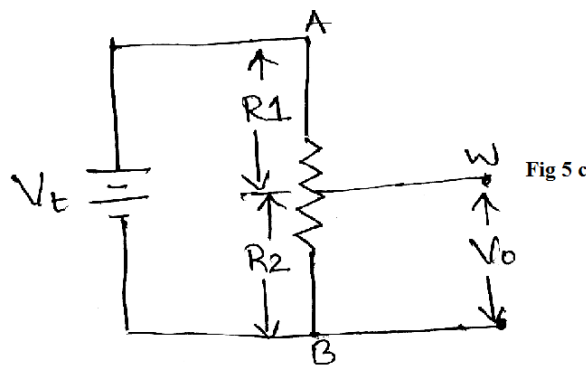


Figure 3C

- 4 a. Explain the operation of Schering's bridge with the help of circuit diagram and equations. 10
- b. Describe how microprocessors are reducing the cost and complexity of analog measurements? 4
- c. Describe the working of Inductive comparison bridge with a circuit diagram. 6

UNIT - III

- 5 a. List any six advantages of electrical transducers. 6
- b. Explain the working principle of capacitive transducer with a neat diagram and required expressions. 10
- c. A displacement transducer with a shaft stroke of 6.0 inch is applied to the circuit as shown in Fig. 5 C. The total resistance of the potentiometer is 10 kΩ. The applied voltage is 10 V. When the wiper is 1.8 inch from 'B' What is the value of the output voltage.



- 6 a. Differentiate between active and passive transducer. 4
- b. Explain the working principle of thermistor. Mention four advantages of thermistor. 8
- c. List and explain any eight advantages of LVDT. 8

UNIT - IV

- 7 a. What is an instrumentation amplifier? List and explain any four features of instrumentation amplifier. 10
- b. Explain with a neat block diagram the generalized Data Acquisition System (DAS) 10
- 8 a. Explain with a neat block diagram the working principle of spectrum analyser. 10
- b. Explain the working of a heterodyne wave analyser with the help of a block diagram. 10

UNIT - V

- 9 a. With a neat diagram, explain the construction of a working of bistable storage CRT. 10
- b. List and explain eight applications of Digital Storage Oscilloscopes. 10
- 10 a. With the help of block diagram, explain how the frequency synthesizer operates by showing the waveforms at various points? 10
- b. With a neat diagram, explain the basic circuit of a function generator. 10

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