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Third Semester B.E. Degree Examination, May/June 2010
Electronic Instrumentation

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. Define the following terms as applied to an electronic instrument:
 i) Accuracy ii) Precision iii) Resolution (06 Marks)
 b. Explain the working of a true RMS voltmeter, with the help of a suitable block diagram. (06 Marks)
 c. Convert a basic D'Arsonval movement with an internal resistance of 50Ω and a full scale deflection current of 2 mA into a multirange dc voltmeter with voltage ranges of $0 - 10 \text{ V}$, $0 - 50 \text{ V}$, $0 - 100 \text{ V}$ and $0 - 250 \text{ V}$. (08 Marks)
- 2 a. Differentiate analog meters and digital meters. (04 Marks)
 b. Explain the principle of operation of a digital frequency meter with the help of a block diagram. (10 Marks)
 c. A $4\frac{1}{2}$ digit voltmeter is used for voltage measurements:
 i) Find its resolution ii) How would 12.98 V displayed on a 10 V range?
 iii) How would 0.6973 be displayed on 1 V and 10 V ranges? (06 Marks)
- 3 a. Draw the basic block diagram of an oscilloscope. Explain the function of each block. (08 Marks)
 b. Describe the following modes of operation available in a dual trace oscilloscope:
 i) ALTERNATE mode ii) CHOP mode. (06 Marks)
 c. Explain the operation of an electronic switch, with the help of a block diagram. (06 Marks)
- 4 a. With the help of a neat diagram, explain the working of sampling oscilloscope. (10 Marks)
 b. With the help of a neat block diagram, explain the operation of a digital storage oscilloscope. Mention the advantages. (10 Marks)

PART – B

- 5 a. Explain the working of AF sine and square wave generator. (10 Marks)
 b. With a block diagram, explain the working of pulse generator. (10 Marks)
- 6 a. What are the limitations of wheat stone's bridge? Derive the balance equation of Kelvin's bridge. (06 Marks)
 b. An unbalanced wheat stone's bridge is shown in Fig.Q6(b). Calculate the current through the galvanometer. (06 Marks)

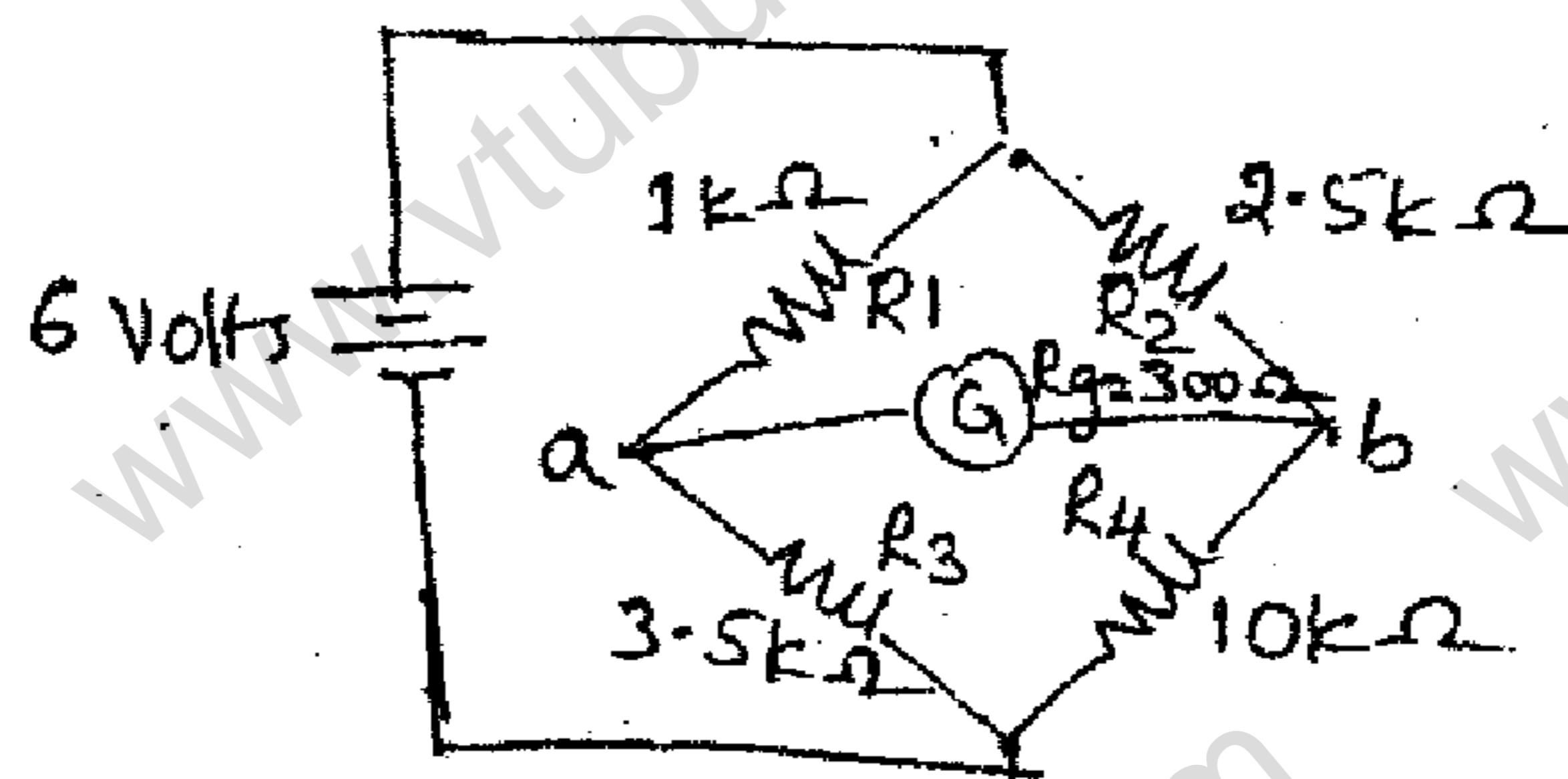


Fig.Q6(b)

- c. Derive the equation to measure an inductive impedance of a Maxwell's bridge. Also find the series equivalent of the unknown impedance if the bridge constants at balance are $C_1 = 0.01 \mu\text{F}$, $R_1 = 470 \text{ k}\Omega$, $R_2 = 5.1 \text{ k}\Omega$ and $R_3 = 100 \text{ k}\Omega$. (08 Marks)
- 7 a. What is gauge factor? Derive appropriate relation for the same. (10 Marks)
 b. Explain the construction, principle and operation of LVDT. Show characteristic curves. How is the direction of motion determined? (10 Marks)
- 8 a. Explain important features of LCDs. (06 Marks)
 b. Explain how power is measured, using a suitable bolometer bridge diagram. (06 Marks)
 c. Write a short note on signal conditioning system. (08 Marks)