

Third Semester B.E. Degree Examination, Dec.2016/Jan.2017
Electrical and Electronic Measurements and
Instrumentation

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1 a. Derive the dimensional equations for pole strength, current, mmf in the e.m. system of units. (06 Marks)
- b. Draw the circuit of a Kelvin's double bridge used for the measurement of low resistances. Derive the condition for balance. (07 Marks)
- c. Describe the working of a megger. (07 Marks)
- 2 a. Describe the working of Schering bridge. Derive the equation for capacitance and dissipation factor. Draw the phasor diagram of the bridge under conditions of balance. (12 Marks)
- b. A Maxwell's inductance comparison bridge is shown in Fig.Q.2(b). Arm ab consists of a coil with inductance L_1 and resistance r_1 in series with a non-inductive resistance R . Arm bc and ad are each a non-inductive resistance of 100Ω . Arm cd consists of standard variable inductor L of resistance 32.7Ω . Balance is obtained when $L_2 = 47.8$ mH and $R = 1.36\Omega$. Find the resistance and inductance of the coil in arm ab. (08 Marks)

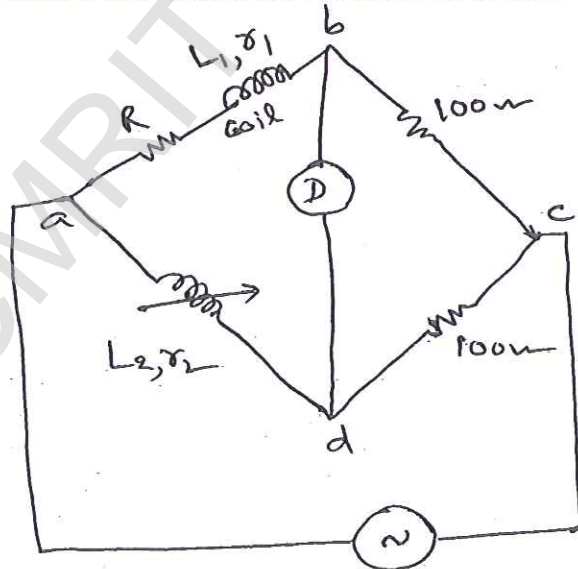


Fig.Q.2(b)

- 3 a. Explain Silsbees's method of testing of C.T. Derive necessary equations. (12 Marks)
- b. A 1000/5 A, 50Hz current transformer has a secondary burden comprising a non inductive impedance of 1.6Ω . The primary winding has one turn. Calculate the flux in the core and ratio error at full load. Neglect leakage reactance and assume the iron loss in the core to be $1.5W$ at full load. The magnetizing mmf is $100A$. (08 Marks)

- 4 a. With the help of sketch, explain principle and working of dynamometer wattmeter. (10 Marks)
b. Explain construction and working of induction type energy meter. (10 Marks)

PART – B

- 5 a. Explain construction and working of Weston frequency meter. (10 Marks)
b. Explain construction and working of electronic multimeter. (10 Marks)
- 6 a. Explain the method of Lissajous patterns used for frequency measurement. (10 Marks)
b. With a neat block diagram, explain the working of a digital storage oscilloscope. (10 Marks)
- 7 a. Explain working principle of LVDT with the help of neat sketch and characteristics. (12 Marks)
b. Explain different strain gauges with their principle of operation. (08 Marks)
- 8 a. Explain with block diagram the essential functional operation of a digital data acquisition system. (10 Marks)
b. What is a X-Y recorder? Explain with neat diagram the working of X-Y recorder. (10 Marks)

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