BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BTECH **SEMESTER : III**
BRANCH: EEE **SESSION : MO/19**

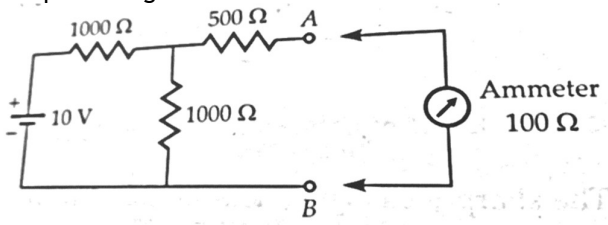
SUBJECT: EE201 ELECTRICAL MEASUREMENT AND INSTRUMENTATION

TIME: 3 HOURS **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a) Classify systematic errors and explain each type? [5]

Q.1(b) It is desired to measure the value of current in the 500 Ω resistor as shown in figure by connecting a 100 Ω ammeter. Find the percentage error in measurement and the accuracy? [5]

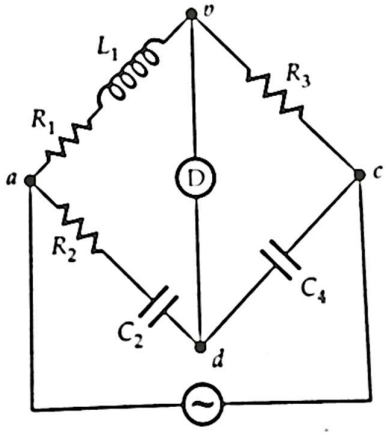


Q.2(a) Derive the deflection torque and deflection angle equation of M.I instrument? [5]

Q.2(b) The coil of a moving coil voltmeter is 40 mm long and 30 mm wide and has 100 turns on it. The control spring exerts a torque of 240×10^{-6} N-m when the deflection is 100 divisions on full scale. If the flux density of the magnetic field in the air gap is 1.0 Wb/m^2, estimate the resistance that must be put in series with the coil to give one volt per division. The resistance of the voltmeter coil may be neglected? [5]

Q.3(a) How do we detect location of cable faults? Explain with the method of Varley loop test? [5]

Q.3(b) For the bridge shown in the figure a unknown specimen is connected across arm ab, arm bc is R_3 = 100 Ω, arm cd is C_4 = 0.1 μF and arm da is R_2 = 834Ω in series with C_2=0.124 μF. Find the impedance of the specimen? [5]



Q.4(a) Draw and explain the block diagram of dual trace oscilloscope? [5]

Q.4(b) What are Lissajous patterns? Draw Lissajous patterns with different phase shifts keeping frequency and voltage constant? Explain the formation of one pattern? [5]

Q.5(a) Explain the construction and working principle of LVDT? Explain how the magnitude and direction of displacement of core of an LVDT detected? [5]

Q.5(b) Describe the construction, principle of working and applications of Hall Effect transducers? [5]

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