Name of the Examination: B.E. INFORMATION TECHNOLOGY FIRST YEAR
SECOND SEMESTER-2017
SUBJECT: ELECTRICAL MEASUREMENTS *TIME: 3 HOURS* *FULL MARKS: 100*

Instructions: SECTION: A is compulsory. Answer any 03 (Three) questions from SECTION: B.
Answer any 01 (One) question from SECTION: C

SECTION: A

1. a. Describe the operation of a Schering Bridge, also find the value of Loss angle with proper phasor diagram.
   b. An AC bridge has following constants:

   AB: Capacitor of 0.5 μF in parallel with 1kΩ resistance

   AD: Resistance of 2kΩ

   BC: Capacitance of 0.5 μF

   CD: Unknown Capacitor C_x and resistance R_x in series

   Determine C_x & R_x 15+10=25

SECTION: B

2. a. Find the unknown inductance using Maxwell's Bridge method.
   b. The four arms of a bridge network are as follows:

   ab: A resistor of 50 Ω in parallel with an inductor of 0.1H

   bc: A resistor of 100 Ω

   cd: An unknown resistor R in parallel with an unknown capacitor C

   da: A resistor of 1000 Ω

   A 50Hz voltage supply is applied across arm ac. Find the unknown resistance and capacitance when a galvanometer connected across arm bd is undeflected. 8+12=20

3. a. Explain the calibration of an electrical instrument.
   b. Describe different types of torque present in an electrical instrument.
   c. Why voltmeter has high resistance present in the instrument ?
   d. Explain different damping conditions of the pointer of an indicating instrument.
   e. what are the merits and demerits of an analog instrument over a digital one? 3+5+2+6+4=20

4. a. Describe the operating principle of a PMMC instrument.
   b. Find the value of different torques of a PMMC instrument.
   c. What are the advantage and disadvantage of a PMMC instrument ?
   d. Explain different types of errors that are encountered during operation of a PMMC instrument.
   5+8+5+2 =20

5. Write short notes on the following topics in brief **(Any Four)**   **5x4=20**
   a. Classification of different instruments.
   b. Compare the advantages and limitations of mechanical and electrical system.
   c. Comparison between ammeter and voltmeter.
   d. Application of instruments.
   e. Basic principal of AC bridge

SECTION: C

6. a. Find an unknown resistance using Kelvin's Double bridge method.
   b. A Kelvin bridge is balanced with the following constants: outer ratio arm 100 Ω and 1000 Ω inner arms' ratio 99.92 Ω and 1000.6 Ω. Resistance of link 0.1 Ω and standard resistance 0.00377 Ω. Calculate the value of unknown resistance.   **8+7=15**

7. a. Find the value of time constant in an RLC circuit
   b. Show that emissivity of plate is inversely proportional with the difference the steady state temperature and the temperature of the surrounding.   **. 9+6=15**