Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

THIRD SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.)

END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: ELECTRICAL & ELECTRONIC MEASUREMENTS [ICE 2102]

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A. The voltages at opposite ends of 470Ω, ±5% resistor are measured as V_1 =12V and V_2 = 5V. The measuring accuracies are ±0.5V for V_1 and ±2% for V_2. Calculate the level of current and specify its accuracy. Also calculate the power dissipated in the resistor when the same current is displayed by the ammeter with the 2% accuracy. Determine the accuracy of the result. **4**

1B. Derive the expressions for Inductance and its internal resistance using Anderson's bridge. Also draw the phasor diagram. **4**

1C. Define resolution and precision of an instrument **2**

2A. The four arms of a bridge network are made up of as follows. **5**

AB and BC 1000 Ω and 1250 Ω respectively. CD unknown impedance. DA standard capacitance 0.1 μF connected in series with the 10 Ω to give balance. The supply voltage is 15 V, 1000 Hz is given at the points B and D. Find components of unknown impedance.

2B. What are the errors that are likely to occur in Single phase induction type energy meter? How they are compensated. **3**

2C. Explain sampling and Hold in context with digital storage oscilloscope. **2**

3A. Draw the block diagram of CRO. Brief the functions of blanking circuit and delay lines. **5**

3B. With block and timing diagram, explain the working of Digital Frequency meter. **3**

3C. With the signal generator frequency of a Q meter set to 1.25 MHz, the Q of a coil is measured as 98 when C=147pF, Determine the coil inductance and resistance. **2**

4A. With necessary figures explain recording and read out process of optical recording. **5**

4B. With diagram describe the working of LCR meter **3**

4C. Brief about Range changing in DVM. **2**

5A. With block diagram elaborate the working of spectrum analyser. **5**

5B. With the help of circuit diagram explain working of OPAMP based regulated power supply. **5**

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