Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

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

END SEMESTER EXAMINATIONS, DEC 2016/JAN 2017

SUBJECT: ELECTRICAL AND ELECTRONIC MEASUREMENTS [ICE-2102]

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. Derive expressions for unknown inductance and its internal resistance using Maxwell-Inductance-capacitance bridge with phasor diagram. **5**

1B. Define the following terms as applied to the measuring instrument: **3**

i) Linearity ii) Sensitivity iii) Hysteresis.

1C. An unknown capacitor bushing forms an arm AB of a Schering Bridge and a standard capacitor of 500 pF capacitance and negligible loss forms an arm AD. Arm BC consists of a non-inductive resistance of 300Ω. When the bridge is balanced, arm CD has resistance of 72.6Ω in parallel with a capacitance of 0.148μF.The supply frequency is 50Hz. Calculate the capacitance and dielectric loss angle of the capacitor. **2**

2A. With neat diagram describe the working of 3 phase Induction type energy meter. **5**

2B. Draw the block diagram of dual trace oscilloscope. What is the difference between chop mode and alternate mode? **3**

2C. If the horizontal frequency is 100Hz. Determine the unknown frequency for the Lissajous pattern shown in Fig.Q. 2C. **2**

3A. Write the difference between LCD and LED. With neat figures explain the working of LCD. **5**

3B. Draw the block diagram and timing diagram of sampling oscilloscope and brief about its working. **5**

4A. With the diagram describe the working of potentiometric type DVM. **5**

4B. What is Q factor of coil? The Q-meter circuit is in resonance when, E=200 mV, R=3Ω and $X_L=X_C=95\Omega$. Calculate the coil Q and the voltmeter indication. **3**

4C. Draw the block diagram of Digital Storage Oscilloscope. **2**

5A. Explain recording of data using galvanometric recorder. **4**

5B. With neat figure explain the working of Swept Super heterodyne spectrum Analyzer. **4**

5C. Draw the block diagram of DC Regulated power supply **2**

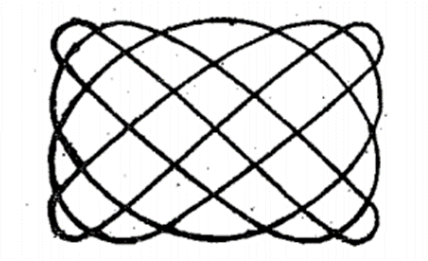

FIG. Q. 2C

****