Code: EE4T4

II B.Tech - II Semester – Regular/Supplementary Examinations – April 2017

ELECTRICAL MEASUREMENTS AND INSTRUMENTATION
(ELECTRICAL & ELECTRONICS ENGINEERING)

Duration: 3 hours   Max. Marks: 70

PART – A

Answer **all** the questions.   All questions carry equal marks

11 x 2 = 22

1.
   a) Discuss the various errors in moving iron instruments and suggest method to compensate these errors.
   b) Why ordinary watt meters are not suitable for low power factor circuits?
   c) Write the different Torques produced in PMMC instrument?
   d) What is phase angle error and on which factors it depends.
   e) "Never open the secondary ckt of a current transformer while its primary is energized" justify.
   f) Write a note on resonance type frequency meter.
   g) What are the advantages and disadvantages of moving iron power factor meter?
   h) What is sensitivity of wheat stone's bridge.
   i) Draw the circuit diagram of H.V Schering Bridge.

j) What is a Transducer?

k) The lowest range on a 4 - ½ digit digital voltmeter is 10mv full scale. What is the sensitivity of the meter?

PART – B

Answer any **THREE** questions.   All questions carry equal marks.

$$3 \times 16 = 48 \text{ M}$$

2. a) What is PMMC instrument? Explain with a neat sketch working of such an instrument when used as an ammeter.
8 M

   b) Explain the theory and operation of single phase energy meter. Derive the expression for the total number of revolutions.
8 M

3.   Draw the equivalent circuit and phasor diagram of a current transformer. Derive the expression for ratio and phase angle error.
16 M

4. a) Explain the construction and working of a 3∅ rotating field power factor meter.
8 M

   b) Write short notes on:
8 M
   i) Single phase power factor meter
   ii) Ratiometer type frequency meter

5. a) Find the values of R_x and L_x for the bridge shown below.

8 M
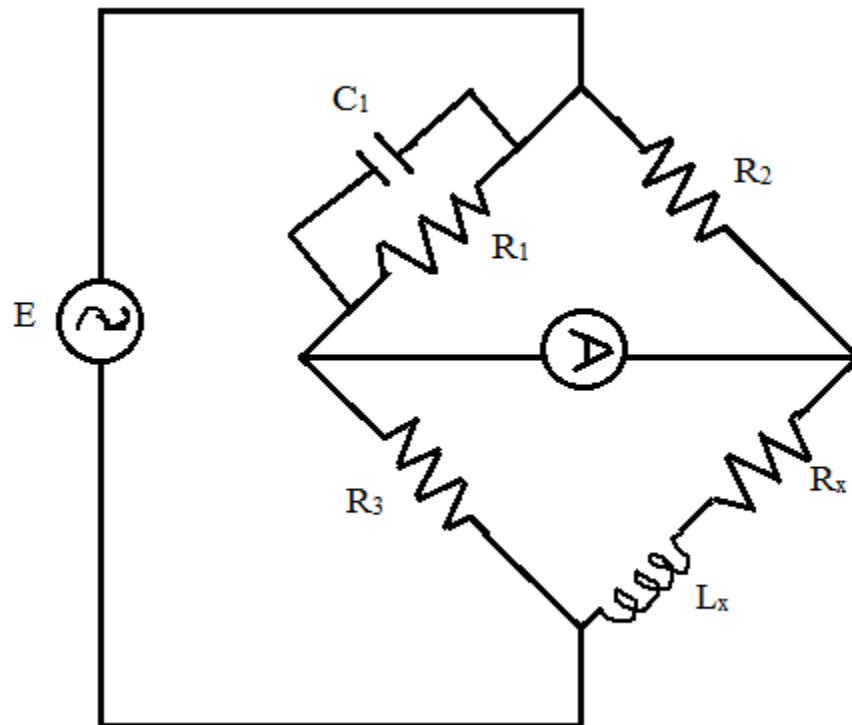
$R_1=1200\Omega$, $C_1=0.5\mu F$, $R_2=700\Omega$, $R_3=300\Omega$

b) Explain working of Carey-Foster slide wire with neat circuit diagram.

8 M

6. a) Discuss in detail operation of LVDT.

8 M

b) Explain the integrating type digital voltmeters with the block diagram.

8 M