PVP 14

Code: EE4T4

II B.Tech - II Semester – Regular/Supplementary Examinations
April 2018

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) Classify various damping control methods.
b) Explain how to increase range of voltmeter.
c) What is phantom loading?
d) Explain ratio error.
e) Enlist applications of potential transformers.
f) List out various parts in moving iron power factor meter.
g) What is the disadvantage of reed type frequency meter?
h) How would you measure high resistance?
i) Suggest a suitable bridge to measure inductance with high Q coil.
j) Can you propose an alternative of thermocouple?
k) What is the function of digital frequency meter?

PART – B

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

3 x 16 = 48 M

2.a) Describe the construction and working of PMMC instrument. Derive the equation for deflection if the instrument is spring controlled. Describe the method of damping used in these instruments. Discuss their advantages and disadvantages. 8 M

b) Discuss briefly the essential features of indicating instruments. 8 M

3.a) Derive the equivalent circuit and phasor diagram of a current transformer. Derive the expressions for its ratio and phase angle errors. 8 M

b) A current transformer has a single turn primary and 400 secondary turns. magnetizing current is 90A. While Core Loss current is 40A. Phase angle is 28°. Calculate actual primary current and % ratio error when secondary carries 5A current? 8 M

4.a) Explain the construction and working of a 3-phase rotating field power factor meter. Prove that the deflection of moving system is equal to the phase angle of the system. Explain the advantages and disadvantages of moving iron type power factor meters. 8 M

b) What are the different methods of measurement of frequency in the power frequency range. Explain the working of a mechanical resonance type frequency meter. 8 M

5.a) Draw circuit diagrams and phasor diagrams of Hay's bridges under balanced conditions. Also derive equations under balanced conditions. 8 M

b) The four arms of a Wheatstone bridge are as follows: AB=100 Ω; BC=10 Ω; CD=4 Ω and DA=50 Ω. The galvanometer has a resistance of 20 Ω and is connected across BD. A source of 10V d.c. is connected across AC. Find the current through galvanometer. What should be the resistance in the arm DA for no current through the galvanometer. 8 M

6.a) Explain principle of transducer with an example. 8 M

b) Explain about bidirectional meters with an example. 8 M