(Pages : 3) **A – 4188**

Reg. No. : .....

Name : .....

Fourth Semester B.Tech. Degree Examination, June 2016
(2013 Scheme)
13.404 : ELECTRICAL MEASUREMENTS AND MEASURING INSTRUMENTS (E)

Time : 3 Hours Max. Marks : 100

Instruction : *Answer **all** questions from Part **A** and **one** question from **each** Module in Part **B**.*

PART – A **(10×2=20 Marks)**

1. What are the three general classes of errors ?
2. What is the major cause of creep ?
3. What are the advantages of flux meter ?
4. What are the differences between CT and PT ?
5. What is the use of detectors in bridge circuits ?
6. How is the electron beam focused to a fine spot on the face of the cathode ray tube ?
7. Describe X-Y mode of operation of a CRO.
8. Define impulse puncture voltage.
9. What are the advantages of resistance potential divider method ?
10. What is meant by Hall Effect ?

PART – B **(4×20=80 Marks)**

Module – I

11. a) Describe the types of errors occurred in wattmeter. **10**

    b) Discuss the procedure to compensate these errors. **10**

OR

12. a) With a neat phasor diagram explain the working principle of single phase induction type energy meter. 10

b) A 240 V, 5 A, single phase energy meter has a registration constant of 1200 revolutions per kWh. It is tested by means of a 240 V, 5 A wattmeter having 500 scale divisions which can be read to 0.1 division and a stop watch which can be read to 0.01 second and which has negligible error. When tested at full load, the meter makes 40 revolutions in 99.8s. If the human error in timing be taken as ± 0.05s, estimate the limits within which the error of the meter may lie. The wattmeter is accurate to within 0.05 percent of its full scale reading. 10

Module – II

13. a) Derive the expression for logarithmic decrement factor of a galvanometer. 10

b) Explain how iron loss is obtained by Lloyd Fisher Square method. 10

OR

14. a) Bring out the need for shunt in a flux meter. 10

b) The magnetizing current of a ring core current transformer of ratio 1000/5 A when operating at full primary current with a secondary burden of non-inductive resistance of 1Ω is 1 A at a power factor of 0.4. Calculate i) the phase displacement between primary and secondary currents. ii) the ratio error at full load, assuming that there has been no compensation. 10

Module – III

15. a) With a neat diagram explain the procedure to measure the unknown capacitor using Schering bridge. 10

b) Explain the principle of delayed sweep in horizontal deflection system. 10

OR

16. a) A current of 10 A at a frequency of 50 Hz passed through the primary of mutual inductor having a negligible phase defect. The voltage of primary and secondary terminals were measured on a co-ordinate potentiometer with secondary open circuited : secondary voltage = $-2.72 + j\,1.57$ V, primary voltage = $-0.211 + j0.352$ V with secondary short circuited : primary voltage = $-0.051 + j0.329$ V. The phase of primary current relative to the potentiometer current was same in both the tests. Determine the resistances and self inductances of the two windings. Find also the mutual inductance. 10

b) With a neat diagram explain how voltmeter and ammeter are calibrated using a potentiometer. 10

Module – IV

17. a) Explain loss charge method to find the insulation resistance. 10

b) Describe the procedure to determine the resistivity of earth. 10

OR

18. a) Explain the basic operation of impulse generator circuit. 10

b) Enumerate the merits and demerits of different impulse generators used in high voltage measurements. 10