VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD
B.E. (E.E.E.) II Year I-Semester (Main & Backlog) Examinations, Nov./Dec.-2016

Electrical Measurements and Instruments

Time: 3 hours   Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

1. What do you understand by error, relative error and precision?

2. Classify the measuring instruments.

3. What are the four systems used in energy meter?

4. What is creeping in energy meter?

5. What are the various types of detectors used in AC bridges?

6. What is the function of Wagner's Earthing device?

7. What is leakage factor in DC machines?

8. Compare ballistic galvano meter and flux meter.

9. What is meant by standardization of potentio meter?

10. What are the advantages of instrument transformers?

Part-B (5 × 10 = 50 Marks)

11. a) Derive the torque equation of a moving iron instrument.   [5]

    b) Explain shunt and multiplier used for the extension of the range of an instrument.   [5]

12. a) Describe the construction and principle of operation of $1 - \emptyset$ energy meter.   [5]

    b) A 230 V, $1 - \emptyset$ energy meter has a constant load of 4 A passing through it for 6 hours at   [5]
       unity p.f.. If the meter disc makes 2208 revolutions, during this period, what is the meter
       constant? Calculate the p.f. of the load if the number of revolutions made by the meter are
       1472 when operating at 230V, 5A for 4 hours.

13. a) Explain the method of measurement of unknown inductance using Anderson's Bridge.   [6]

    b) A bridge has   [4]
       Arm AB : Unknown capacitance C_x and leakage resistance R_x
       Arm BC : Non-inductive resistance $R_2 = 100$ kΩ
       Arm CD : Non-inductive resistance $R_1 = 1.2$ kΩ
       Arm DA : Known standard capacitor $C_3 = 10$ μF in series with resistance $R_3 = 120$ kΩ.
       At the balance of the bridge. Find C_x and R_x values.

14. a) Explain the method of measuring iron loss using Lloyd- Fischer square.   [5]

    b) Explain the working of Ballistic galvano meter with suitable diagram.   [5]

15. a) With the help of vector diagrams obtain the expression for the ratio of a current transformer.   [6]

    b) A C.T. has a single turn primary and 400 secondary turns. The magnetizing current is 90A   [4]
       while core loss current is 40A. Secondary load phase angle is 28^0. Calculate the actual
       primary current, when secondary carries 5A current.

16. a) Derive the expression for torque equation for a Permanent Magnet Moving Coil instrument.   [5]

    b) Explain the working principle of a Weston type frequency meter.   [5]

17. Write short notes on any *two* of the following:

    a) Loss of charge method   [5]

    b) Determination of "H" of a Bar specimen.   [5]

    c) Measurement of resistance by D.C. potentiometer.   [5]

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