Hall Ticket Number:

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VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (E.E.E.) II Year I-Semester Backlog (Old) Examinations, December-2017

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. Match the following:

Type of the Instrument	**Application**
1) Moving Iron	a) DC only
2) PMMC	b) AC only
3) Dynamometer	c) Both AC and DC
4) Induction	d) Neither AC nor DC

2. List the Torque required for operation of Analogue instrument.
3. What is meant by Phase error in connection with Energy Meter?
4. A 230 V single phase energy meter has a constant load of 4 Amps passing through it for 5 hours at unity power factor. If the meter makes 1104 revolutions during this period. What is the meter constant?
5. Which bridge do you prefer for measurement of the resistance of an Ammeter? Why?
6. Maxwell's bridge is not recommended for measurement of the inductance of a coil having high quality factor. Why?
7. What is meant by the calibration of a Ballistic galvanometer?
8. Sketch, flux density – magnetising force relation with a curve.
9. A standard cell of 1.0185 V used with a simple Potentiometer balances at 50cm. Calculate the percentage error in voltmeter which balances at 64.5cm when reading 1.33V.
10. Explain, How to measure Amplitude of an AC sinusoidal signal with the help of a CRO?

Part-B (5 × 10 = 50 Marks)

11. a) Derive the expression for deflecting torque of a Moving Iron Ammeter. Explain the shape of scale. [5]

    b) The resistances of the two coils of a wattmeter are 6000 Ω and 0.03 Ω. Calculate the percentage error, if the wattmeter is so connected that the pressure coil is on the load side, if the load takes 20 A at a voltage of 220 V at 0.6 power factor? [5]

12. a) With the help of neat diagram, Explain the working principle of single phase induction type Energy meter. [5]

    b) With the help of neat diagram, Explain the working of Weston type of synchroscope. [5]

13. a) How do you measure medium value of resistance by Wheatstone bridge? Explain. [4]

    b) With the help of neat diagram, Explain the working principle of Megger. [6]

14. a) Explain, how to determine the leakage factor of a Dc machine using flux meter? [4]

    b) Explain the Lloyd- Fischer square for measurement of iron loss? [6]

Contd... 2

15. a) What is meant by standardisation of a potentiometer? With the help of neat diagram. Explain the principle of operation of D.C. Crompton's Potentiometer. [6]

    b) A current transformer has a single turn primary and a 200 turns secondary winding. The secondary winding supplies a current of 5 A to a non – inductive burden of 1 ohm resistance. The requisite flux is set up in the core by an mmf of 80 A. The frequency is 50 Hz and the net cross section of the core is 1000 sq.mm. Calculate the ratio and phase angle errors of the transformer? [4]

16. a) Explain the basic construction and principle of operation of DVM. [5]

    b) With the help of neat diagram, Explain the working of Electrical resonance type frequency meter. [5]

17. Answer any *two* of the following:

    a) With the help of neat diagram, explain how to measure the resistance using Kelvin's double bridge. Derive the necessary equations? [5]

    b) Explain the basic construction and principle of operation of Flux meter. [5]

    c) Explain, how to calibrate an Ammeter using DC potentiometer? [5]

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