Code: 9A02501 **R09**

B.Tech III Year I Semester (R09) Supplementary Examinations December 2015

ELECTRICAL & ELECTRONIC MEASUREMENTS

(Electrical & Electronics Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

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1 (a) A moving coil carries a current of 50 mA and meter resistance is 50 ohm. Determine the value of shunt resistance required to extend the meter range up to 10 A. The series resistance required to measure voltage of 300 V.
(b) Draw neat diagram of repulsion type moving iron instrument and describe its principle of operation with torque equation.

2 (a) Define ratio error and phase angle error in CT. What is the effect of ratio error and phase angle error in measurement? What are the modifications required to reduce ratio error and phase angle error.
(b) Draw diagram of dynamometer type single phase power factor meter. Describe its principle of operation.

3 (a) What are the types of errors in wattmeter? What is the need of low power factor wattmeter? What are the special features of low power factor wattmeter?
(b) Draw neat diagram of single phase induction type energy meter and explain its operation with equation of driving torque and braking torque.

4 (a) Describe the procedure of standardization of potentiometer. Explain it can be used for measurement of unknown voltage.
(b) Describe the construction and working of polar type potentiometer. How is it standardized? What are the functions of transfer instrument and phase shifting transformer? Explain how unknown voltage can be measured using this pot.

5 (a) Draw neat diagram of Anderson's bridge and derive balance equation. Also draw phasor diagram.
(b) What are the limitations of Wheatstone bridge? How these limitations are overcome in Kelvin's double bridge? Derive balance equation of Kelvin's double bridge and draw neat diagram.

6 (a) Explain the separation of iron loss by neat diagram, mathematical equation and graph.
(b) Describe operation of Ballistic galvanometer with mathematical equation. What are the important constructional features of galvanometer for flux measurement?

7 (a) Describe how phase angle and frequency measurement can be made on CRO with Lissajous pattern.
(b) Describe the function of time base generator in CRO. Draw block diagram of CRO and explain function of each block.

8 (a) Describe ramp type digital voltmeter with block diagram.
(b) Draw block diagram of digital voltmeter and write down specifications.

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