Code: 9A02501 **R09**

B.Tech III Year I Semester (R09) Supplementary Examinations June 2017

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) Explain the working principle of moving iron type voltmeter and derive the expression for its deflecting torque and controlling torque.

(b) Briefly discriminate the different torque produced in measuring instruments.

2 From the fundamentals, derive the expressions for actual transformation ratio and phase angle of the potential transformer.

3 (a) What is meant by phantom loading? Describe how single phase energy meter is tested and calibrated with the help of RSS watt-hour meter.

(b) Show that the error caused by pressure coil inductance due to inductive load of the electro-dynamo type watt meter is VI $\sin\varphi$ $\tan\beta$.

4 (a) Describe the errors in the co-ordinate type a.c. potentiometer. Explain how an unknown voltage can be measured by using this potentiometer.

(b) Explain how the Crompton's potentiometer can be used for the measurement of unknown resistance and current.

5 (a) With the help of circuit diagram, explain how capacitance and dissipation factor is determined with Schering bridge.

(b) A Maxwell bridge is used to measure inductive impedance. The bridge consists at balance are R_1 = 47 kΩ and C_1 = 0.01 μF in arm AB, R_2 = 5.1 kΩ in arm BC, R_3 = 100 kΩ in arm AD. Find the unknown impedance.

6 (a) Describe the constructional details and working principle of flux meter.

(b) Explain method of separation of iron losses by varying frequency keeping the form factor constant with maintaining maximum flux density.

7 (a) Discuss how the measurement of frequency and phase is done with the help of CRO.

(b) Explain in detail, the applications of CRO.

8 List different types of DVM's. Explain the working of any two types with neat block diagram.

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