

Code: 9A02501

R9

B.Tech III Year I Semester (R09) Supplementary Examinations, May 2013

ELECTRICAL AND ELECTRONIC MEASUREMENTS

(Electrical & Electronics Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Explain why PMMC instruments are the most widely used instruments. Discuss their advantages and disadvantages.
(b) A moving coil instrument has a resistance of $12\ \Omega$ and gives a full scale deflection when carrying 50 mA. Show how it can be adopted to measure voltage up to 700 V and current 100 A.
- 2 (a) Explain the design features of current transformers that help to minimize the errors.
(b) The ratio error of a given 1000/5 A CT is zero when feeding 5 VA, UPF burden at rated current estimate the iron loss of the transformer at this operating condition if the secondary has 198 turns and winding resistance of $0.02\ \Omega$. Neglect leakage reactance.
- 3 Describe the constructional details and working principle of the single phase dynamometer wattmeter.
- 4 Describe the construction and working of a co-ordinate type AC potentiometer. How it can be standardized. Explain how an unknown voltage can be measured with it.
- 5 (a) Draw the circuit of a Kelvin's double bridge used the measurement of low resistance. Derive the condition for balance.
(b) State the advantages and disadvantages of Anderson's bridge.
- 6 (a) Write short notes on determination of B – H loop by method of reversals.
(b) The coil of a ballistic galvanometer has 115 turn of mean area $25 \times 40\ \text{mm}^2$ the flux density is the air gap is $0.12\ \text{Wb/m}^2$ and the moment of inertia is $0.5 \times 10^{-6}\ \text{Nm/rad}$. What current must be passes to give a deflection of 100° ?
- 7 Explain the measurement of phase, frequency, current and voltage by using cathode ray oscilloscope.
- 8 (a) Write brief notes on successive approximation type digital voltmeter.
(b) What is digital tachometer explain with neat diagram.
