12|18|17 (M) ①

ROLL No: [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]   Total number of pages:|2 |

Total number of questions: 06

B.Tech. || EE || 3rd Sem

Electrical Measurements

Subject Code: BTEE-303A

Paper ID: (for office use)

Time allowed: 3 Hrs   Max Marks: 60

Important Instructions:

- All questions are compulsory
- Assume any missing data

PART A (2×10)

Q. 1.	Short-Answer Questions:	All Cos
	(a) Derive dimensional formula of R, L in MLTI system.	
	(b) What are the parameters that can be measured by Wein's brisge?	
	(c) Define transformation ratio and burden of C.T.	
	(d) What is general equation of an A.C bridge?	
	(e) Why Kelvin's bridge is used to measure low resistance value?	
	(f) Draw the D.C potentiometer circuit.	
	(g) What is meant by creeping in energy meter?	
	(h) Write merits and demerits of moving iron instruments.	
	(i) A simple slide wire is used for the measurement of current in a circuit. The voltage across standard resistance of 1Ω is balanced at 75 cm. Find the magnitude of the standard cell having an e.m.f of 1.45 volts is balanced at 50cm.	
	(j) Draw the circuit of Wheatstone bridge with detail of parameters.	

PART B (8×5)

Q. 2.	Discuss construction, principle of operation and working of PMMC instruments.	CO3
	OR	
	a) Discuss the method to eliminate the sources of error in bridges. b) Explain the standards of measurement in detail.	CO3
Q. 3.	a) Prove that the following equation is dimensionally correct. $E=BLV$ B= flux density, L= length, V =velocity b) The arms of an a.c bridge are arranged as follows: Arm AB: $Z_1 = 100 <30°$ Ω, Arm arm BC : $Z_2= 50$ Ω, Arm AD : $Z_3 = 200<-90°$ Ω and Arm CD: $100<30°$. Determine whether it is possible to balance the bridge under above conditions.	CO3&CO4

	OR	
	a)) Explain the method of measurement of capacitance using Schering bridge. b) The following data relate to a1000/100 volts potential transformer: Primary resistance = 84.4 Ω, primary reactance = 62.5 Ω, secondary resistance = 0.78 Ω, total eq. reactance = 102 Ω and no lad current = 0.03 A at 0.42 power factor. Calculate i) phase angle error at no load ii) burden in VA at unity power factor at which the phase angle will be zero	CO3&CO4
Q. 4.	a) Derive the general torque equation for a moving iron instrument. b) Draw the phasor diagram of Current transformer and explain each term.	CO2
	OR	
	a) Describe the construction details and working of Induction type Energy meter. b) Discuss primary standard of E.m.f.in detail.	CO2
Q. 5.	a) Explain how a.c potentiometers can be used for measurement of reactance of a coil. b) What are the advantages of SI units?	CO1&CO2
	OR	
	a) Define the terms i) unit ii) dimension formula iii) supplementary units b) Write applications of D.C potentiometer. Explain in detail.	CO1&CO2
Q. 6.	a) Discuss constructional detail and working of d.c potentiometer. b) What is bridge? Classify filters in two main categories and name different type of bridges that are used specifying which parameter will be measured by them.	CO2&CO3
	OR	
	Short note on a) Wagner earth device b) Self balancing potentiometer	CO2&CO3