QP Code: RM21BTECH441 | Reg. No | | | | | | | | | | | AY 21

GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Sixth Semester Regular) Examinations, May – 2024

21BEEPC36001 – Electrical and Electronic Measurements

(EE & EEE)

Time: 3 hrs | Maximum: 70 Marks

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. What were the drawbacks of Kelvin's bridge due to which Kelvin's double bridge was designed?	CO1	K1
b. In a Wheatstone bridge P = 50 Ω, Q = 100 Ω and R = 20 Ω. If the galvanometer shows zero deflection, determine the value of S.	CO2	K3
c. How the phase angle is measured in polar type potentiometers?	CO3	K1
d. How the Errors in a C.T. can be minimised?	CO4	K1
e. What are the essential differences between a moving coil and a moving iron instrument?	CO4	K1

PART – B **(15 x 4 = 60 Marks)**

Answer ***ALL*** questions	Marks	CO #	Blooms Level
2. a. Explain about different torques works on PMMC instrument & Derive the torque equation.	7	CO1	K1
b. Two wattmeters are connected to measure the input power to a balanced 3-phase load by the two-wattmeter method. If the instrument readings are 8kW and 4kW, determine (i) the load power factor. (ii) Reactive power	8	CO1	K1
(OR)			
c. Describe the working principle of watt- hour meter & the errors associated with it.	7	CO1	K1
d. A PMMC has an internal moving-coil resistance of 100 Ω and gives full-scale deflection for 3 mA. Calculate the value of shunt resistance required to convert the PMMC meter into a DC ammeter with a range of 0 to 5 amperes.	8	CO1	K1
3.a. Draw the Maxwell's Inductance-Capacitance bridge and derive the expression for unknown inductance and effective resistance of the coil. Find the series equivalent of the unknown impedance for A Maxwell bridge is used to measure inductive impedance. The bridge constants at balance are: R1 = 470 k Ω, C1 = 0.01 mF, R2 = 5.1 k Ω and R3 = 100 k Ω	10	CO2	K2
b. Explain Wagner Earth device with proper circuit design.	5	CO2	K1
(OR)			
c. Derive an expression for the unknown parameter of a Schering bridge under balanced condition and Determine the unknown resistance and capacitance of the bridge circuit and dissipation factor for the following data, constants R1 = 1 k Ω, C1 = 0.5 mF, R2 = 3 k Ω and C3 = 0.5 mF at frequency 1 kHz	10	CO2	K1

d.	Which bridge is used for measurement of frequency and capacitance? Explain in detail.	5	CO2	K1
4.a.	Describe the working principle of D' Arsonaval type of galvanometer & derive the torque equation.	10	CO3	K1
b.	Describe the construction of Crompton type Potentiometer.	5	CO3	K2
	(OR)			
c.	Explain about different types of AC potentiometer and how it is different from DC potentiometer.	10	CO3	K1
d.	With neat diagram explain about vibration type galvanometer.	5	CO3	K1
5.a.	Explain about the working principle of a CT and solve the following question A 1000/5 A, 50 Hz CT has a secondary load burden comprising of non-inductive impedance of 1.6 ohm. The primary winding has 1 turn, iron loss is 1.5W, m.m.f = 100 AT. Calculate the flux in the core and the ratio error.	10	CO4	K1
b.	Give the comparison between CT and PT.	5	CO4	K2
	(OR)			
c.	A CT has a bar primary and 200 turns in secondary winding. The external burden consists of resistance and reactance as 1.2 ohm and 0.5 ohm respectively. The secondary winding has a resistance and reactance of 0.2 ohm and 0.3 ohm respectively. Iron loss is 50W and m.m.f is 100AT. Find the ratio error. Also find the primary current for a secondary current of 5A	10	CO4	K2
d.	Describe the working principle of CRO, explain about different functional units of CRO with neat diagram.	5	CO4	K2

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