QP Code: RD21BTECH103 | Reg. No | | | | | | | | | | | AR 21

GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Third Semester - Regular) Examinations, December – 2022

21BECPC23002 - Electrical and Electronic Measurements

(ECE)

Time: 3 hrs | Maximum: 70 Marks

Answer ALL questions

(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.	Determine the resolution of a moving coil voltmeter having a uniform scale with 50 divisions; the full-scale reading is 50 V and $1/10^{th}$ of a scale division can be estimated with a fair degree of certainty.	CO1	4
b.	Derive the balance condition of Wheatstone Bridge.	CO2	3
c.	Name the four intrinsic constants of a galvanometer.	CO3	2
d.	Mention the various types of error in wattmeters.	CO1	2
e.	What is the main cause of harmonic distortion?	CO4	1

PART – B **(15 x 4 = 60 Marks)**

Answer ***ALL*** questions		Marks	CO #	Blooms Level
2. a.	Describe the working principle of a Ballistic galvanometer with a necessary diagram.	8	CO1	2
b.	Explain briefly the terms: (i) Static error (ii) Sensitivity (iii) Hysteresis (iv) Drift (v) Accuracy (vi) Repeatability (vii) Linearity	7	CO3	2
	(OR)			
c.	Discuss the construction and principle of Electrical Resonance type frequency meter.	8	CO2	3
d.	Explain errors of current and potential transformer.	7	CO3	2
3.a.	Describe the loss of charge method for the determination of high resistance.	8	CO1	2
b.	Explain the construction and working of a simple D.C potentiometer.	7	CO4	1
	(OR)			
c.	Explain with a neat sketch, construction and operation of power-factor meter.	8	CO2	3
d.	Draw the block diagram of Real Time Spectrum Analyzer. Explain.	7	CO3	2
4.a.	A resistance of approximate value of 80 Ω is to be measured by voltmeter – ammeter method using a 1 A ammeter having a resistance of 2 Ω and a 50 V voltmeter having a resistance of 5 kΩ.	8	CO1	2
	i. Suggest which one of the two methods should be used.			
	ii. Suppose in the suggested method the following measurements are made: I = 0.42 A & V = 35.5 V			

What is the resulting error if the accuracy of the instruments is ± 0.5% at full scale and the errors are standard deviations.

b.	Derive the torque equation of PMMC instrument with a suitable constructional diagram.	7	CO4	1

(OR)

c.	A 3-phase, 10 kVA load has a PF of 0.342. The power is measured by two wattmeter method. Find the reading of each wattmeter when the PF is (i) Lagging and (ii) Leading	8	CO2	3
d.	Explain the working of a superheterodyne wave analyser.	7	CO3	2
5.a.	Derive the relationship between capacitance and resistance using Schering Bridge.	8	CO2	3
b.	What is essential difference between a moving coil and a moving iron instrument. List the errors with the methods of compensation.	7	CO4	1

(OR)

c.	Explain single phase induction type energy meters with its source of errors.	8	CO2	3
d.	Discuss the circuit diagram of basic wave analyser.	7	CO3	2

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