O.P.Code: 23EE0224 | R23 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. III Year II Semester Regular Examinations April-2026

ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

(Electrical and Electronics Engneering)

Time: 3 Hours **Max. Marks: 70**

PART-A

(Answer all the Questions **10 x 2 = 20** Marks)

1	a	Define Error.	CO1	L2	2M
	b	What are the types of forces in indicating instruments.	CO1	L2	2M
	c	Write the expressions for deflecting torque and controlling torque in a single-phase dynamometer wattmeter.	CO2	L2	2M
	d	What is phantom loading and why is it used in energy meter testing?	CO2	L2	2M
	e	Define low resistance and name one instrument used for its measurement.	CO3	L1	2M
	f	Compare Maxwell's bridge and Anderson's bridge for inductance measurement in terms of accuracy and components used.	CO3	L4	2M
	g	Define Digital Voltmeter (DVM).	CO4	L1	2M
	h	What is Q-meter?	CO4	L1	2M
	i	Define a transducer.	CO6	L1	2M
	j	State the principle of operation of LVDT.	CO5	L2	2M

PART-B

(Answer all Five Units **5 x 10 = 50** Marks)

UNIT-I

2	a	Define the terms "Indicating instruments", "Recording instruments" and integrating Instruments". Give examples of each.	CO1	L1	6M
	b	What are the different types of Ammeters and Voltmeters?	CO1	L1	4M
		OR			
3		Choose a design for Aryton shunt to provide an ammeter with the current ranges 1 A, 5 A and 10 A. The basic meter resistance is 50 ohm and full scale deflection current is 1 mA.	CO1	L5	10M

UNIT-II

4		Explain the constructional details of electro dynamometer type wattmeter with a neat sketch.	CO2	L2	10M
		OR			
5	a	Discuss the errors of single phase energy meter.	CO2	L2	5M
	b	Examine in a 50A , 230 V meter on full load test makes 61 revolutions in 37 seconds . If the normal disc speed is 520 revolutions per Kwh , find the percentage error .	CO2	L4	5M

UNIT-III

6	a	Explain classification of resistances. What are the different types of methods used for measurement of low, medium and high resistance?	CO3	L2	5M
	b	Draw the circuit diagram of a Wheatstone bridge and derive the condition for balance.	CO3	L3	5M
		OR			
7		Draw the circuit diagram of Schering Bridge. Derive the conditions for balancing the bridge.	CO3	L3	10M

UNIT-IV

8		Explain the working principle of dual-slope integrating type DVM with block diagram.	CO4	L4	10M
		OR			
9		Explain the applications of strain gauge in engineering measurements.	CO4	L3	10M

UNIT-V

10	a	What is a transducer? Explain classification of transducers.	CO6	L1	5M
	b	Explain the advantages of electrical transducer.	CO6	L2	5M
		OR			
11		Illustrate a Data Acquisition System (DAS) with a block diagram and explain the interfacing techniques used to connect sensors with PLC and SCADA systems.	CO5	L4	10M

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