Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech (Full Time) - END SEMESTER EXAMINATIONS, NOV/DEC 2025

Department of Electrical and Electronics Engineering

EE 5404 – Measurements and Instrumentation
(Regulation 2019)

Time:3 Hours **Answer ALL Questions** **Max. Marks100**

CO1	Able to understand the fundamental art of measurement in engineering.
CO2	Able to understand the structural elements of various instruments.
CO3	Able to understand the importance of bridge circuits.
CO4	Able to understand about various transducers and their characteristics by experiments.
CO5	Able to understand the concept of digital instrumentation and virtual instrumentation by experiments.

BL – Bloom's Taxonomy Levels
(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A(10x2=20Marks)
(Answer all Questions)

Q.No	Questions	Marks	CO	BL
1	A moving coil ammeter has a uniform scale with 50 divisions and gives a full-scale reading of 5 A. The instrument can read up to Vth of a scale division with a fair degree of certainty. Determine the resolution of the instrument in mA.	2	CO1	L2
2	Write the principle of deflection method of measurement	2	CO1	L1
3	List the merits and demerits of Electrodynamometer type instruments.	2	CO2	L2
4	List the differences between current transformer and potential transformer	2	CO2	L2
5	List the sources of errors in a Wheatstone bridge that may affect its precision while measuring medium range resistances.	2	CO3	L2
6	Draw the configuration of Wien's bridge and give the equation to find the unknown frequency.	2	CO3	L2
7	Write a short note on basic requirements of a transducer	2	CO4	L1
8	Why do immediate amplification not necessary in LVDT	2	CO4	L1
9	State Nyquist Sampling Theorem	2	CO5	L1
10	Mention the merits of digital meters over analog meters	2	CO5	L2

PART- B(5x 13=65Marks)

Q.No	Questions	Marks	CO	BL
11 (a)	Categorize and discuss the types of errors occurring in measurement system.	13	CO1	L4
	OR			

11 (b)	Discuss the static and dynamic characteristics of a measurement system	**13**	CO1	L3
12 (a)	How can the range of PMMC instruments can be extended	**13**	CO2	L4
	OR			
12 (b)	Explain the construction and working of moving iron instruments with neat diagram	**13**	CO2	L3
13 (a)	Describe the low resistance measurement with its respective bridge and derive its equation under balanced condition	**13**	CO3	L3
	OR			
13 (b)	Explain the configuration and phasor diagram of Maxwell's Inductance bridge for the measurement of unknown self-Inductance	**13**	CO3	L3
14 (a)	Explain the temperature measurement using resistive principle	**13**	CO4	L3
	OR			
14 (b)	Describe the pressure measurement with capacitive principle	**13**	CO4	L3
15 (a)	Discuss the measurement of frequency with Lissajous pattern	**13**	CO5	L3
	OR			
15 (b) (i)	Discuss the operation of DSO with neat diagram	**7**	CO5	L3
(ii)	Describe the operation of digital Multimeter	**6**		

PART- C(1x 15=15Marks)

(Q.No.16 is compulsory)

Q.No	Questions	Marks	CO	BL
16.	Discuss the Ramp and Dual Slope Integrating type Digital Voltmeter	**15**	CO5	L5