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

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B. Tech. (Full Time) END SEMESTER EXAMINATIONS, APRIL / MAY 2024

ELECTRONICS AND COMMUNICATION ENGINEERING BRANCH

Professional Elective

EC5020 – MEASUREMENTS AND INSTRUMENTATION

(Regulation 2019)

Time: 3 Hours | Max.Marks:100

CO 1	Discuss about the principles of various measurement techniques.
CO 2	Analyze the transducers and its impact.
CO 3	Explain about the signal conditioning system and signal analyzers.
CO 4	Illustrate the digital measurement equipments.
CO 5	Emphasize the need for data acquisition, recording and display systems.

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

PART- A (10 x 2 = 20 Marks)
(Answer all Questions)

Q. No	Questions	Marks	CO	BL
1	Define primary standards.	2	CO1	L1
2	List the types of electrical standards.	2	CO1	L1
3	Draw the schematic of linear strain gauge.	2	CO2	L2
4	List the demerits of inductive transducer.	2	CO2	L2
5	Draw the transition mode waveform of logic analyzer.	2	CO3	L2
6	Draw the schematic of isolation amplifier.	2	CO3	L2
7	List the elements of an electronic multimeter.	2	CO4	L1
8	Why is multimeter called VOM?	2	CO4	L1
9	Write the equation for voltage rise for horizontal deflection system.	2	CO5	L1
10	Mention the demerits of digital recorders.	2	CO5	L1

PART- B (5 x 13 = 65 Marks)
(Restrict to a maximum of 2 subdivisions)

Q. No	Questions	Marks	CO	BL
11 (a)	Explain the various errors that occur in a measurement system.	13	CO1	L3
	OR			
11 (b)	Draw the cross sectional view of a double-walled resistance standard. Explain the potentiometer method of calibration.	13	CO1	L3
12 (a)	Illustrate the schematic of thermocouple and mention its applications. Explain the construction of a capacitive transducer.	13	CO2	L4
	OR			
12 (b)	Draw and explain the characteristics of thermistor. Explain its application as an incubator.	13	CO2	L4

13 (a)	Draw the functional block diagram of heterodyne wave analyzer. Analyze the Thevenin's circuit for basic operation of Wheatstone bridge.	**13**	CO3	L3
	OR			
13 (b)	Draw the block diagram of general purpose spectrum analyzer. Draw the precision loop circuit of first LO of spectrum analyzer.	**13**	CO3	L3
14 (a)	Draw the basic block diagram of a frequency counter and waveforms associated with gating function. Draw the schematic representation of an open collector IEEE 488 bus transceiver.	**13**	CO4	L4
	OR			
14 (b)	Draw the block diagram of a staircase-ramp DVM.	**13**	CO4	L4
15 (a)	Explain the function of each block of DSO using an analog delay line.	**13**	CO5	L3
	OR			
15 (b)	With a neat diagram explain the architecture of virtual instrumentation and discuss its uses in various fields.	**13**	CO5	L3

PART- C (1 x 15 = 15 Marks)

(Q.No.16 is compulsory)

Q. No	Questions	Marks	CO	BL
16 (i)	Draw the block diagram of a successive approximation DVM.	**7**	CO4	L5
(ii)	Draw the circuit diagram of two-stage attenuator for a high frequency oscilloscope.	**8**	CO5	L6