Name:.....
Roll No:.....

MAR ATHANASIUS COLLEGE OF ENGINEERING
KOTHAMANGALAM – 686666
(Govt. Aided Autonomous Institution)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B. TECH FIRST SERIES EXAMINATION, AUGUST 2026

(S5 ECE A & B) B24EC3P12 INSTRUMENTATION AND INDUSTRIAL AUTOMATION

Max. Marks: 40 Duration: 1.5 Hours

PART A

Answer all questions. Each question carries 3 marks.

1. Illustrate the working of a basic measurement system with a neat block diagram. (CO1)

2. A spring balance has its deflection measured for a number of loads and gave the following results. Determine its sensitivity. (CO1)

Load in Kg	0	1	2	3	4
Deflection in mm	0	10	20	30	40

3. An automated machine uses an encoder to monitor the rotation of a motor shaft. Explain the method used to calculate the angular position from the encoder output. (CO2)

4. What is the purpose of an orifice plate in a sensor system? (CO2)

PART B
Answer all questions. Each question carries 14 marks.

5. a. Describe the performance terms used in measurement systems such as accuracy, precision, hysteresis error and linearity. Calibration of a voltmeter gave the following data. Determine the maximum hysteresis error as a percentage of the full-scale range. (CO1)

Increasing input	Standard mV	0	1	2	3	4
	Voltmeter mV	0	1	1.9	2.9	4
Decreasing input	Standard mV	4	3	2	1	0

P.T.O

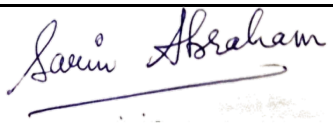
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b.	In a measurement system, the output of a sensor changes gradually when a step input is applied. Explain the sensor response and identify the dynamic characteristics involved with the help of a graph.	(CO1)
6.	a.	Why would you choose a resistive displacement sensor over an LVDT for a particular application? Explain with examples.	(CO2)
	b.	An automated industrial system requires measurement of rotational speed for monitoring and control applications. Explain the different types of speed sensors used for such systems with their working principles and applications.	(CO2)

Question No.	1	2	3	4	5a	5b	6a	6b	Total Marks
CO Mapping	CO1	CO1	CO2	CO2	CO1	CO1	CO2	CO2	
Bloom's Taxonomy Level	2	3	3	2	3	4	4	3	
Max. Mark	3	3	3	3	7	7	7	7	40

	Prepared By	Scrutinized By	Approved By
Name	Prof.Belma Joseph	Dr.Sarin Abraham	Dr.Aji Joy
Signature			
Date	05/08/2026	05/08/2026	05-08-2026

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