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

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

B. TECH SECOND SERIES EXAMINATION, OCTOBER 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. A computer-based measurement system needs to store sensor data directly in memory at high speed. Identify the suitable data-transfer technique. Explain. (CO3)

2. What is a smart sensor? Mention any two functions of a smart sensor. (CO3)

3. Which type of sensor is generally used to detect the angular position of a throttle shaft in a car engine? Why? (CO4)

4. A thermistor is connected to a DC supply in a temperature measurement circuit. Explain the purpose of the protective resistor used in the circuit. (CO4)

PART B

Answer all questions. Each question carries 14 marks.

5. a. A high-speed data acquisition system requires extremely fast analogue-to-digital conversion. Compare Flash, SAR, and Ramp ADCs and justify which architecture would be most appropriate for the application. (CO3)

   b. An ADC has a 10-bit resolution and a full-scale input voltage of 5 V. Calculate the number of available digital codes. (CO3)

6. a. Explain the various steps involved in designing a measurement system for a given application. (CO4)

   b. Develop an instrumentation system to measure the manifold absolute pressure in a car engine. Explain the sensor arrangement and signal processing. (CO4)

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