DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, NOVEMBER - 2023

SENSORS AND TRANSDUCERS

[Maximum Marks : 75]   [Time : 3 hours]

PART–A

I. Answer **all** the following questions in one word or sentence. Each question carries 1 mark.

(9x1=9 marks)

		Module Outcome	Cognitive level
1	Define activate transducer.	M1.01	R
2	List any two disadvantages of semiconductor strain gauge.	M1.02	R
3	Write any two applications of resistive transducers in which change in resistance is caused by change in resistivity.	M1.03	R
4	Write the equation for sensitivity of a capacitive transducer based on change in overlapping area.	M2.02	R
5	Write any two examples of synthetic piezoelectric material.	M2.03	R
6	What is photovoltaic cell?	M3.01	R
7	List any two advantages of ultrasonic transducer.	M3.02	R
8	Define smart transmitter.	M4.03	R
9	What is nano sensor?	M4.02	R

PART B

II. Answer **any Eight** questions from the following. Each question carries 3 marks.

(8x3=24)

		Module Outcome	Cognitive level
1	Draw the block diagram of a transducer and mark the blocks.	M1.01	U
2	Write short notes on the working semiconductor strain gauge using a neat diagram.	M1.02	U
3	List any three applications of thermistor, other than temperature measurement.	M1.03	R
4	Brief LVDT characteristics.	M2.02	U
5	List any three advantages of capacitive transducer.	M2.03	R
6	Write short notes on photo multiplier tube.	M3.01	U
7	Write the working principle of ultrasonic transducer using a neat diagram.	M3.02	U
8	Draw a hall effect current sensor and mark the parts.	M3.03	U
9	Write short notes on standard four wire electrical transmitter configuration with the help of neat diagram.	M4.01	U
10	List any three advantages of smart transmitters.	M4.02	R

PART C

Answer **all** questions from the following. Each question carries 7 marks.

(6x7=42marks)

		Module Outcome	Cognitive level
III	Explain how a potentiometer can be used for the measurement of linear displacement.	M1.02	A
	OR		
IV	Using a neat diagram explain the construction of LDR.	M1.02	U
V	Explain the operating principle of a thermistor and its application for temperature measurement.	M1.03	U
	OR		
VI	Explain the construction and working of unbounded metal wire strain gauge using a neat diagram.	M1.02	U
VII	Explain the application of LVDT for pressure measurement using neat diagram.	M2.02	U
	OR		
VIII	Illustrate an application of capacitive transducer based on change in dielectric constant.	M2.03	U
IX	Explain the principle of operation of mutual inductance-based transducers using a neat diagram.	M2.01	U
	OR		
X	Define piezoelectric effect. Explain the application of piezoelectric transducer for pressure measurement.	M2.03	U
XI	Using a neat diagram illustrate photo emissive transducers.	M3.01	U
	OR		
XII	Define Hall effect. Explain using a neat diagram the working principle of a hall effect transducer.	M3.03	U
XIII	Explain the block diagram of a smart sensor using a neat diagram.	M4.02	U
	OR		
XIV	Illustrate capacitive differential pressure transmitter using a neat diagram.	M4.03	U

****

2