TED (21) -3082
(Revision- 2021)

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE – NOVEMBER - 2022

SENSORS AND TRANSDUCERS

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

PART–A

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

(9x1=9 marks)

		Module Outcome	Cognitive level
1	Define the term transducer.	M 1.01	R
2	A resistance wire strain gauge is subjected to a stress of 100MN/m^2. The modulus of elasticity of steel is 200GN/m^2. Solve the applied strain.	M 1.03	A
3	A thermistor has a resistance temperature co-efficient of -5% over a temperature range of 25°C to 50°C. If the resistance of the thermistor is 100Ω at 25°C , what is the resistance at 35°C.	M1.03	A
4	Name one inductive transducer.	M2.01	R
5	Define piezo electric effect.	M2.04	R
6	Name one photo electric transducer.	M3.01	R
7	Write one application of Hall effect transducer.	M3.03	R
8	Name any one smart sensor.	M4.04	R
9	List one advantage of standard electrical transmission system.	M4.01	R

PART - B

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

(8x3=24marks)

		Module Outcome	Cognitive level
1	A linear resistance potentiometer is 50 mm long and is uniformly wound with a wire having a resistance of 10,000 Ω. Under normal conditions, the slider at the center of the potentiometer. Find the linear displacement when the resistance of the potentiometer as measured by a Wheatstone bridge for 3850 Ω.	M 1.01	A
2	Write any three applications of thermistors.	M 1.03	U
3	Compare analog and digital transducer with suitable examples.	M1.01	U
4	Illustrate the working principle of resistive transducer with equation	M1.02	U
5	The output of 2mV appears across the terminals of LVDT when the core moves through a distance of 0.5mm. Calculate the sensitivity of the LVDT.	M2.02	A

6	A pressure of 900kN/m^2 when applied to the top diaphragm produces a deflection of 0.6mm separated by a distance of 3.5mm. The capacitance is 370 pF when no pressure is applied to the diaphragms. Find the value of capacitance after the application of a pressure of 900 kN/m^2.	M2.03	A
7	Write three applications of Hall effect transducer.	M3.03	U
8	Label parts of the photo multiplier tube with neat diagram.	M3.01	R
9	Explain the concept of standard electrical (4-20mA) transmission system.	M4.01	U
10	Label the blocks of smart sensors with neat block diagram.	M4.02	R

PART - C

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

(6x7=42marks)

		Module Outcome	Cognitive level
III	Explain the working of linear type potentiometers.	M1.02	U
	OR		
IV	Explain the working of LDR with neat diagram.	M1.03	U
V	List different types of transducer with examples.	M1.01	R
	OR		
VI	Derive the equation for gauge factor.	M1.02	A
VII	List seven advantages of LVDT.	M2.02	R
	OR		
VIII	Illustrate pressure measurement using piezo electric transducer with diagram.	M2.04	U
IX	Illustrate the working of solar cell with neat diagram.	M3.01	U
	OR		
X	Summarize the working principle of photo diode with neat diagram.	M3.01	U
XI	Explain the application of Hall effect transducer for current measurement with neat diagram.	M3.03	U
	OR		
XII	Describe the level measurement using Ultrasonic transducer.	M3.02	U
XIII	Explain the block diagram of smart sensor.	M4.02	U
	OR		
XIV	Summaries the advantages of smart transmitter.	M4.02	U

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