Registration No.: | | | | | | | | | | |

Total Number of Pages: 02

Course: B.Tech
Sub_Code: ETPE3002

5th Semester Regular Examination: 2025-26
SUBJECT: Sensors and Transducers
BRANCH(S): AEIE, EEE
Time: 3 Hours
Max Marks: 100
Q.Code: U429

Answer Q1 (Part-I) which is compulsory, any eight from Part-II, and any two from Part-III.
The figures in the right-hand margin indicate marks.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

a) Define static sensitivity of a sensor.
b) What is repeatability?
c) What is the utility of elastic sensing element?
d) Define cold junction compensation.
e) Why variable reluctance sensor is so named?
f) What are proximity sensors?
g) What is FET-based chemical sensor?
h) Define MEMS.
i) What is ion-selective electrode?
j) Write down the significance of signal-to-noise ratio.

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) Explain statistical characteristics of measurement systems with examples.
b) Draw and discuss the step response of a first-order system.
c) Describe the calibration process of a measurement system.
d) Discuss installation problems in thermocouples.
e) Discuss thermocouple characteristics.
f) Explain Rota meter Float System with a neat diagram.
g) Discuss RTD construction and working.
h) Describe capacitive sensors for measuring displacement and pressure.
i) Explain LVDT with a neat diagram and its applications.
j) Discuss Electrochemical gas sensors with examples.
k) Explain working of Hall Effect Sensor.
l) Discuss IC temperature sensors.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3	**a)**	Explain different types of errors in measurement systems.	**(8)**
	b)	Explain dynamic characteristics of sensors and compare first-order and second-order systems with examples.	**(8)**
Q4	**a)**	Explain working of a Bourdon tube with diagram.	**(8)**
	b)	Explain signal and noise problems with noise reduction techniques.	**(8)**
Q5	**a)**	Describe strain gauges and explain different types of bridge circuits.	**(8)**
	b)	Discuss optical encoders and their types.	**(8)**
Q6	**a)**	Explain Piezoelectric & Piezoresistive sensors with construction, working, and applications.	**(8)**
	b)	Discuss smart sensors, digital sensors, interfacing fundamentals, and their industrial applications.	**(8)**