Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI EXAMINATION – SUMMER 2025

Subject Code:3161008 Date:28-05-2025

Subject Name:Sensors and Transducers

Time:10:30 AM TO 01:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	How the performance of any sensor is measured?	**03**
	(b)	Define following: 1 .Settling time 2.Fidelity 3. Hysteresis 4.Linerarity	**04**
	(c)	List down different types calibration techniques for sensors. Explain any one of them.	**07**
Q.2	**(a)**	Write advantages and disadvantages of Thermocouple.	**03**
	(b)	What is thermistor and how it works?	**04**
	(c)	Explain the principle of operations of RVDT with the help of neat sketch and characteristics.	**07**
		OR	
	(c)	Potentiometer can be used as motion sensor – Justify the statement.	**07**
Q.3	**(a)**	List out applications of the RF beacons.	**03**
	(b)	Define Hall effect and justify the applications of it.	**04**
	(c)	What are the different types of magnetic sensors? On what principles do they work? Outline briefly.	**07**
		OR	
Q.3	**(a)**	State the basic concept of an electrical resistance strain gauge.	**03**
	(b)	Write down the advantages of magnetic sensors.	**04**
	(c)	Show the constructional and functional details of photo conductive cell with the relevant laws and diagrams.	**07**
Q.4	**(a)**	Explain the principle of ultrasonic Flow meter.	**03**
	(b)	List the properties of piezoelectric crystals.	**04**
	(c)	What is gyroscope? Explain the principle of operation and properties of it with relevant diagrams.	**07**
		OR	
Q.4	**(a)**	What is meant by signal conditioning and why it is required?	**03**
	(b)	List down the applications of attenuators, amplifiers and passive filters in signal conditioning.	**04**
	(c)	Elaborate an Instrumentation amplifier with neat diagram and estimate its gain.	**07**
Q.5	**(a)**	Compare MEMS sensors and Nano Sensors.	**03**
	(b)	Explain the working principle of LASER sensor.	**04**
	(c)	Draw and explain sample and hold circuit	**07**
		OR	
Q.5	**(a)**	List down the features and applications of inclinometers.	**03**
	(b)	Describe the operation of Weighted Resistor DAC.	**04**
	(c)	Explain any one type of ADC with neat diagram.	**07**