Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VI (NEW) EXAMINATION – WINTER 2024

Subject Code:3161008 Date:02-12-2024

Subject Name: Sensors and Transducers

Time:02:30 PM TO 05:00 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)**	Define following: 1.Threshold 2.Drift 3.Fidelity	**03**
	(b)	List down sensor classification.	**04**
	(c)	What are the different techniques to calibrate sensors? Explain any one of them in	**07**
Q.2	**(a)**	Describe working of Radiation temperature sensor.	**03**
	(b)	Explain thermoelectric effects for thermocouple.	**04**
	(c)	What is thermistor? How does it sense temperature? Explain its one of application.	**07**
		OR	
	(c)	Explain the operation and application of Laser range Sensor (LIDAR).	**07**
Q.3	**(a)**	What are the advantages and disadvantages of LVDT?	**03**
	(b)	Define motion sensor. List the various types of motion sensors. List the motion sensors application.	**04**
	(c)	Describe the construction and working of magnetic sensors.	**07**
		OR	
Q.3	**(a)**	What is gauge factor? What are the different types of strain gauge?	**03**
	(b)	Define load cell. List out the various kinds of load cells. Enumerate use of load cell.	**04**
	(c)	Define Hall Effect. Draw and explain the Hall Effect sensor.	**07**
Q.4	**(a)**	What is piezo electric effect? What are the classifications of piezoelectric transducers?	**03**
	(b)	What is fiber optic sensor Draw and explain the block diagram of fiber optic sensor.	**04**
	(c)	Explain the basic principle of gyroscope and its types.	**07**
		OR	
Q.4	**(a)**	Define encoder. List out types of encoder.	**03**
	(b)	What is the principle of capacitive transducer? What are the desirable features of capacitive transducer?	**04**
	(c)	Explain the construction and working of photo voltaic with near sketch.	**07**
Q.5	**(a)**	What is meant by signal conditioning and why it is required?	**03**
	(b)	List out the objectives of data acquisition system.	**04**
	(c)	Describe operation of sample and hold circuits with relevant waveform.	**07**
		OR	
Q.5	**(a)**	List down applications of Attenuators.	**03**
	(b)	Contrast the types of amplifiers that can be used with sensors. Assess the need of amplifiers in sensing applications.	**04**
	(c)	Explain the construction and working of single channel and multi-channel data acquisition system.	**07**

****