

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023

Subject Code: 3170208

Date: 14-12-2023

Subject Name: Measurement, Instrumentation and Control in Automobile

Time: 10:30 AM TO 01:00 PM

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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.

		MARKS
Q.1	(a) Explain the need of Measurement.	03
	(b) List the common sources of errors in instruments and explain (i) Gross errors (ii) Systematic errors.	04
	(c) Draw a block diagram of Generalized Measurement System and explain the various elements of it in details.	07
Q.2	(a) Define the following term: (1) Linearity (2) Threshold (3) Drift	03
	(b) Explain Oxygen sensor in detail.	04
	(c) Name the instruments used for force and torque measurement and explain Rope brake dynamometer with neat sketch.	07
OR		
	(c) Write short note on Exhaust gas recirculation actuator.	07
Q.3	(a) Explain pneumatic solenoid valve.	03
	(b) Explain any one method for Velocity Measurement.	04
	(c) Describe the working of Bourdon tube pressure gauge with neat sketch.	07
OR		
Q.3	(a) Differentiate between Hydraulic load cell and Pneumatic load cell.	03
	(b) Explain Piezoelectric and variable capacitive type accelerometers.	04
	(c) Write short note on stroboscopes.	07
Q.4	(a) Explain Electromechanical transducers.	03
	(b) Differentiate between Sensor and Transducer.	04
	(c) Explain primary, Secondary and Tertiary types of measurements with suitable examples.	07
OR		
Q.4	(a) What is Function of Actuator? State its application in Automobile.	03
	(b) Explain fluid flow measurement system.	04
	(c) Discuss traction control and electronic stability for automobile system.	07
Q.5	(a) Explain Adaptive power steering.	03
	(b) Explain vehicle data acquisition system.	04
	(c) Describe Antilock braking system (ABS).	07
OR		
Q.5	(a) Explain active suspension control system in short.	03
	(b) Explain safety and Comfort Systems of Automobile.	04
	(c) Write short note on adaptive cruise control system in details.	07
