Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE – SEMESTER- VII EXAMINATION-SUMMER 2023**

**Subject Code: 3170208 Date: 16/06/2023**

**Subject Name: Measurement, Instrumentation and Control in Automobile**

**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.**

| | | | **MARKS** |
|---|---|---|---|
| **Q.1** | **(a)** | Define: (1) Threshold, (2) Hysteresis (3) Sensitivity | **03** |
| | **(b)** | Describe static and dynamic measurement system. | **04** |
| | **(c)** | List out mechanical measurements used in automobile and explain in brief about any one of them. | **07** |
| **Q.2** | **(a)** | Write definition of Readability and Reproducibility. | **03** |
| | **(b)** | Discuss about data acquisition systems for automobile engineering. | **04** |
| | **(c)** | Explain with neat sketch Exhaust gas recirculation actuators. | **07** |
| | | **OR** | |
| | **(c)** | Write different types variable resistance type sensors and explain any one in detail. | **07** |
| **Q.3** | **(a)** | Compare any two different temperature measurement instruments for suitability to measure coolant temperature. | **03** |
| | **(b)** | Define error in mechanical measurement and classify the errors. | **04** |
| | **(c)** | Discuss traction control and electronic stability for automobile system. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | What is thermocouple? Write the advantages of it. | **03** |
| | **(b)** | Explain pressure sensors in detail. | **04** |
| | **(c)** | Explain Working of Rope Brake Dynamometer for torque measurement. | **07** |
| **Q.4** | **(a)** | Compare Power Absorption Dynamometers with Power Transmission Dynamometers. | **03** |
| | **(b)** | Explain (i) Piezo-eletric type and (ii) Seismic type accelerometers. | **04** |
| | **(c)** | Draw a neat diagram of adaptive power Steering system and explain it’s working in detail. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Explain (i) Analogue Signals (ii) Pulsed Signals | **03** |
| | **(b)** | Explain any one method for Vibration Measurement. | **04** |

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|---|---|---|---|
| | **(c)** | Give the types of valve used to provide a computer controlled idle air supply and explain any one with neat diagram. | **07** |
| **Q.5** | **(a)** | What is Load cell? Compare Hydraulic load cell with Pneumatic load cell. | **03** |
| | **(b)** | Explain stroboscopes. | **04** |
| | **(c)** | Describe instrumentation required for testing of IC Engine. | **07** |

**OR**

| | | | |
|---|---|---|---|
| **Q.5** | **(a)** | Explain FFT analyzer. | **03** |
| | **(b)** | Explain Working of Oxygen Sensor in Automobile. | **04** |
| | **(c)** | Explain electronic transmission control system with neat diagram. | **07** |

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