

GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2024

Subject Code:3170208

Date:07-12-2024

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.

- Q.1** (a) Differentiate between Static and Dynamic measurement systems. **03**
(b) Define error in mechanical measurement and classify the errors. **04**
(c) Explain in detail with the help of a block diagram the generalized measurement system **07**
- Q.2** (a) Define the following terms. i.) Hysteresis ii) Drift and iii) Range **03**
(b) Differentiate between terms “Accuracy” and “precision” with suitable examples **04**
(c) Explain working of rope brake dynamometer for power measurement **07**
- OR**
- (c) Describe with the help of a neat sketch the working of diaphragm pressure gauge. **07**
- Q.3** (a) Explain the working of piezoelectric accelerometer.. **03**
(b) Define a load cell and Explain the hydraulic load cell. **04**
(c) Explain with neat diagram the construction and working of a Cathode Ray Oscilloscope.(CRO) **07**
- OR**
- Q.3** (a) Enlist the advantages and disadvantages of thermocouples. **03**
(b) Explain the working principle of a stroboscope. **04**
(c) Describe in detail the Data Acquisition System (DAS) used in Automobiles. **07**
- Q.4** (a) Enlist advance safety features used in automobiles. **03**
(b) Explain with neat sketch solenoid operated valve. **04**
(c) Explain with neat sketch the working of hot wire type air flow (MAF) rate sensor. **07**
- OR**
- Q.4** (a) Explain in brief the engine coolant temperature sensor **03**
(b) Explain Working of Pressure Sensor used in an Automobiles **04**
(c) Explain with diagram exhaust gas recirculation actuator. **07**
- Q.5** (a) Differentiate between sensors and actuators with suitable examples. **03**
(b) Describe briefly the adaptive power system used in automobiles. **04**
(c) Explain with neat sketch Anti-locking braking System (ABS) of an Automobile **07**
- OR**
- Q.5** (a) Differentiate between Analog and Digital transducers **03**
(b) Describe briefly the active suspension control system used in automobiles. **04**
(c) Explain with neat diagram electronic transmission control system. **07**
