

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2022****Subject Code:3170208****Date:05-01-2023****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

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| Q.1 | (a) Differentiate between Static and Dynamic measurement systems. | 03 |
| | (b) Define error in mechanical measurement and classify the errors. | 04 |
| | (c) List out the requirements of measurements and explain each in brief. | 07 |
| Q.2 | (a) Enlist the principal elements of magnetic reluctance type sensor and also give the various applications of it in automobile. | 03 |
| | (b) Define sensor. List out the types of sensors used in automobile. | 04 |
| | (c) Explain the working of vane type air flow (MAF) rate sensor with neat diagram. | 07 |
| OR | | |
| | (c) Explain the working of hot wire type air flow (MAF) rate Sensor with neat diagram. | 07 |
| Q.3 | (a) What is thermocouple? Write the advantages of it. | 03 |
| | (b) Write a short note on data acquisition method in automobile. | 04 |
| | (c) Describe the working of diaphragm pressure gauge with neat sketch. | 07 |
| OR | | |
| Q.3 | (a) What is Load cell? Compare Hydraulic load cell with Pneumatic load cell.. | 03 |
| | (b) Explain (i)Piezo-eletric type and (ii) Seismic type accelerometers. | 04 |
| | (c) Explain method of rotational speed measurement by using stroboscope with neat sketch. | 07 |
| Q.4 | (a) Compare Power Absorption Dynamometers with Power Transmission Dynamometers. | 03 |
| | (b) What is Transducer? Explain the different types of transducers. | 04 |
| | (c) Give the types of valve used to provide a computer controlled idle air supply and explain any one with neat diagram. | 07 |
| OR | | |
| Q.4 | (a) Explain (i) Analogue Signals (ii) Pulsed Signals | 03 |
| | (b) Describe the diaphragm pressure gauge. | 04 |
| | (c) Explain the working of exhaust gas recirculation (EGR) with neat sketch. | 07 |
| Q.5 | (a) List out the safety and comfort systems used in modern vehicles with its description. | 03 |
| | (b) Describe active suspension control system in short. | 04 |
| | (c) Explain electronic transmission control system with neat diagram. | 07 |

OR

- Q.5** (a) What is the importance of power train and motion control systems in a vehicle? **03**
- (b) Explain adaptive cruise control system with its advantages. **04**
- (c) Draw a neat diagram of adaptive power Steering system and explain it's working in detail. **07**
