

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**M.Tech., Winter 2017 - 18 Examination**

**Semester: 2**  
**Subject Code: 03206153**  
**Subject Name: Experimental Techniques and Instrumentations**  
**in Automobile Engineering**

**Date: 10/01/2018**  
**Time: 02:00 pm to 04:30 pm**  
**Total Marks: 60**

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**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1 A)** Compare direct type pressure monitoring system (D-TPMS) with indirect type pressure monitoring system (I-TPMS). (05)

**B)** What are sensors and actuators? Give the criteria to choose a sensor and also give classification of sensors. Enlist some type of actuators. (05)

**C)** With the help of neat diagram, explain the working of a coolant temperature sensor. (05)

**Q.2 Answer the following questions.** (Attempt any three) (Each five mark) (15)

**A)** Discuss the working of a piezoelectric accelerometer or L.V.D.T accelerometer.

**B)** What is the importance of using cathode Ray oscilloscope in automobile designing. Explain in brief the working of a simple C.R.O.

**C)** Explain the principle of working of a stroboscope. give its advantages and disadvantage.

**D)** A certain thermometer has a time constant of 15 s. The initial temperature is 20 °C. It is suddenly exposed to a temperature of 100 °C. Determine the time rise i.e. the time to attain 90% of steady state value and the temperature at this time.

**Q.3 A)** With the help of a block diagram, explain the stages of a generalized measurement system. Hence give a detailed block diagram of a multi channel data acquisition system. (07)

**B)** Explain what is controller area network system (CAN bus) and discuss its application to automobiles. (08)

**OR**

**B)** Describe the working of thermostatic type fuel gauge or water temperature gauge. (08)

**Q.4 A)** In the domain analysis, explain clearly:

**I.** Step Input

**II.** Ramp Input (07)

**III.** Parabolic Input

**IV.** Impulse Input

**OR**

**A)** What is the purpose of choke in automobiles. With a neat sketch describe the working of a choke out warning arrangement. (07)

**B)** Explain clearly the terms (any three)

**I.** Threshold and resolution

**II.** Hysteresis (08)

**III.** Drift

**IV.** Sensitivity