

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER- VIII (New) EXAMINATION – WINTER 2019****Subject Code: 2182604****Date: 29/11/2019****Subject Name: Automation & control in Rubber Industries****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

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|-----------|--|----|
| Q.1 (a)   | List out static characteristics of instrument. Define any two.   | 03 |
| Q.1 (b)   | Give any four symbols used in instrumentation diagram.   | 04 |
| Q.1 (c)   | Explain the fundamental elements of an instrument.   | 07 |
| Q.2 (a)   | Which general considerations are made for quality control in rubber industry?  | 03 |
| Q.2 (b)   | Write a short note on material specification.  | 04 |
| Q.2 (c)   | Discuss the problems with microcomputer in data acquisition and analysis.  | 07 |
| <b>OR</b> |  |    |
| Q.2 (c)   | Which methods are available to design the rubber processing trials? Explain any one in detail.   | 07 |
| Q.3 (a)   | Draw different configurations of thermistors.  | 03 |
| Q.3 (b)   | List out the different elastic pressure transducer. Write on any one.  | 04 |
| Q.3 (c)   | Discuss in detail about forced induced variation in calendered gauge.  | 07 |
| <b>OR</b> |  |    |
| Q.3 (a)   | Write major components of electrical pressure transducer.  | 03 |
| Q.3 (b)   | Give the name of the device which is used to measure the temperature of rubber compound. Also write on that.   | 04 |
| Q.3 (c)   | Discuss in detail about mechanically induced variation in calendered gauge.  | 07 |
| Q.4 (a)   | Explain the step forcing function.   | 03 |
| Q.4 (b)   | How the screw speed measurement is carried out during extrusion process?   | 04 |
| Q.4 (c)   | Discuss the dynamic behavior of first order control system by taking suitable example.   | 07 |
| <b>OR</b> |  |    |
| Q.4 (a)   | Explain the impulse forcing function.  | 03 |
| Q.4 (b)   | Write a short note on different pressure transducers used to measure die head pressure during extrusion process.                                       | 04 |
| Q.4 (c)   | Explain the servo mechanism control problem for positive feedback system and negative feedback system respectively by following block diagram algebra. | 07 |
| Q.5 (a)   | Give the importance of the LAN in rubber industries.   | 03 |
| Q.5 (b)   | Write a note on comparator. Which terms are used in controlled configurations?   | 04 |
| Q.5 (c)   | Compare hydraulic controller and pneumatic controller.   | 07 |
| <b>OR</b> |  |    |
| Q.5 (a)   | List the hardware steps necessary to bring information from rubber testing equipment sensor to microcomputer.  | 03 |
| Q.5 (b)   | Derive the transfer function for P-Controller and PD-Controller respectively.  | 04 |
| Q.5 (c)   | Discuss the dynamic behavior of pneumatic control valve.   | 07 |

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