Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VIII • EXAMINATION – SUMMER 2015

Subject code: 182604 **Date:11/05/2015**

Subject Name: Automation and Control In Rubber Industries

Time: 10.30am-01.00pm **Total Marks: 70**

Instructions:

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

Q.1	**(a)**	Describe the static characteristics of an instrument.	**06**
Q.1	**(b)**	Answer the following	
	i	Explain elements of instruments with suitable example.	**05**
	ii	Which characteristic information would be indicated by instrumentation diagram?	**03**
Q.2	**(a)**	Which methods are available to design the rubber processing trials? Explain any one in detail.	**07**
Q.2	**(b)**	Answer the following	
	i	Write a short note on specifications of machine settings.	**04**
	ii	Mention the circumstances in which off-line inspection is carried out.	**03**
		OR	
Q.2	**(b)**	Answer the following	
	i	Which general considerations are made in process capability studies?	**04**
	ii	Write a brief note on sampling inspection.	**03**
Q.3	**(a)**	Discuss in detail about forced induced variation in calendered gauge.	**07**
Q.3	**(b)**	Answer the following	
	i	Write a short note on thermistors.	**04**
	ii	List the examples of elastic pressure transducers.	**03**
		OR	
Q.3	**(a)**	Discuss in detail about mechanically induced variation in calendered gauge.	**07**
Q.3	**(b)**	Answer the following	
	i	How temperature measurement of rubber compound is carried out by pyrometer?	**04**
	ii	Which are the major components of electrical pressure transducer?	**03**
Q.4	**(a)**	Answer the following	
	i	Explain the force measurement by hydraulic force meter.	**04**
	ii	Which features are included as a part of injection moulding machine control?	**03**
Q.4	**(b)**	Discuss the dynamic behavior of first order control system with suitable example and necessary assumptions.	**07**
		OR	

Q.4	**(a)**	Answer the following	
	i	Explain the force measurement by pneumatic force meter.	**04**
	ii	Which methods are available to control the mixing process?	**03**
Q.4	**(b)**	Explain the step forcing function. Derive the step response equation of first order control system with its typical features.	**07**
Q.5	**(a)**	Answer the following	
	i	Derive the transfer function for Proportional Integral(PI) Controller	**03**
	ii	Explain the servo problem with suitable example.	**04**
Q.5	**(b)**	Discuss the problems with microcomputers in data acquisition and analysis.	**07**

OR

Q.5	**(a)**	Answer the following	
	i	Derive the transfer function for Proportional Derivative (PD) Controller.	**03**
	ii	Explain the regulatory problem with suitable example.	**04**
Q.5	**(b)**	Give the classification of interfaces used in rubber testing equipment. Write a short note on turn-key software which is used for data acquisition in rubber factory.	**07**

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