Seat No.:	Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. - SEMESTER - VI • EXAMINATION - WINTER 2012

Subject code: 162604		code: 162604 Date: 02/01/2013	
Su	bject	Name: Characterization of Rubber	
Tir	ne: 0	2.30 pm - 05.00 pm Total Marks: 70	
Ins	struc	tions:	
	2.	Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.	
Q.1	(a)	Define the following terms: (i) Heating Rate (ii) Plateau (iii) Base line (iv) Peak (v)Peak Width (vi) Peak Height (vii)Peak Area	07
Q.1	(b) (i)	Answer the following Give the full form of following terms: (i) ASTM (ii)ANSI (iii) DIN (iv)BSI (v) CEN	05
	(ii)	Write down the meaning of following terms: (i)SCI WG 2 (ii) SCI WG 3	02
Q.2	(a)	Discuss the applications of the various microscopic techniques in characterization of rubber and related materials.	07
Q.2	(b)	Answer the following	
	(i)	Write a short note on Small Angle X-ray Scattering.	04
	(ii)	Give the different circumstances in which standard test method is used. OR	03
Q.2	(b)	Answer the following	
	(i)	Write a short note on Wide Angle X-ray Scattering.	04
	(ii)	List out the standard testing conditions.	03
Q.3	(a)	Discuss the scan of Dynamic Mechanical Analysis showing the types of transitions seen during the analysis by taking suitable example of rubber.	07
Q.3	(b)	Answer the following	
	(i) (ii)	Write down the applications of Differential Thermal Analysis apparatus. Which different types of sample holders are used in Thermogravimetric Analyzer?	04 03
0.3	()	OR	0.6
Q.3	(a)	Explain the construction and working of thermobalance.	06
Q.3	(b)	Answer the following	
	(i)	Give the difference between Differential Thermal Analysis and Differential	04
	(0.0)	Scanning Calorimetry.	
	(ii)	What are the requirements of good Differential Scanning Calorimetry apparatus?	04
Q.4	(a)	Discuss the classification of Gas Chromatography.	06
Q.4	(b) (i)	Answer the following Write a short note on Gel Permeation Chromatography.	05

	(ii)	What do you mean by partition ratio? List the factors affecting the partition ratio.	03
		OR	
Q.4	(a)	Write a short note on Thin Layer Chromatography.	06
Q.4	(b) (i) (ii)	Answer the following Explain the term chromatography. Also write on partition chromatography. What do you mean by career gas? Is oxygen suitable as career gas? Why?	05 03
Q.5	(a)	Discuss the various types of transitions take place during ultraviolet spectrometry.	07
Q.5	(b)	Answer the following	
•	(i)	Write down the procedure to determine the chloroform extract of rubber vulcanizate.	04
	(ii)	List the major components of nuclear magnetic resonance spectrometer.	03
		OR	
Q.5	(a)	Explain the field application of infrared spectroscopy for the pyrolyzates and films of Isoprene Rubber, Polychoroprene Rubber and Nitrile Rubber.	07
Q.5	(b)	Answer the following	
	(i)	Write down the scope of acetone extract method. Which apparatus are used to	04
		determine the acetone extract? How can we express its output?	
	(ii)	How single beam spectrophotometer differs from double beam spectrophotometer?	03
