Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E –IIst SEMESTER–EXAMINATION – JULY- 2012

Subject code: 1724007 **Date: 14/07/2012**

Subject Name: Weathering of Rubber

Time: 10:30 am – 13:00 pm **Total Marks: 70**

Instructions:

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

Q. 1	**(a)**	Discuss in detail about the ozone degradation of rubber.	**07**
Q. 1	**(b)**	Answer the following	
	i.	Explain the fundamental hurdles to access the service life of the rubber products.	**03**
	ii.	Explain the factors affecting the thermal stability of C-C bond.	**04**
Q. 2	**(a)**	Explain the mechanical degradation of the rubber with suitable examples.	**07**
Q. 2	**(b)**	Answer the following	
	i.	Explain the effect of specimen thickness on the rate of oxygen diffusion.	**04**
	ii.	Which particular considerations are made in durability test?	**03**
		OR	
Q. 2	**(b)**	Answer the following	
	i.	How is set measurement carried out?	**04**
	ii.	Stress relaxation measurements can be used as general guide to ageing-justify this statement.	**03**
Q. 3	**(a)**	Discuss the factors which influence the choice of the test parameters.	**07**
Q. 3	**(b)**	Answer the following	
	i.	Summarize the important considerations in natural weathering test.	**05**
	ii.	Write down the example of natural environmental ageing.	**02**
		OR	
Q. 3	**(a)**	Explain the different available methods of accelerated testing.	**06**
Q. 3	**(b)**	Answer the following	
	i.	Explain the principle reactions which are important in photo degradation of rubber.	**04**
	ii.	Explain the degradation of rubber by fluids.	**04**
Q. 4	**(a)**	Discuss in detail about the steps identified in designing an accelerated test programme.	**07**
Q. 4	**(b)**	Write down the distinct purposes of heat ageing test. How these tests are conducted?	**07**
		OR	
Q. 4	**(a)**	Discuss in detail about the tests in which prime aim is to induce and/or to propagate the cracks without significant heating.	**07**
	(b)	Answer the following	
	i.	What do you mean by wear? Explain the various mechanisms of wear.	**04**
	ii.	What do you mean by abradants? List the various types of abradants.	**03**
Q. 5	**(a)**	Which degradation model is developed to find out the effect of temperature as degradation agent? Discuss that model in detail.	**07**
Q. 5	**(b)**	Answer the following	
	i.	Write about the different possible geometries by which the test specimen and abradant can be rubbed together?	**04**
	ii.	Quote the general relation for the change of property with time.	**03**
		OR	
Q. 5	**(a)**	Discuss the model for artificial weathering.	**07**
Q. 5	**(b)**	Answer the following	
	i.	Explain the general modes of oxidation inhibition of rubber.	**05**
	ii.	List the stages to model the degradation process.	**02**

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