Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2014

Subject code: 1724007 **Date: 25-06-2014**

Subject Name: Weathering of Rubber

Time: 02:30 pm - 05:00 pm **Total Marks: 70**

Instructions:

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

Q. 1	**(a)**	Discuss in detail about the ultraviolet degradation of rubber with necessary reaction mechanism.	**07**
Q. 1 B	**i**	Explain the basic types of degradation.	**04**
	ii	Write down the function of photostabilizer. Also give the examples of photostabilizer.	**03**
Q. 2	**(a)**	Discuss the factors which influence the choice of test parameters.	**07**
Q. 2B	**i**	Explain the different methods used to prepare the test specimen.	**04**
	ii	Differentiate the oxygen degradation and ozone degradation.	**03**
		OR	
Q.2 B	**i**	Summarize the important considerations in natural weathering test.	**05**
	ii	What do you mean by service life of the rubber product? How is it assessed?	**02**
Q. 3	**(a)**	Write down the principle of hardness test. List the different methods available for hardness measurement. Explain any one method.	**07**
Q. 3B	**i**	How an elongation measurement is carried out in tensile test?	**04**
	ii	Write a brief note on storage modulus.	**03**
		OR	
Q. 3	**(a)**	Discuss in detail about the tear test.	**07**
Q. 3B	**i**	Explain an effect of specimen thickness on the rate of oxygen diffusion.	**04**
	ii	Write a brief note on loss modulus.	**03**
Q. 4	**(a)**	Discuss in detail about the heat build up test.	**07**
Q. 4B	**i**	Which are the different possible geometries by which the test specimen and abradant can be rubbed together?	**05**
	ii	Write down the result of compression set measurement under constant load method.	**02**
		OR	
Q. 4	**(a)**	Discuss in detail about the test in which prime aim is to propagate the crack.	**07**
Q. 4B	**i**	Write a short note on different types of abradants. Also list the factors affecting the rate of abrasion.	**05**
	ii	Write down the result of compression set measurement under constant deflection method.	**02**
Q. 5	**(a)**	Describe the construction and working of ozone exposure apparatus.	**06**
Q. 5B	**i**	Explain the model for swelling resistance.	**05**
	ii	Quote the general relation for the change of property with time.	**03**
		OR	
Q. 5	**(a)**	Write down the procedure to carry out the accelerated ageing of rubber product in air.	**06**
Q. 5B	**i**	Explain the model for stress relaxation and creep.	**05**
	ii	What are the objectives behind the accelerated testing?	**03**

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