Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEM-VI Regular Examination May 2011

Subject code: 162601

Subject Name: Rubber Compound and Product Testing

Date: 16/05/2011 **Time: 10.30 am – 01.00 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)**	Answer the following	
	(i)	Why is it necessary to carry out the testing at different conditions?	**02**
	(ii)	Explain the various standard methods for dimension measurement.	**06**
	(b)	Answer the following	
	(i)	Which points are to be kept in mind during the hardness measurement?	**03**
	(ii)	Which are the different ways to apply indenting force on the vulcanizate? Which one is better? Why?	**03**
Q. 2	**(a)**	Answer the following	
	(i)	How is the estimation of green strength carried out?	**03**
	(ii)	Write down the scope and practical significance of stress relaxation test under compression.	**04**
	(b)	Discuss in detail about the constant volume method to measure the permeability of rubber product.	**07**
		OR	
	(b)	Discuss the method used to evaluate the permeability of rubber with respect to volatile liquids diffusing into air.	**07**
Q. 3	**(a)**	Answer the following	
	(i)	Write about the different types of test specimens used to determine the tensile strength with their merits and demerits.	**04**
	(ii)	Explain the different modes to apply constant load for compression set.	**06**
	(b)	Explain the term tracking. How is tracking resistance measured for rubber product?	**04**
		OR	
Q. 3	**(a)**	Answer the following	
	(i)	Write about the various types of grips used to hold test specimen in tensile testing machine.	**04**
	(ii)	Out line the recovery test which is developed to measure the low temperature behavior of rubber.	**06**

	(b)	Define the following terms: (i) Antistatic Rubber (ii) Conductive Rubber (iii) Permittivity (iv) Power factor	**04**
Q. 4	**(a)**	Answer the following	
	(i)	Which methods are used to determine abrasion resistance? Discuss any one.	**06**
	(ii)	Write down the procedure to measure the cut-growth resistance of rubber.	**04**
	(b)	Write about the test specimen and test conditions used to measure the rebound resilience. How the result of the test is expressed?	**04**
		OR	
Q. 4	**(a)**	Answer the following	
	(i)	Discuss the factors affecting the rate of wear.	**04**
	(ii)	Give the name of the apparatus used to measure the cut-growth resistance. Also write down the major components of the apparatus.	**04**
	(b)	List the various types of pendulum used to measure the resilience. Explain any two.	**06**
Q. 5	**(a)**	Answer the following	
	(i)	Write down the working principle of accelerated ageing by heating in air. Also give the recommendations for normal oven to avoid the migration of compounding ingredients.	**05**
	(ii)	Explain the E-grade crakes.	**02**
	(b)	Explain the test method to measure the swelling resistance of rubber when whole test specimen is exposed to liquid.	**07**
		OR	
Q. 5	**(a)**	Answer the following	
	(i)	Draw schematic diagram of ozone exposure apparatus. Write down the standard conditions under which the test is conducted?	**04**
	(ii)	Write in brief about the classification of fatigue test.	**03**
	(b)	Explain the test method to measure the swelling resistance of rubber when only one surface of test specimen is exposed to the liquid.	**07**

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