Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III • EXAMINATION – SUMMER 2013

Subject Code: 132601 **Date: 31-05-2013**

Subject Name: Basic Rubber Science

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 marks.**

Q.1	**(a)**	Differentiate the lyophilic sols and lyophobic sols.	**07**
Q.1	**(b)**	Answer the following	
	i	Give the classification of rubbers with respect to their main chain backbone and structure respectively.	**05**
	ii	What do you mean by degree of polymerization?	**02**
Q.2	**(a)**	Discuss the conditions which are necessary for rubber like elasticity in polymers.	**07**
Q.2	**(b)**	Explain the term surface tension. Derive the formula to calculate the surface tension by capillary method.	**07**
		OR	
Q.2	**(b)**	Answer the following	
	i	Why nitrile rubber shows superior oil resistance among all dienes?	**04**
	ii	Which different types of motions are observed in rubber?	**03**
Q.3	**(a)**	State the experimental laws of friction. Give the modification to these laws for applications to rubber.	**06**
Q.3	**(b)**	Answer the following	
	i	Write a brief note on bulk modulus and elastic collision respectively.	**04**
	ii	Define the following terms: (i) Vibrations (ii) Waves (iii) Diffusion (iv) Conduction	**04**
		OR	
Q.3	**(a)**	Describe the phenomenon of vibration isolation by taking an example of rubber mountings.	**06**
Q.3	**(b)**	Answer the following	
	i	Explain the phenomenon of total internal reflection, constructive and destructive interference and polarization. Find the velocity of light in glass if the refractive index of glass is 1.5	**05**
	ii	State the principle laws of floatation.	**03**
Q.4	**(a)**	Discuss the salient features of bulk polymerization.	**07**
Q.4	**(b)**	Answer the following	
	i	Write a short note on initiators.	**05**
	ii	Define the following terms: (i)Polymer (ii) Polymerization	**02**
		OR	

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Q.4	**(a)**	Discuss the salient features of suspension polymerization.	**07**
Q.4	**(b)**	Answer the following	
	i	Write a short note on inhibitors.	**04**
	ii	Explain the concept of functionality with suitable examples.	**03**
Q.5	**(a)**	List the different methods available to prepare colloidal solution. Discuss any two in detail.	**07**
Q.5	**(b)**	Answer the following	
	i	Write a short note on types of solutions.	**05**
	ii	Define the following terms: (i) Crystalloids (ii) Colloids	**02**

OR

Q.5	**(a)**	List the different purification methods available for colloidal solutions. Discuss any two in detail.	**07**
Q.5	**(b)**	Answer the following	
	i	Explain the characteristics of colloidal state.	**04**
	ii	What do you mean by multimolecular colloids? Also give their examples.	**03**

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