Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III(New) • EXAMINATION – WINTER 2016

Subject Code:2132601 **Date:04/01/2017**

Subject Name:Basic Rubber Science

Time:10:30 AM to 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.**

			MARKS
Q.1		**Answer the following**	**14**
	1.	Draw Structure of Q-class rubber.	
	2.	Write down the formula to calculate the shear modulus with respect to rubber.	
	3.	List out the any two types of friction.	
	4.	Give the name of apparatus which is used to determine the surface tension.	
	5.	What do you mean by electromagnetic spectrum?	
	6.	Define the term 'waves'.	
	7.	Classify polymer based on its thermal behavior.	
	8.	Give two examples of rubber which come under category of dienes.	
	9.	Give any two examples of initiator.	
	10.	What do you mean by 'gel'?	
	11.	Write down the full form of CMC.	
	12.	What do you mean by convective heat transfer?	
	13.	Give the unit of thermal diffusivity.	
	14.	What do you mean by diffusion?	
Q.2	**(a)**	With suitable example, explain the concept of functionality.	**03**
Q.2	**(b)**	Explain the termination stage associated with free-radical polymerization.	**04**
Q.2	**(c)**	Discuss mechanism of emulsion polymerization technique.	**07**
		OR	
Q.2	**(c)**	Discuss the salient features of solution polymerization technique.	**07**
Q.3	**(a)**	Write in brief on 'bulk modulus'	**03**
Q.3	**(b)**	Explain the types of molecular motion observed in rubber.	**04**
Q.3	**(c)**	Discuss the characteristic properties of rubber.	**07**
		OR	
Q.3	**(a)**	Write in brief on Poisson's ratio.	**03**
Q.3	**(b)**	Explain the theory of shape factor.	**04**
Q.3	**(c)**	Discuss the conditions which are necessary for rubber like elasticity in polymer.	**07**

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Q.4	**(a)**	Which characteristics the pigments would have for use in rubber compound?	**03**
Q.4	**(b)**	Summarize the general laws of friction.	**04**
Q.4	**(c)**	Discuss the theory of vibration isolation with respect to rubber.	**07**
		OR	
Q.4	**(a)**	Explain the term refractive index with respect to polymer.	**03**
Q.4	**(b)**	Summarize the laws of friction with respect to rubber.	**04**
Q.4	**(c)**	Discuss the characteristic features of sinusoidal vibrations.	**07**
Q.5	**(a)**	Explain the term 'true solution'.	**03**
Q.5	**(b)**	What do you mean by 'Tyndall Effect'? Also give it's cause.	**04**
Q.5	**(c)**	Differentiate the lyophilic sols and lyophobic sols.	**07**
		OR	
Q.5	**(a)**	What do you mean by colloidal solution?	**03**
Q.5	**(b)**	Differentiate the multi molecular colloids and macromolecular colloids.	**04**
Q.5	**(c)**	Discuss the purification methods of colloids.	**07**

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