Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-III Regular / Remedial Examination December 2010

Subject code: 132601

Subject Name: Basic Rubber Science

Date: 13 /12 /2010 **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)**	**(i)** Explain the term Poisson's Ratio. Give its relationship with shear modulus and bulk modulus respectively for isotropic system.	**04**
		(ii) Define the following terms: (1)Static Friction (2) Rolling Friction (3) Kinetic Friction	**03**
	(b)	Explain the term Surface Tension. Derive its expression by following capillary method.	**07**
Q.2	**(a)**	**(i)** Explain the structure property relations in rubber.	**04**
		(ii) Why is it difficult to make rubber product with close dimension tolerance?	**02**
	(b)	Write a short note on Emulsions.	**08**
		OR	
	(b)	Explain the overview of basic concepts and behavior for rubber technology.	**08**
Q.3	**(a)**	**(i)** Write about characteristic features of sinusoidal vibrations.	**06**
		(ii) What do you mean by convective mode of heat transfer? Explain the convective heat transfer coefficient.	**04**
	(b)	Diffusion and solubility of compounding ingredients in rubber are of great practical interest-explain this statement with suitable examples.	**04**
		OR	
Q.3	**(a)**	**(i)** Discuss the phenomenon of vibration isolation by taking example of rubber mountings.	**06**
		(ii) State the Fick's Law of mass transfer.	**02**
	(b)	Which method is used to determine the thermal conductivity of bad conductor? Elaborate it.	**06**
Q.4	**(a)**	**(i)** Write down the major applications of inhibitors.	**02**
		(ii) How the behavior of low molecular weight compound differs from polymer?	**04**
	(b)	Discuss in detail about Free Radical Polymerisation.	**08**
		OR	
Q.4	**(a)**	**(i)** Explain the Degree of Polymerisation with suitable example.	**02**
		(ii) How the chain polymerization differs from step polymerization.	**04**
	(b)	Discuss in detail about Emulsion Polymerisation technique with its merits and demerits.	**08**
Q.5	**(a)**	Discuss the types of colloidal systems with examples.	**07**
	(b)	Write about three types of colloids with examples.	**07**
		OR	
Q.5	**(a)**	Explain the preparation of colloidal solution by condensation methods and chemical methods respectively.	**07**
	(b)	Explain about electrophoresis, electro-osmosis and isoelectric point.	**07**

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