

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III • EXAMINATION – WINTER 2013****Subject Code: 132601****Date: 03-12-2013****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) Discuss in detail about the characteristics of colloidal solution. **07**

Q.1 (b) Answer the following

i Write down the general rules for polymer solubility. **04**

ii What do you mean by gel rubber? Give the classification of gel. **03**

Q.2 (a) Discuss in detail about the solubility parameter. **07**

Q.2 (b) Answer the following

i Explain in brief about the various stages associated with rubber goods manufacturing. **04**

ii Write in brief on segmental motion. **03**

OR

Q.2 (b) Answer the following

i Write about the situations in which viscoelastic properties of rubber are observed. **04**

ii Define the term refractive index. How refractive index of the pigment is measured? **03**

Q.3 (a) Explain the characteristic features of sinusoidal vibration. **07**

Q.3 (b) Answer the following

i Write down the laws of regular reflection and refraction respectively. **04**

ii Write in brief on kinetic friction. **03**

OR

Q.3 (a) Explain the given terms with respect to rubber: (i) Shear Modulus (ii) Bulk Modulus **06**

Q.3 (b) Answer the following

i Write a short note on elastic collisions observed in rubber. **05**

ii Give the name of apparatus which is used to measure the surface tension. Also list its major components. **03**

Q.4 (a) Discuss in detail about the emulsion polymerization technique. **07**

Q.4 (b) Answer the following

i Explain the propagation step with respect to free radical polymerization. **05**

ii Define the following terms: (i) Initiator (ii) Inhibitor **02**

OR

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Q.4	(a)	List the type of ionic polymerization. Explain any one in detail.	07
Q.4	(b)	Answer the following	
	i	What do you mean by step polymerization? Which conclusions can be drawn regarding to step polymerization?	05
	ii	Which factors would be considered before the choice of the polymerization technique?	02
Q.5	(a)	Differentiate the true solution and colloidal solution.	07
Q.5	(b)	Answer the following	
	i	Explain the types of colloidal systems.	05
	ii	What do you mean by associated colloids?	02
OR			
Q.5	(a)	Discuss in detail about the applications of colloids.	07
Q.5	(b)	Answer the following	
	i	Explain the types of colloidal solution with its characteristics.	05
	ii	What do you mean by macromolecular colloids?	02
