Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-Vth Examination December 2010

Subject code: 152605

Subject Name: Rubbers: Manufacturing & its applications

Date: 21 /12 /2010 **Time: 03.00 pm - 05.30 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)**	Write about the applications of rubber products in Mechanical Engineering & Automobile Engineering field.	**07**
	(b)	1. Explain the temperature dependence of elastic moduli of Caoutchouc, Elastomer and Duromer.	**04**
		2.How the distinction is made between Cautchouc and Rubber?	**03**
Q.2	**(a)**	Give the Classification of Rubber additives used in rubber compounds and list their general features.	**07**
	(b)	Write the Characteristics of Acrylonitrile monomer & its importance as a monomer in polymer field and explain the method of production in detail.	**07**
		OR	
	(b)	Write about Isoprene monomer & its importance in polymer field and explain the method of production in detail.	**07**
Q.3	**(a)**	Explain the Curing system used for vulcanization of Chloroprene Rubber (CR) and write its important properties.	**07**
	(b)	Give the structure of Ethylene-Propylene Copolymer (EPM) with its advantages and disadvantages. Explain the ways to overcome its disadvantage in detail.	**07**
		OR	
Q.3	**(a)**	Why SBR is widely used in Tyre Production? Write the structure, vulcanizate properties and applications of Styrene Butadiene Rubber..	**07**
	(b)	Write the synthesis reaction of Acrylonitrile Butadiene Rubber (NBR) and explain its chemistry and vulcanizate properties.	**07**
Q.4	**(a)**	How the molecular weight determination is carried out by Scattering method?	**08**
	(b)	Explain the Solubility parameter with respect to Polymer Solution	**06**
		OR	
Q.4	**(a)**	Give the name of method to determine Viscosity Average Molecular Weight. Explain it in detail.	**08**
	(b)	1. Explain the effect of Molecular Weight on Softening Temperature and Tensile Strength respectively with suitable example.	**03**
		2.Explain the term "Gel Rubber" with its classification.	**03**
Q.5	**(a)**	"Rubber is a versatile material." Justify the statement in terms of its applications in Defense field.	**07**
	(b)	Your company receives an order of 3 lakh pieces of rubber suspension bush to be supplied annually to a car manufacturing company. The weight of a bush is 60 gm. You are asked, (i) To give the cost of bush to your boss. (ii)To record type of press and its steam requirement	**07**
		OR	
Q.5	**(a)**	Discuss the Overview of the manufacturing of Cellular Rubber Product.	**07**
	(b)	Your company has to make a microcellular sheet of size 20"x 20"x 12 mm thickness. Find its manufacturing cost considering 25% expansion in mold release.	**07**

****