Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2015

Subject code: 2142602 **Date:03/06/2015**

Subject Name: Natural Rubber Science & Technology

Time: 10:30am-1.00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q. 1 Answer the following. **(14)**

(i) List the conventional grades of Natural Rubber.

(ii) Express the relation between Polystyrene molecular weight and Tensile strength for Polystyrene grafted Natural Rubber.

(iii) How the nature of liquid affect on diffusion process in rubber?

(iv) Write the importance of Partitioning agent in Powdered rubber and list the name of any two Partitioning agents.

(v) Define and explain the term: "Transmissibility".

(vi) Write the basic types of chemical modifications in Natural Rubber.

(vii) What do you mean by Liquid rubber? Draw its network structure.

Q. 2 (a) Answer the following:

(i) List the important grades of Technically Specified Rubbers (TSR). Explain about any two in detail. **(05)**

(ii) What do you mean by Storage hardening reaction in Natural Rubber? **(02)**

Q. 2 (b) Discuss about preparation of Graft Co-Polymer by direct mixing reaction of two polymers. **(07)**

OR

Q. 2 (b) List the basic stages in the development of NR graft Co-Polymer and explain the grafting chemistry with reaction mechanism. **(07)**

Q. 3 (a) "The presence of small amount of Proteinaceous materials in Natural Rubber is beneficial for Off-shore engineering applications of Natural Rubber."Justify the statement. **(07)**

(b) Draw the schematic diagram for Tensile, Compression and Shear test geometries to study low temperature crystallization process and explain it. **(07)**

OR

Q. 3 (a) Discuss about general features of Wax blooming. **(07)**

(b) Short note on "Crystallization in bridge bearings". **(07)**

Q. 4 (a) List the basic methods for preparation of Powdered rubber and explain any one in detail. **(07)**

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	(b)	Give the reaction mechanism for Epoxidation of Natural Rubber and explain its chemistry.	**(07)**

OR

Q. 4	**(a)**	Write about the advantages of powdered & particulate rubber technology.	**(07)**
	(b)	Discuss about basic Degradation reactions in Natural Rubber.	**(07)**
Q. 5	**(a)**	Derive the formula to find the shear modulus for bonded rubber components.	**(04)**
	(b)	Write about the basic classification of Liquid rubber.	**(03)**
	(c)	Draw the schematic diagram for Reclaimator process and explain it in detail.	**(07)**

OR

Q. 5	**(a)**	How the Puncture strength of rubber component can be measured? Explain with diagram.	**(04)**
	(b)	Write in brief about the preparation of Liquid telechelic polymer.	**(03)**
	(c)	What do you mean by Reclaimed rubber? Discuss about its testing, properties and applications in detail.	**(07)**

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