

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-IV Examination-Nov/Dec-2011

Subject code: 142602

Date: 28/11/2011

Subject Name: Natural Rubber Science & Technology

Time: 02.30 pm -5.00 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) Answer the following. (14)

- (i). Write the significance of SMR CV grade of natural rubber. How it is produced?
- (ii). Explain the function of partitioning agent. Give example of partitioning agent.
- (iii). List any two properties & applications of ENR.
- (iv). Explain the term: Induction period.
- (v). List the stages of operations for manufacturing reclaimed rubber.
- (vi). Explain the term: Transmissibility of rubber component.
- (vii). Comparison between Conventional rubbers & Liquid rubbers by schematic illustration of network.

Q.2(A) Answer the following.

- (i) Short note on SMRL. (04)
- (ii) Write about the advantages of TSR over conventional grades of Natural Rubber. (03)

Q.2(B) List the name of methods used for preparation of powdered rubber and explain in detail. (07)

OR

Q.2(B) List any four principle advantages of powdered rubber and justify it. (07)

Q.3(A) Answer the following.

- (i) In engineering applications Rubber is not normally used in tension. Give reasons. (04)
- (ii) Explain the term: Hysteresis. (03)

Q.3(B) List the classes of commercially established Liquid elastomers and explain any one in detail. (07)

OR

Q.3(A) List the environmental factors which affect the life and service of rubber components and explain it in detail. (07)

Q.3(B) Write about the requirements of telechelic polymer for the development as a general purpose elastomer. (07)

-----P.T.O.-----

Q.4(A) Answer the following.

- (i) What do you mean by “ Graft copolymer” . List the stages for the preparation of natural graft copolymer. (04)
- (ii) Represent the grafting reaction of polymer on cis-1,4 polyisoprene. (03)

Q.4(B) Represent the model for water absorption. Explain the diffusion mechanism of water in rubber. (07)

OR

Q.4(A) List the grafting conditions for polystyrene and explain any one in detail. (07)

Q.4(B) Explain the general features of wax blooming. (07)

Q.5(A) Explain the digester process for manufacturing of reclaimed rubber. (07)

Q.5(B) Answer the following.

- (i) List the stages of crystallization process for rubber and explain any one in detail. (04)
- (ii) Represent the epoxidation reactions for cis-1,4 polyisoprene. (03)

OR

Q.5(A) Explain the properties of reclaimed rubber as a compounding ingredient. (07)

Q.5(B) Answer the following.

- (i) Describe the crystallization process by thermodynamic formula. (04)
 - (ii) Give classification of reactions used for modification of natural rubber. (03)
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