Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER • 2015

Subject code: 152605 **Date:15/05/2015**

Subject Name: Rubbers: Manufacturing & its Applications (Institute Elective –II)

Time: 02.30pm-05.00pm **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) Write the chemical name of Natural Rubber and draw its structure.

(ii) What do you mean by Hose?

(iii) Give the reaction mechanism for Sohio process.

(iv) Which synthetic rubber having excellent flame resistance property? Why?

(v) Give reaction mechanism for synthesis of Butyl rubber.

(vi) Define the term: "Polymerisation".

(vii) List the applications of rubber in Automobile field.

Q. 2 (a) Design a formulation for 45 shore A hardness rubber bush and Calculate the specific gravity and compound cost. **(07)**

Q. 2 (b) Write the importance of Initiators in polymerization and explain its mechanism by giving reaction mechanism. **(07)**

OR

(b) Discuss about Emulsion polymerization with the help of schematic diagram. **(07)**

Q. 3 (a) Discuss about the influence of Acrylonitrile to Butadiene ratio on properties of Nitrile rubber. **(07)**

(b) Draw the flow diagram for production of Silicon rubber and explain it in detail. **(07)**

OR

Q. 3 (a) List the basic grades of Neoprene rubber and write the difference between them. **(07)**

(b) Draw the flow diagram for solution polymerisation of Polybutadiene rubber and explain it in detail. **(07)**

Q. 4 (a) List the process for manufacturing of Isoprene monomer and explain any two by giving reaction mechanism. **(07)**

(b) List the methods to determine the relative molecular mass of polymers and explain any one in detail. **(07)**

OR

Q. 4 (a) Give reaction mechanism for production of Styrene monomer by Dehydrogenation method and explain it. **(07)**

(b) What do you mean by Solubility parameter? Explain this with respect to Polymer Solution. **(07)**

Q. 5 (a) Answer the following:

(i) List the Reinforcing materials used in Hose manufacturing and write the function of any one. **(03)**

(ii) What do you mean by Neutral Angle? Write its importance in Hose Design. **(04)**

(b) List the applications of Rubber in Chemical Engineering and medical field. **(07)**

OR

Q. 5 (a) What is Aspect Ratio? Give the detailed difference between Radial tyre and Bias tyre in terms of Aspect Ratio. **(07)**

(b) List the applications of Rubber in Aerospace and Sports field. **(07)**

****