Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VI • EXAMINATION – SUMMER • 2015**

**Subject code: 162602** **Date: 04/05/2015**

**Subject Name: Synthetic Rubbers**

**Time: 10.30am-01.00pm** **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) Give the reason behind the development of Synthetic Rubbers.

(ii) Draw the structure and chemical name of Hypalon rubber.

(iii) What do you mean by Carboxylated Rubber?

(iv) Write any two advantageous properties and limitations of Thiokol Rubber.

(v) Which Rubber is known for its excellent Flame Resistance property? Why?

(vi) Write the basic types of Flouro carbon Elastomers.

(vii) Give the synthesis reaction for Styrene Butadiene Rubber (SBR).

**Q. 2** (a) Draw the flow diagram for production of Polybutadiene rubber by Solution Polymerization technique and explain the process in detail. **(07)**

**Q. 2** (b) List the basic grades of Neoprene Rubber and give comparison between them. **(07)**

**OR**

(b) Give the reaction mechanism for synthesis of Neoprene Rubber and explain its production with the help of flow diagram. **(07)**

**Q. 3** (a) Discuss the reason for the requirement of third monomer in synthesis of Ethylene Propylene Diene Methylene Rubber (EPDM).Write their name and draw the structures. **(07)**

(b) Short note on Carbon Black Master Batch Styrene Butadiene Rubber. (CBMBSBR). **(07)**

**OR**

**Q. 3** (a) Write the beneficial properties and applications of Ethylene Propylene Diene Methylene Rubber (EPDM). **(07)**

(b) Draw the flow diagram for the manufacturing of Styrene Butadiene Rubber (SBR) by Continuous process and describe it in detail. **(07)**

**Q. 4** (a) List the basic vulcanization methods for Butyl Rubber and explain it in detail with reaction mechanism. **(07)**

(b) Which Polymerization technique is used for production of Nitrile Rubber? Explain the process with flow diagram. **(07)**

**OR**

**Q. 4** (a) Discuss about problems occurred during the processing of Butyl Rubber. **(07)**

(b) Draw the structure of monomers used in synthesis of Nitrile Rubber and Explain the influence of monomer ratio on properties of Nitrile Rubber. **(07)**

**Q. 5** (a) “Silicone rubber is a versatile rubber.” justify the statement. **(07)**

(b) Write the name of catalyst system used for production of Isoprene Rubber (IR). Give comparison between them. **(07)**

**OR**

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| **Q. 5** | (a) | Why Silicone Rubber is partially Organic and Partially Inorganic in nature? Explain its chemistry by giving structures of various types of Silicone Rubber. | **(07)** |
| | (b) | Write the synthesis reaction, compounding, properties and applications of Isoprene Rubber (IR). | **(07)** |

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