

THIRD SEMESTER DIPLOMA EXAMINATION IN POLYMER
TECHNOLOGY—MARCH, 2013

SYNTHETIC RUBBER

[Time : 3 hours

(Maximum marks : 100)

PART—A

(Maximum marks : 10)

Marks

I Answer the following questions in one or two sentences. Each question carries 2 marks.

1. Distinguish cold SBR and hot SBR.
2. Why Di-ene monomers are used in the polymerisation of EPDM ?
3. Write the structures of CSM and polysulphide rubbers.
4. Expand the following terms :
HTPB, CTPB, XNBR and XSBR.
5. Define thermoplastic elastomers with two examples. (5×2=10)

PART—B

(Maximum marks : 30)

II Answer *any five* of the following. Each question carries 6 marks.

1. (a) How Isoprene monomer is prepared ? 3
(b) Distinguish the characteristics of Natural rubber with poly Isoprene. 3
2. (a) How Isobutylene monomer is prepared ? 3
(b) Name the curing systems used in butyl rubber. Why peroxide system not used with butyl rubber ? 3
3. (a) How Acrylonitrile monomer is prepared ? 3
(b) What are the characteristics of silicone polymers ? 3
4. (a) Explain the curing mechanism of polychloroprene with relevant structures. 3
(b) Compare the characteristics of polysulphide rubber and CSM. 3
5. (a) Write the monomers of fluoro carbon elastomers with structures. 3
(b) What are Halo-butyl rubbers ? Write two example and its structures. 3

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|---|-------|
| 6. (a) What are the characteristics and application of Acrylic rubbers ? | 3 |
| (b) Name the curing systems and structures of the following polymers : | |
| (i) Polypropylene rubber. | |
| (ii) Ethylene acrylic rubber. | |
| (iii) Chlorinated polyethylene rubber. | 3 |
| 7. (a) Write the advantages and applications of following blends : | |
| (i) NBR—PVC (ii) NR— HSR (iii) NR—PBD | 3 |
| (b) What are the principles of modifying elastomers into thermoplastic elastomers ? | 3 |

PART—C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each question carries 15 marks.)

UNIT—I

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| III | (a) Explain the production, properties and applications of Butyl (IIR) rubber with a flow diagram. | 8 |
| | (b) Explain the compounding and vulcanisation system used in SBR with a typical formulation. | 7 |

OR

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| IV | (a) Explain the production, properties and application of EPDM with a neat flow diagram. | 8 |
| | (b) Explain the compounding and curing systems used in polyisoprene with a formulation. | 7 |

UNIT—II

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|---|---|---|
| V | (a) Explain the production, properties and applications of poly-chloroprene with a neat flow diagram. | 8 |
| | (b) Explain the compounding and curing systems of silicone rubbers with a typical formulation. | 7 |

OR

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| VI | (a) Explain the manufacture, properties and applications of CSM. | 8 |
| | (b) Explain the compounding and vulcanisation mechanism of silicone rubbers with a typical formulations. | 7 |

UNIT—III

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|-----|--|---|
| VII | (a) Explain the manufacture of Brobutyl and Chloro butyl rubbers with typical flow diagrams. Give their properties and applications. | 8 |
| | (b) How hydroxy terminated SBR is prepared ? Give its properties and applications. | 7 |

OR

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| VIII | (a) Explain the production, properties and applications of fluoro carbon elastomers with structures. | 8 |
| | (b) Explain the curing mechanism of Epichlorohydrin rubber and polypropylene rubbers with typical formulations. | 7 |

UNIT—IV

- IX (a) Explain the production of thermoplastic elastomers with a suitable example. Give the advantages and disadvantages of thermoplastic elastomers. 8
- (b) Explain the common procedures adopted for NBR-PVC blend. Give its advantages and different grades. 7
- OR
- X (a) Explain the production of S-B-S thermoplastic elastomers. Give its properties and application. 8
- (b) What are Ionomers and Hydrogels? Describe their properties and application with relevant structures. 7
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