

[74]

SARDAR PATEL UNIVERSITY  
M.Sc. Chemistry, (Semester III) Examination  
(Industrial Polymer Chemistry)

Monday, 24<sup>th</sup> October, 2016

Time: 02.00 am to 05.00 pm

PS03CIPC02: Manuf., Properties and Applications of  
Thermosets & Rubbers

Total Marks: 70

Note: Figures to the right indicates Marks.

**QUE.1 Give the appropriate answer of the following Multi Choice Questions. 8**

- a. Natural rubber is in \_\_\_\_\_ form.  
(i) trans (ii) meso (iii) cis (iv) crystal
- b. Monomer of natural synthetic rubber is-  
(i) isopropene (ii) isoprene (iii) isopropyne (iv) ibuprofene
- c. The nature of ethylene-propylene copolymer is-  
(i) brittle (ii) hard (iii) elastic (iv) pasty
- d. Hexa yield-  
(i) 6mole CH<sub>2</sub>O + 4 mole N<sub>2</sub> (ii) 4 mole NH<sub>3</sub> + 6 mole methanal  
(iii) 6 mole NH<sub>3</sub> + 4 mole CH<sub>2</sub>O (iv) 4 mole NH<sub>3</sub> + 4 mole CH<sub>2</sub>O
- e. Plywood made by use of -  
(i) UF resin (ii) Polyurethane (iii) Shallac (iv) Lignin
- f. Araldite is-  
(i) Paint paste (ii) Varnish (iii) Adhesive (iv) only epoxy resin
- g. Network polyester are use for manufacturing of-  
(i) Plasticizers (ii) Adhesives (iii) Lubricants (iv) Paints
- h. Polymerization of dichloro dimethyl silane with water yield-  
(i) Polyhydrated silane (ii) polydimethyloxysilane (iii) Polydimethyl-chloro-oxysilane (iv) none of above

**QUE.2 Explain following (Any Seven). 14**

- i Differentiate Natural and Synthetic rubber.  
ii List of curing agents for epoxy resin (with name and chemical structure).  
iii Metal Naphthenates  
iv List the Acceleratar for rubber vulcanization.  
v Differences of Novalac and Resols.  
vi Properties and applications of Nitrile rubber.  
vii Various anhydrides for polyester formations.  
viii Synthetic route for Phenol and Bisphenol.  
ix Cross-linking structure of MF resin.

- QUE.3**
- A. Describe the production of natural rubber. 6
- B. Give a note on derivatives of Natural rubber. 6
- OR**
- B Describe accelerated sulfur vulcanization.
- QUE.4** 6
- A. Describe the manufacturing process for any one synthetic rubber.
- B. Give a note on Thiokol rubber. 6
- OR**
- B. Give a note on EPDM rubber.
- QUE.5**
- A Describe the manufacturing process for production of Phenol and Melamine. 6
- B Describe the cross-linking process of UF resin. 6
- OR**
- B Give a note on polyurethane cast elastomers.
- QUE.6**
- A Describe the manufacturing process for commercial unsaturated polyester. 6
- B What is Alkyd resin? Explain the types of alkyd resins. Describe the fatty acid process for alkyd resin. 6
- OR**
- B Describe the manufacturing process of commercial epoxy resin with reaction route.

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