

Seat No. \_\_\_\_\_

Enrollment No. \_\_\_\_\_

**CVM UNIVERSITY**  
**M.Sc. (Polymer Science & Technology) Semester-I**

**Course Code: 101340102**

**Course Title: Industrial Polymers**

**Total Number of Printed Pages: 02**

**Date: 24/02/2021**

**Time: 10:00 AM to 12:00 PM**

**Maximum Marks: 60**

**Instructions:**

- Attempt all questions.
- Numbers to the right indicate full marks for each question.
- Make suitable assumptions wherever necessary.

**Q. 1 (a)** Answer the following multiple choice questions. **(08)**

- (1) \_\_\_\_\_ resin is not an amino plast.  
(i) Novolak (ii) Urea-formaldehyde (iii) Melamine-formaldehyde (iv) None of above.
- (2) \_\_\_\_\_ atmospheric pressure employed in Philips process to make polyethylene.  
(i) 50-60 (ii) 30-40 (iii) 70-100 (iv) 100-120
- (3) \_\_\_\_\_ is used as an inhibitor in unsaturated polyesters.  
(i) Hydroquinone (ii) Styrene (iii) Chlorendic acid (iv) All of above.
- (4) \_\_\_\_\_ is a copolymer made from styrene.  
(i) SAN (ii) ABS (iii) both i & ii (iv) not i & ii
- (5) Stearic acid and metal stearates used as lubricants in the range of \_\_\_\_\_ for phenolic molding powder.  
(i) 1-5% (ii) 2-5% (iii) 5-7% (iv) 1-3%
- (6) Sodium lauryl sulphate is used as a \_\_\_\_\_.  
(i) plasticizer (ii) initiator (iii) surfactant (iv) buffer agent
- (7) \_\_\_\_\_ process used for polyethylene manufacturing.  
(i) Standard oil (ii) Standard solvent (iii) Condensation (iv) None of above.
- (8) \_\_\_\_\_ % of NaOH solution is used to make commercial solid epoxy resin.  
(i) 10 (ii) 20 (iii) 30 (iv) 40

**(b)** Answer the following (Fill in the blanks and True or False) **(08)**

- (1) Butane 1,4 diol is used as a reactive diluents in UPE resin.  
True or False
- (2)  $\alpha$  - methyl styrene is used for low styrene emission resin.  
True or False
- (3) Polypropylene soluble in hydrocarbon solvent at above 80°C  
True or False

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- (4) Novolak type phenolic resin contain higher ratio of aldehyde  
True or False
- (5) Epoxy resin is synthesized from epichlorohydrin and \_\_\_\_\_.
- (6) \_\_\_\_\_ define as polymers based on unsaturated hydrocarbon containing  
at least one double bond.
- (7) \_\_\_\_\_ used as a raw material for vinyl chloride.
- (8) Expanded polystyrene prepare by \_\_\_\_\_ polymerization technique.

**Q.2** Attempt **any six** of the following. (12)

- (1) Explain purification of styrene.
- (2) Write synthesis of phenol from benzene.
- (3) Give a reaction scheme of methacrylic acid and methyl methacrylate.
- (4) Write down conversion of polyvinyl acetate in to Polyvinyl alcohol.
- (5) Explain structure and properties of polyvinyl chloride.
- (6) Explain Phillips process for manufacturing of polyethylene.
- (7) Define gel coat and top coat.
- (8) Explain glycidyl ester resin.

**Q.3** Describe in detailed Ziegler process used for the manufacturing of polyethylene. (08)

**OR**

**Q.3** Discuss following. (08)

1. Chlorosulphonated polyethylene.
2. Polypropylene.

**Q.4** Write a note on copolymers based on styrene. (08)

**OR**

**Q.4** Discuss raw material manufacturing, polymerization, properties and application of polymethyl methacrylate. (08)

**Q.5** Define epoxide resin. Discuss raw material manufacturing and resin preparation with reaction mechanism. (08)

**OR**

**Q.5** Describe in detail about raw material synthesis and general manufacturing procedure of unsaturated polyester resin (UPE) with its applications. (08)

**Q.6** Write a note on following. (08)

1. Resol resin.
2. Melamine formaldehyde resin.

**OR**

**Q.6** Describe in detail about raw material manufacturing, resin synthesis, properties and application of urea formaldehyde resin. (08)

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