

VI SEMESTER B.Sc. DEGREE EXAMINATION, MARCH/APRIL 2015

(UG-CCSS)

Elective Course

Chemistry

CH6 B20 (E4)—CHEMISTRY AND TECHNOLOGY OF POLYMERS

Time : Three Hours

Maximum : 30 Weightage

I. Answer *all* the questions. Each question carries a **weightage** $\frac{1}{4}$. This section contains multiple choice, fill in the blanks, and one word answer question :

1 A thermoplastic fibre is _____

- (a) Nylon. (b) Bakelite.
(c) polystyrene. (d) PVC.

2 Which one of the following is an example for an **elastomer** ?

- (a) Polyester. (b) Polypropylene.
(c) Poly vinylchloride. (d) Polybutadiene.

3 Natural rubber is :

- (a) *Cis*-polyisoprene. (b) *Trans*-polyisoprene.
(c) Chloroprene. (d) Gutta-percha.

4 Molecular weight of strongly cross linked polymer is _____

- (a) 100. (b) 1000.
(c) 10000. (d) Infinite.

5 Elongation is maximum for :

- (a) Neoprene. (b) Butyl rubber.
(c) Natural rubber. (d) Thiokol.

6 Suggest a method for producing hollow plastic articles ?

- (a) Blow moulding. (b) Transfer moulding.
(c) Injection moulding. (d) compresion moulding.

7 The **stereoisomerism** in polymer chain is defined as _____

8 Unsaturated monomers are usually polymerized by _____ method.

Turn over

- 9 Polytetrafluoroethylene is prepared by _____ polymerization using peroxide catalyst.
- 10 The temperature at which an amorphous polymer undergoes a change from rubbery state to glassy state is termed as _____
- 11 In rubber processing, mixing by smearing and wiping is called _____
- 12 The most suitable moulding technique for producing thermoplastic articles is _____

(12 x $\frac{1}{4}$ = 3 weightage)

II. Answer all the *nine* questions. Each question carries a weightage of 1 :

- 13 What is meant by anionic polymerization ?
- 14 Define tensile property of polymers.
- 15 What are crystallites ?
- 16 What is meant by kneading in rubber processing ?
- 17 Write a short note on milling.
- 18 Define the 'extrusion' process of rubbers.
- 19 What is plasticizer ?
- 20 What is meant by viscoelasticity of polymers ?
- 21 Define extrusion moulding.

(9 x 1 = 9 weightage)

III. Answer any *five* questions. Each question carries a weightage of 2 :

- 22 Differentiate thermoplastic and thermosetting polymers ? Give *one* example for each.
- 23 What is ring opening polymerization ? Write the mechanism.
- 24 What are silicones ? Give their uses.
- 25 Differentiate tear and abrasion resistance of an elastomer.
- 26 Describe the differences between foaming and thermofoaming.
- 27 Write a note on vulcanization of rubber.
- 28 Compare pressure bag and vacuum bag moulding techniques.

(5 x 2 = 10 weightage)

IV. Answer any *two* questions. Each carries a weightage of 4 :

- 29 Define the following terms :
- (i) Functionality of monomer.
 - (ii) Polydispersity index.
 - (iii) Number average molecular weight.
 - (iv) Degree of polymerization.

30 Write notes on :

(i) Coordination polymerization. (ii) Step growth polymerization.

(iii) Zeigler-Natta catalyst. (iv) Tacticity.

31 (i) What are elastomers ? Give any *four* examples.

(ii) Discuss the structure and composition of natural rubber.

(2 x 4 = 8 weightage)