

**CVM UNIVERSITY****M.Sc. (Polymer Science & Technology) Semester-I Examination – 2021****Friday, 26<sup>th</sup> February 2021****10:00 a.m. to 12:00 p.m.****101340103: Polymer Materials & Recycling****Note:** (1) Attempt all questions.**Total marks: 60**

(2) Figures to the right indicate full marks.

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

(1) \_\_\_\_\_ can be used as starting material for the preparation of hexamethylene diamine.

(a) Adipic acid (b) benzene (c) sebacic acid (d) None of these

(2) \_\_\_\_\_ can be used as filter fabric for filter hot gases in coal fired power plant.

(a) Nylon (b) polycarbonate (c) polyimide (d) polyanhydride

(3) If the screen pack is blocked, \_\_\_\_\_ also increases.

(a) Temperature in the system (b) pressure in the system (c) shear on the material (d) all of above

(4) \_\_\_\_\_ technique is produced feed stock for polyolefin production

(a) Low temp Pyrolysis (b) Hydrogenation (c) Gasification (d) All of these

(5) Tertiary recycling is a type of \_\_\_\_\_ recycling.

(a) chemical (b) mechanical (c) both a &amp; b (d) none of these

(6) \_\_\_\_\_ catalyst can be used in the polymerization of glycolide

(a) boron nitrile (b) stannous octate (c) both a &amp; b (d) none of these

(7) \_\_\_\_\_ can be used as starting material for the preparation of caprolactam.

(a) Cyclohexane (b) Cyclohexanol (c) Both a &amp; b (d) None of these

(8) \_\_\_\_\_ crosslink can form in thermoplastic elastomer.

(a) physical (b) chemical (c) both a &amp; b (d) none of these.

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

(1) Primary recycling is known as mechanical recycling

True/false

(2) Caprolactam is used for the preparation of Nylon 6

True/false

(3) Sebacic acid is used for the preparation of Nylon 6 10

True/false

(4) The SEBS polymers are produced by hydrogenation of SBS

True/false

- (5) Water is used as a chain transfer agent in polycaprolactone.  
True/false
- (6) \_\_\_\_\_ thermoplastic elastomer used in shoe soiling.
- (7) \_\_\_\_\_ types of contamination has removed by the use of magnet.
- (8) In Nylon 6 10, first 6 digit indicate \_\_\_\_\_.

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

- (1) Which are different reaction routes for the preparation of Nylon
- (2) Why plastics need to be sorted? Explain it
- (3) Explain sorting of plastics based on their identification code.
- (4) Write a reaction scheme for preparation of Adipic acid. Explain it
- (5) Write a preparation of sebacic acid
- (6) Write a note on polyacetal
- (7) Explain solid state polymerization with an example.
- (8) Explain polyamide elastomer

**Q.3** Write a preparation of caprolactam. Explain synthesis and production process of Nylon 6. (08)

**OR**

**Q.3** Write a reaction scheme and preparation of Bisphenol A, phosgene and diphenylcarbonate. Explain both polymerization process of polycarbonate along with its properties and applications (08)

**Q.4** Enlist thermal conversion techniques use in plastic recycling. Explain it (08)

**OR**

**Q.4** Give an account on contaminants, size reduction, and washing used in plastic recycling. (08)

**Q.5** Give an account on polyphosphazene (08)

**OR**

**Q.5** Write a note on (08)

1. Polylactide
2. polycaprolactone

**Q.6** Discuss crosslinking phenomenon take place in thermoplastic elastomer and Explain styrenics thermoplastic elastomer. (08)

**OR**

**Q.6** Explain thermoplastic polyester elastomer and polyurethane elastomer (08)