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Reg. No. : .....

Name : .....

Fourth Semester M.Sc. Degree Examination, May 2020

Polymer Chemistry

PC 242 : POLYMER CHEMISTRY – II

(2018 Admission)

Time : 3 Hours Max. Marks : 75

SECTION – A

Answer **two** among (a), (b) and (c) from each question. Each sub-question carries **2** marks. :

1. (a) What do you mean by Plasma polymerization?

   (b) What are the advantages of immobilised enzymes?

   (c) What is a hybrid nanocomposite? Give examples.

2. (a) What is an artificial enzyme? How are they formed?

   (b) What are the different types of biometric systems? Give two main functions.

   (c) Define isoelectric point and Zwitterion.

3. (a) What are piezoelectric polymers? Give examples.

   (b) What are Ionomers? Give their applications.

   (c) Explain electron beam lithography.

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4. (a) Explain the terms fibre tenacity and felting.

(b) Explain the term Bingham plastics and thixotropy.

(c) What are polymer alloys? Give their applications.

5. (a) What are the advantages of two roll mill mixing techniques?

(b) Explain the different methods to improve the flame resistance of polymers.

(c) What are specific features of neoprene compared to other rubbers?

(10 × 2 = 20 Marks)

SECTION – B

Answer either (a) or (b) from each question. Each sub question carries **5** marks.

6. (a) Describe the method for preparing polystyrene capped gold nanoparticles.

(b) Discuss the various reactions that polystyrene can undergo.

7. (a) Write a note on degradation of polymers by micro-organisms.

(b) Explain the importance and applications of gene technology in medicine.

8. (a) Illustrate the mechanism of conduction in polyaniline.

(b) Explain photoconductive and pyroelectric polymers.

9. (a) State and explain Fick's law and Henry's law.

(b) Draw the stress strain curve for rubber, plastics and fibers. Describe the significance of tensile and tear properties of polymers.

10. (a) Write the preparation and applications of polyimide and PMMA.

(b) What are the roles of stabilizers and plasticizers and antioxidants in the manufacture of PVC products?

(5 × 5 = 25 Marks)

SECTION – C

Answer **any three** questions. Each question carries **10** marks. :

11. What is meant by mastication? How does it done in rubber compounding? Discuss the function of twin-screw extruders.

12. Explain Newtonian an non-Newtonian fluids with examples and discuss the significance of mechanical properties such as of tensile strength, compression set and abrasion resistance of polymers.

13. What are the structural criteria required for the formation of liquid crystalline polymers? Discuss their applications.

14. Discuss the applications of Genetic Engineering in medicine, agriculture and biology.

15. Explain the mechanism and kinetics of atom transfer radical polymerization (ATRP). Give their applications.

(3 × 10 = 30 Marks)
