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Reg. No. :

**Code No. : 20022 E Sub. Code : JMCH 5 A/
SECH 5 A**

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2021.

Fifth Semester

Chemistry

Major Elective — POLYMER CHEMISTRY

(For those who joined in July 2016-2019)

Time : Three hours

Maximum : 75 marks

PART A — ($10 \times 1 = 10$ marks)

Answer ALL questions.

Choose the correct answer.

1. As the crystallinity increases the brittleness of the polymer _____.
(a) increases (b) decreases
(c) moderate (d) remains constant
2. Which of the following polymers are used as fibre?
(a) Natural rubber (b) Polychloroprene
(c) Nylon (d) Polystyrene

3. Glass transition temperature of polystyrene is
(a) 100°C (b) -100°C
(c) 50°C (d) 0°C
4. The concentration of polymers in solution are often expressed as
(a) molarity (b) molality
(c) g/dl (d) volume %
5. The factors of solution polymerization is (are)
(a) nature of solvent (b) concentration
(c) temperature (d) all the above
6. The principle feature of a polycondensation is
(a) Stable intermediate
(b) Rate of condensation is independent
(c) Both (a) and (b)
(d) None of the above
7. Which of the following is not an example of thermoplastic?
(a) Vulcanised rubber
(b) Nylon
(c) Polyester
(d) PVC

8. Plastic resin is used in the paint industry as
(a) catalyst (b) ion exchanger
(c) inhibitor (d) coolant
9. The polymer used to manufacture laminates which can withstand fairly high temperature without degradation is
(a) Polypyrrole (b) Dental polymer
(c) Silicone polymer (d) All the above
10. The polymer used to make the artificial contact lens is
(a) Polymethyl Methacrylate(PMMA)
(b) PVC
(c) Silicone
(d) Polyurethane

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) What are addition and condensation polymers? Explain with suitable examples.

Or

- (b) Explain briefly the group transfer polymerization with suitable example.

12. (a) What is meant by T_g ? Explain its importance.

Or

- (b) Explain briefly the relationship between the molecular weight and the degree of polymerization.

13. (a) What is meant by reinforcing polymerization processing? Explain its properties.

Or

- (b) Discuss briefly the melt polycondensation.

14. (a) How is melamine formaldehyde resin prepared? Mention its uses and important properties.

Or

- (b) How is neoprene rubber prepared? Write down its properties and uses.

15. (a) Explain the preparation of polysulphur nitrile. Write down its properties and uses.

Or

- (b) Write a short note on artificial kidney.

PART C — ($5 \times 8 = 40$ marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) What are polymers? How are they classified based on structure and crystallinity?

Or

- (b) Explain briefly the differences between thermoplastics and thermosetting plastics with suitable examples.

17. (a) Explain the following :

- (i) Number average molecular weight
- (ii) Viscosity-average molecular weight.

Or

- (b) How are polymers degraded by thermal, photo and oxidative methods?

18. (a) Explain the suspension and solution polymerization techniques.

Or

- (b) What are moulding? Explain briefly any two moulding polymer processing.

19. (a) How is polyacrylonitrile prepared? Explain its properties and uses.

Or

- (b) How is urea formaldehyde resin prepared? Explain briefly its preparation and properties.
20. (a) How are high temperature and fire resistant polymers prepared? Explain briefly their properties.

Or

- (b) Write down the preparation, properties and uses of polyphenylene, polypyrrole and polyacetylene.
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