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N – 6254

Reg. No. :

Name :

Fourth Semester M.Sc. Degree Examination, June 2022

Chemistry

CH/CL/CA 241 : CHEMISTRY OF ADVANCED MATERIALS

(2016–2019 Admission)

Time : 3 Hours

Max. Marks : 75

SECTION – A

Answer any **two** from each questions a, b or c. Each question carry **2** marks.

1. (a) What are 0D, 1D and 3D nano materials, explain with example?
(b) Define surface plasmon resonance.
(c) Explain the structure of Fullerenes with an example.
2. (a) Differentiate between SEM and TEM.
(b) Explain the principle behind AFM.
(c) Write two applications of XRD.
3. (a) Explain free radical polymerisation.
(b) Discuss GPC method for determination polymer molecular weight.
(c) What is meant by Glass transition temperature?
4. (a) Name any two polymeric reagents.
(b) What are liquid crystalline polymers, give examples?
(c) Explain conducting polymers with examples.

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5. (a) Explain the property electrochromism.
(b) What are spiropyrans, give few applications of them?
(c) Explain pseudo elasticity.

(10 × 2 = 20 Marks)

SECTION – B

Answer either a or b of each question. Each question carry 5 marks.

6. (a) Explain CVD method for preparing nano particles.
(b) Describe the Sol-Gel methods for the preparation of nanoparticles.
7. (a) Explain the principle behind STEM and its application.
(b) Explain the basics of EDAX analysis.
8. (a) Describe stereochemistry of polymers taking suitable.
(b) Distinguish between linear and cyclic polymerization.
9. (a) Describe synthesis and application of conducting polymers.
(b) Comment on the use of polymers used in drug delivery processes.
10. (a) Describe chemistry behind photochromic compounds.
(b) What are shape memory polymers?

(5 × 5 = 25 Marks)

SECTION – C

Answer any **three** questions, each carry **10** marks.

11. Illustrate on various methods for the synthesis and application of metal nano particles.
12. Describe on various types of carbon nano materials, its properties and applications.
13. Discuss any two methods for the determination of polymer molecular weight.



14. Explain the properties of polymers used as catalysts.
15. (a) Describe on :
- (i) Piezoelectric
 - (ii) Thermoelectric Materials.
- (b) Discuss properties and applications of self-healing and pH sensitive polymers.

(3 × 10 = 30 Marks)

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