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Reg. No. : ....

Name : ....

Fourth Semester M.Sc. Degree Examination, July 2023

Chemistry/Analytical Chemistry

CL 241/CH 241: CHEMISTRY OF ADVANCED MATERIALS

(2020 Admission Onwards)

Time : 3 Hours   Max. Marks : 75

PART – A

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

1. (a) What is quantum confinement?

    (b) Write a short note on nano toxicology

    (c) What are 0D, and 3D nano materials, give examples

2. (a) What is STEM?

    (b) Write any two application of diffuse reflectance spectroscopy

    (c) Explain the principle behind SEM

3. (a) Explain chain transfer in polymerisation

    (b) Define Tacticity of a polymer

    (c) Explain glass transition temperature

4. (a) What are conducting polymers, explain with examples?

   (b) Write one method to synthesise poly acetylenes

   (c) Define optical lithography technique

5. (a) Define electrochromic property.

   (b) Write a note on pH sensitive polymers

   (c) Explain photochromism with example

(10 × 2 = 20 Marks)

PART – B

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

6. (a) Explain the relation between size and properties of the nano materials.

   (b) Describe CVD method for synthesising nano materials

7. (a) Explain the basics of X-ray fluorescence spectroscopy

   (b) Describe the application of dynamic light scattering method.

8. (a) Distinguish between cationic and anionic polymerisation

   (b) How DSC can be applied to know the thermal stability of polymer.

9. (a) What are polymeric reagents, explain with suitable example.

   (b) Give brief account on polymer based LED materials.

10. (a) Explain the chemistry behind photochromism of azobenzenes.

    (b) Describe the concept of pseudo elasticity.

(5 × 5 = 25 Marks)

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PART – C

11. Explain the synthesis and application of metal nano particles.

12. Elaborate the role of polymers in drug delivery and catalysis.

13. (a) Describe (i) piezoelectric (ii) thermoelectric materials.

    (b) What are photoresponsive polymers, explain with example

14. Give a description on liquid crystalline polymers

15. Discuss the basic concept and application of a. XPS and b. TEM

$(3 \times 10 = 30$ Marks$)$

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