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Reg. No. : .....

Name : .....

Fourth Semester M.Sc. Degree Examination, July 2024

Chemistry/ Analytical Chemistry

CH 241/ CL 241 : CHEMISTRY OF ADVANCED MATERIALS

(2020 Admission Onwards)

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 nano biosensors, give two examples?

   (b) Explain hydrothermal method for synthesis of nano materials.

   (c) What are Fullerenes, explain with example.

2. (a) What is EDAX?

   (b) How XRF can be used to identify elements present in a sample?

   (c) Explain dynamic light scattering method for nano material characterisation.

3. (a) What is chain transfer polymerisation?

   (b) What is auto acceleration in radical polymerisation?

   (c) Define glass transition temperature.

P.T.O.

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

(b) What are photo responsive polymers?

(c) What are hetero chain polymers?

5. (a) What are halochromic materials?

(b) What is the concept of pseudo elasticity?

(c) What are mechanophores?

(10 × 2 = 20 Marks)

SECTION – B

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

6. (a) Explain how size of the nano materials influence their properties.

(b) Explain CVD method for the synthesis of nano materials.

7. (a) Describe how XPS analysis can be used for nano material characterisation.

(b) Briefly describe various types of electron microscopic techniques.

8. (a) Explain the kinetics of free radical polymerisation.

(b) Explain number average method for the determination polymer molecular weight.

9. (a) Briefly discuss the synthesis and application of polyaniline.

(b) Comment on the use of polymers in drug delivery processes.

10. (a) Explain the chemistry behind photochromism in spiroxazines and quinones.

(b) Write a short note on synthesis and application of ferrofluids.

(5 × 5 = 25 Marks)

SECTION – C

Answer **any three** questions, each question carries **10** marks.

11. Elaborate on various methods for the synthesis of nano materials.

12. Describe how different spectroscopic technique can be used for nano materials characterisation.

13. Give a brief account on stereochemistry of polymers.

14. Discuss various types of liquid crystalline polymers.

15. Explain with suitable examples the following type of material.

    (a) Piezoelectric

    (b) Chromogenic

    (c) Thermoelectric

    (d) Magnetostrictive

(3 × 10 = 30 Marks)

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