10/8/22

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N – 6250

Fourth Semester M.Sc. Degree Examination, June 2022

Chemistry/Analytical Chemistry

CH/CL 241 – CHEMISTRY OF ADVANCED MATERIALS

(2020 Admission)

Time : 3 Hours

Max. Marks : 75

SECTION – A

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

1. (a) What are halochromic materials?

   (b) What is the concept of pseudo elasticity?

   (c) What are self-healing polymers?

2. (a) Name any two polymeric reagents.

   (b) What are liquid crystalline polymers, give examples?

   (c) Explain conducting polymers with examples.

3. (a) Differentiate between SEM and TEM.

   (b) Explain the property photoluminescence.

   (c) Write two applications of XRD.

4. (a) What are nano biosensors, give two examples?

   (b) Define surface plasmon resonance

   (c) What are Fullerenes, explain with example.

5. (a) Explain free radical polymerisation.

   (b) Write one method for determination of polymer molecular weight.

   (c) What is meant by Degree of Crystallinity?

$(10 \times 2 = 20$ Marks$)$

SECTION – B

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

6. (a) Explain the principle behind TEM and its application.

   (b) Describe the Sol-Gel method for the preparation of nanoparticles.

7. (a) Describe the application of Raman spectroscopy in nano material characterisation.

   (b) Explain the basics of EDAX analysis.

8. (a) Distinguish between linear and cyclic polymerization.

   (b) Explain number average and mass average molecular weight of polymer.

9. (a) Describe synthesis and application of polyaniline.

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

10. (a) Describe synthesis and application of ferrofluids.

    (b) What are shape memory polymers?

$(5 \times 5 = 25$ Marks$)$

SECTION – C

Answer any three question. Each question carry 10 marks.

11. Describe any two methods for the determination of molecular weights of polymers.

12. Elaborate on various types of carbon nano tube and its application.

13. Illustrate on various types of polymerisation technique with suitable example.

14. Describe on (a) Quinanes (b) Thermochromic (c) Magnetostrictive (d) Spiropyrans materials.

15. Illustrate on AEM and STM techniques for characterisation of nano materials.

$$(3 \times 10 = 30 \text{ Marks})$$

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