



Reg. No. :

Name :

IV Semester M.Sc. Degree (CBSS – Reg/Suppl. (Including Mercy Chance)/Imp.)
Examination, April 2021
(2014 Admission Onwards)

CHEMISTRY

CHE 4C.12 : Interdisciplinary Topics and Instrumentation Techniques

Time : 3 Hours

Max. Marks : 60

SECTION – A

Answer **all** questions in **one** word or **one** sentence. **Each** question carries **one** mark.

1. Name the molecular forces acting in supra molecular assembly.
2. What are the two types of molecular switching devices ?
3. What is three R's in green chemistry ?
4. Give one example for ionic liquid.
5. Give an example for a 2-D nano-materials.
6. Define g value in ESR spectroscopy.
7. Name any one electrochemical techniques.
8. Give an example for a green solvent other than water. **(8×1=8)**

SECTION – B

Answer **any eight** questions in **two** or **three** sentences. **Each** question carries **two** marks.

9. What are cyclophanes ?
10. Define kramers degeneracy.
11. Give any two examples for an organic free radicals.

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12. What is lithography ?
13. What is the principle of AFM technique ?
14. Explain nano-composite materials with examples.
15. What is Lande's splitting factor ?
16. What are the application of DTA ?
17. What are quantum dots ?
18. Explain top down method for the preparation of nano-materials.
19. Explain sonochemical method for the preparation of nano-materials.
20. Describe briefly thermometric titrimetry.
21. Explain Dopler effect.
22. What is meant by nano CAD ?
23. What are phase transfer catalysts ?
24. What is meant by self-assembly technique ? (8×2=16)

SECTION – C

Short paragraph questions. Answer **any four**. Each question carries **3** marks.

25. Give an account on carbon nano-structures.
26. Explain the principle of Mossbauer spectroscopy.
27. Explain the concept of atom economy in green reactions.
28. Distinguish between SEM and TEM technique.
29. Explain application of nano-materials in gene mapping and protic engineering.
30. Briefly explain the various concepts in supramolecular chemistry.
31. Explain chemical isomer shift.
32. Describe the role of cyclodextrin in host-guest chemistry. (4×3=12)



SECTION – D

Essay type questions. Answer **any four**. Each question carries **6** marks.

33. Explain the principles of green chemistry.
34. Compare the classical and green reaction conditions used for the following :
 - i) Aldol condensation
 - ii) Cannizaro reaction
 - iii) Grignard reaction.
35. Describe applications of green preparations.
36. Illustrate the various types supramolecular devices and their applications.
37. Describe on types of molecular forces in supramolecular reactions.
38. What are the different types of molecular receptors ? Explain.
39. Illustrate various methods for the synthesis of nano-materials.
40. Describe the application of nano-materials in different areas.
41. Discuss the scattering methods for characterising nano-materials.
42. Discuss electron spin resonance spectroscopy in detail.
43. Applications of Mossbauer spectroscopy.
44. Describe principle and instrumentation technique in DTA. (4×6=24)