

CHEMISTRY – IV E/M

III - YEAR

UNIT - I

ANALYTICAL AND INDUSTRIAL CHEMISTRY

1. Describe batch extraction in the solvent extraction method?
2. What is counter current extraction? Describe the principles of Craig counter current extraction?
3. Define chromatography? Give a general idea of the different types of chromatography?
4. Explain about thin layer chromatography?
5. Give an account of the technique of ion exchange chromatography?
6. State & Derive a mathematical expression for Beer Lambert's law?
7. Explain the terms (i) Molar absorptivity (ii) Transmittance (iii) Absorbance.
8. Describe with a neat diagram a double beam spectro photometer?
9. How will you determine iron (III) with thiocyanate?
10. How will you estimate 'mn' in $MnSO_4$ in steel?
11. Explain about ascending, Descending paper chromatography?
12. Explain about G.L.C. chromatography?
13. Write about types of transitions in molecules?
14. Define auxochrome & chromophore give examples for each one?
15. Write about different types of shifts in the molecules?
16. Explain about types of fundamental modes of vibrations of molecules?
17. Explain about fundamental vibrations / degrees of freedom of
 - i) H_2O
 - ii) CO_2molecules
18. Write about differences Hn IR spectroscopy & Raman spectroscopy?
19. Explain about IR spectroscopy of simple harmonic oscillations of Diatomic molecules?
20. Explain about anharmonicity of polyatomic molecules?
21. Write about types of bands in IR spectroscopy?
22. Explain about finger print region in IR spectroscopy?
23. Write about quantum theory of Raman spectroscopy?

24. Explain about pure rotational Raman spectroscopy?
25. Explain about principle of H¹-NMR spectroscopy?
26. Define shielding & Deshielding effects in H¹-NMR?
27. Write about spin-spin splitting / coupling in H¹-NMR?
28. Explain about different types of couplings in H¹-NMR?
29. Draw the H¹-NMR spectroscopy of (i) 1, 1, 2 tri bromo ethane?
 ii) Ethanol iii) Toluene iv) Acetophenone

UNIT - II

30. Explain about the terminology used in drugs.
 i) Pharmacophore ii) Pharmacodynamics iii) Pharmacokinetics
31. Describe chemical name, generic name, & trade names with examples taken from drugs?
32. Discuss classification of drugs based on their structure & therapeutic activity with one example each?
33. Define metabolites & antimetabolites give example for each?
34. Explain about preparation and separation of penicillins?
35. Explain about CD-4 and CD-8 cells?
36. Explain about immune system?
37. What is meant by HIV-AIDS? Name the drugs available for prevention of AIDS?
38. What is the difference b/n drugs & medicines?
39. Discuss the need of conversion of drugs into medicines?
40. Describe the classification of formulations (Form wise, dose wise with examples)?
41. Discuss synthesis and therapeutic activity of the following drugs
 i) L-Dopa ii) Chloroquin iii) Albuterol iv) Ciprofloxacin
42. Explain about types of pesticides?
43. Explain about plant growth regulators?
44. Explain the action of pheromones & hormones?
45. Discuss synthesis and uses of pesticides
 i) DDT ii) Malathion iii) Endrin iv) 2, 4 D. v) Endosulphon
46. Explain about P.T.C.?

47. Write about microwave – Ultrasound assisted synthesis of
 - i) Cannizaro reaction
 - ii) Strecker synthesis
 - iii) Aldokondensation
48. Explain about solid support synthesis in Green chemistry?
49. Explain about selection of solvents in green chemistry?
50. Explain diels alder reactions are 100% atom economic reactions?

UNIT - III

51. Define macromolecules? Write about number coverage degree of polymerization (\bar{M}_n) and weight any degree of polymerization (\bar{P}_w)
52. Define polymers? Write the classification of polymers?
53. Explain about (i) Free radical mechanism (ii) cationic mechanism in addition polymerization?
54. Explain the mechanism of condensation polymerization with example?
55. Explain about Ziegler – Natta catalyst polymerization?
56. Explain about stereo chemistry of polymers?
57. Write about the kinetics of free radial polymerization?
58. Define
 - i) The number average molecular mass (\bar{M}_n) and
 - ii) The mass average molecular mass (\bar{M}_w)
59. Equal number of molecules with $M_1 = 15000$ and $M_2 = 150000$ are mixed. Calculate the two types of molar masses?
60. Explain about viscosity method for the determination of molecular mass of polymers?
61. Discuss about osmotic pressure method for the determination of molecular mass of polymers?
62. Write the synthesis & applications of the following polymers.
 - i) P.V.C.
 - ii) Teflon
 - iii) Nylon 6, 6
 - iv) Terylene
63. Explain about Biodegradability?
64. Calculate the degree of polymerization of polymers of chloroprene with any molecular weight 81000 (Molecular mass of chloroprene is 88.5).
65. Define super conductivity? Write the characteristics of super conductors?
66. Explain about Type-I & Type-II super conductors?
67. What are composite materials? How are they classified on the basis of reinforcing materials?

68. Write about nanostructured materials?
69. Explain about fullerenes? Write a short note on carbon nano tubes?
70. Write about meissner effect?
71. Write about production of nano particles? Write the applications of nano materials?
72. Define catalysis. Give characteristics of catalysis?
73. Discuss the kinetics of Acid-base catalysed reactions?
74. Explain about Homogeneous, Heterogeneous catalysis? Give examples for each?
75. What are enzymes? How do they act as catalysts? Explain about factors affecting enzyme catalysis?
76. Derive michaelismenten equation, the kinetics of enzyme reactions?
77. Explain with mechanism of the following.
 - i) Hydrolysis of esters
 - ii) Aldol condensation
 - iii) Mutarotation of glucose
78. Explain about Nomen cloture & classification of enzymes?
79. Write about differences between enzymes & catalysts?
80. Write about Langmuir – Hinshelwood mechanism of Heterogeneous catalysis?