



TOPICS FOR INTERNAL ASSESSMENT ASSIGNMENTS: 2019-20

Course: M.Sc. CHEMISTRY (Previous)

Important Notes: (1) Students are advised to read the enclosed instructions separately before writing the assignments.

(2) Out of 15 Internal Assignment marks per paper, 5 marks will be awarded for regularity (attendance) to Counseling/ Contact Programme classes pertaining to the paper. Therefore, the topics given below are only for 10 marks each paper.

Answer ANY ONE Question (1 or 2) from Each Paper. Each question carries TEN marks.

Paper I: Analytical Chemistry

1. a) Discuss the basic theory of ion exchange chromatography and its applications.
b) What is error? How it is classified? Explain Q test and F test.
2. a) With suitable examples, discuss the reactions in non-aqueous solvents.
b) Discuss the technique of precipitation from homogeneous solution.

Paper II: Inorganic Chemistry

1. a) Describe the preparation, structure and bonding of Diborane.
b) What are noble gas compounds? Discuss the structure and bonding of XeF_2 and XeO_2F_2 .
2. a) Describe the preparation, structure and bonding of Borazine.
b) Discuss the basic postulates of VSEPR theory? Deduce the structure of NH_3 , H_2O and ClF_3 .

Paper III: Organic Chemistry

1. a) Discuss the mechanism of any two electrophilic substitution reaction in aromatic compounds.
b) Explain the aromaticity of annulenes and heteroannulenes.
2. a) Write a note on cis-trans and E-Z notations of geometrical isomers.
b) Discuss the optical isomerism in lactic acid and tartaric acid.

Paper IV: Physical Chemistry

1. a) Discuss the general characteristics of catalytic reactions.
b) Explain the concept of hard and soft acids.
2. a) Discuss the postulates of quantum mechanics.
b) Explain the construction and working of pH type glass electrode and solid membrane electrode.



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TOPICS FOR INTERNAL ASSESSMENT ASSIGNMENTS: 2019-20
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Paper V: Analytical Chemistry

1. Discuss in detail, the basic principles and instrumentation involved in fluorimetry and phosphorimetry.
2. a) Using Jablonski diagram explain different luminescence transitions.
b) Discuss the various factors influencing chemical shift and spin-spin coupling in NMR spectroscopy.

Paper VI: Inorganic Chemistry

1. a) Discuss the isomerism in coordination compounds.
b) Discuss the preparation, properties, structure and bonding of ferrocene.
2. a) Discuss the polymerization of olefins by using Zeigler Natta catalyst.
b) Discuss the general properties of f-Block elements.

Paper VII: Organic Chemistry

1. Discuss the various Spectroscopic techniques for structural elucidation of organic compounds.
2. a) Explain the mechanism and application of Norrish type-I and Norrish type-II reactions.
b) Discuss the structural elucidation of terpenoides.

Paper VIII: Physical Chemistry

1. a) What is a cyclic process? Explain Carnot's cycle and its importance.
b) Explain the physical significance of entropy.
2. a) Explain the nuclear fission and fusion reactions.
b) Explain the applications of Mossbauer spectroscopy.
