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**TOPICS FOR INTERNAL ASSESSMENT ASSIGNMENTS: 2018-19**  
**Course: M.Sc. CHEMISTRY (Previous)**

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*Important Notes: (1) Students are advised to read the separate enclosed instructions before beginning the writing of 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.*

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

**Paper I: Analytical Chemistry**

1. a) Explain the theory and applications of HPLC.  
b) Discuss the acid-base and redox titrations with suitable example.
2. a) Explain the theory of solvent extraction.  
b) Discuss the theory of Gel permeation chromatography.

**Paper II: Inorganic Chemistry**

1. a) Discuss the Band theory of solids.  
b) What are pseudohalogens? Discuss the preparation, properties and structure of thiocyanogens.
2. a) Explain the preparation, structure and bonding in Phosphazenes.  
b) Discuss the d-orbital splitting in square-planar complex.

**Paper III: Organic Chemistry**

1. a) With suitable examples explain the various types of elements of symmetry.  
b) Discuss the mechanism of aromatic nitration and halogenation.
2. a) Describe the mechanism and stereochemistry of  $S_N1$  reaction.  
b) Discuss the synthesis and reactions of pyrrole and pyridine.

**Paper IV: Physical Chemistry**

1. a) Explain the standard hydrogen electrode and saturated calomel electrode.  
b) Discuss the basic principle, instrumentation and application of electrogravimetry.
2. a) Discuss the Bohr's theory of hydrogen spectrum and give its applications.  
b) Explain the importance and limitations of thermodynamics.

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