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TOPICS FOR INTERNAL ASSESSMENT ASSIGNMENTS (2009-10)
Course: **M.Sc. CHEMISTRY** (Final Year)

Note: *Students are advised to read the separate enclosed instructions before beginning the writing of assignments.*

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

Answer ANY ONE Question from each paper (i.e., 1, 2 or 3). Each Question carries 10 Marks.

Paper V: Analytical Chemistry

1. a) What are electromagnetic radiations? Explain the width and intensity of spectral lines during interaction of electromagnetic radiations with matter.
   b) Discuss the energies corresponding to various kinds of radiations, molecular transactions and selection rules in spectroscopy.

2. a) Explain the principle, theory and instrumentation of mass spectrometry.
   b) What is chemical shift? Discuss the factors influencing the chemical shift.

3. a) Discuss the theory and application of ESR spectroscopy.
   b) Discuss the different types of burners used in flame spectrophotometer.
   c) What are the applications of atomic absorption spectroscopy?

Paper VI: Inorganic Chemistry

1. What are electron transfer reactions? With illustrative example explain the mechanisim of inner and outer sphere electron transfer reactions.

2. a) What are transition elements? Discuss the characteristic properties of d-block elements.
   b) Give the comparison of d-block elements with f-block elements.

3. a) What are metalloenzymes? Write the structure and explain the importance of Vitamin B_{12}-coenzyme.
   b) What is Waker's process? Discuss the mechanism of Waker's process.

Paper VII: Organic Chemistry

1. What are pericyclic reactions? Discuss the electro cyclic and cyclo addition reactions with examples.

2. a) What is Benzil-benzillic acid rearrangement? Describe its mechanism and applications.
   b) Discuss the mechanism of Birth reduction and Micheal addition.

3. Explain the general steps involved in the structural elucidation of terpenoids.

Paper VIII: Physical Chemistry

1 a) What are molecular vibrations? Discuss the classification of vibrations.
   b) Explain the factors influencing vibration frequencies in IR spectra.

2 a) Explain nuclear fission and fusion reactions.
   b) Discuss the importance and applications of nuclear models.
   c) Explain the nuclear fusion using nuclear shell model. Give the merits and limitations of it.

3 a) Discuss the importance of entropy in reversible and irreversible processes.
   b) Discuss Carnort's cycle, efficiency of heat engine and its importance.
   c) What is DSC? Explain the factors affecting DSC.

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