

Paper – I INORGANIC CHEMISTRY

Max. Marks: 25

SECTION – A

Answer the following questions

2 x 10 = 20 Marks

1. a) Explain the effect of π bonding on CFSE of octahedral complexes.
b) Write an essay on experimental evidences for the presence of π bond in metal carbonyls.
2. a) What is meant by magnetic susceptibility? Discuss different types of magnetic behavior.
b) Describe different experimental methods used for the determination of magnetic susceptibility.

SECTION – B

Answer the following questions

1 X 5 = 5 Marks

3. a) Limitations of crystal field theory.
b) Selection rules of electronic spectroscopy.

Paper – II ORGANIC CHEMISTRY

Max. Marks: 25

SECTION – A

Answer the following questions

2 x 10 = 20 Marks

1. What is neighbouring group participation? Describe the criteria of determining neighbouring group participation.
2. Formulate the mechanism of the following rearrangements.
 - a. Wagner-Meerwein rearrangement.
 - b. Hoffmann rearrangement.
 - c. Favorskii rearrangement.

SECTION – B

Answer the following questions

1 X 5 = 5 Marks

3. Discuss the stereochemistry of allenes and biphenyls.

Paper – III PHYSICAL CHEMISTRY

Max. Marks: 25

SECTION – A

Answer the following questions

2 x 10 = 20 Marks

1. Discuss the application of Phase-rule to two component system.
2. Distinguish activity and activity coefficient. How to calculate near ionic activity coefficient.

SECTION – B

Answer the following questions

1 X 5 = 5 Marks

3. Write a note on (i) Crystal planes and (ii) Miller indices.

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Paper – IV SPECTROSCOPY

Max. Marks: 25

SECTION – A

Answer the following questions

2 x 10 = 20 Marks

1. a) Write the mathematical properties of a point group.
b) Explain the classification of molecules in micro-wave spectroscopy.
2. Define Raman effect. Write the classical theory of Raman effect.

SECTION – B

Answer the following questions

1 X 5 = 5 Marks

3. Write short notes on (i) Franck-condol principle (ii) Nuclear overhauser effect.

Paper – V QUANTITATIVE DATA, ANALYTICAL, ELECTRO CHEMICAL AND SEPARATION TECHNIQUES

Max. Marks: 25

SECTION – A

Answer the following questions

2 x 10 = 20 Marks

1. a) Write a brief note on F-test, t-test and Q-test.
b) Explain least square method.
2. a) What are the advantages of dropping mercury electrode.
b) Write the Ilkovic equation and what are the terms involved in it?

SECTION – B

Answer the following questions

1 X 5 = 5 Marks

3. Explain Beer-Lambert's law.

Paper – VI ORGANIC SPECTROSCOPY, DRUG DESIGN, CONFORMATIONAL ANALYSIS, & HETEROCYCLIC COMPOUNDS

Max. Marks: 25

SECTION – A

Answer the following questions

2 x 10 = 20 Marks

1. Write a detailed account of the types of C-13 NMR spectra.
2. Describe the basic principle and instrumentation of mass spectrometry.

SECTION – B

Answer the following questions

1 X 5 = 5 Marks

3. Describe the phases involved in drug metabolism.

Paper – VII ORGANIC PHOTOCHEMISTRY, PERICYCLIC REACTIONS AND ORGANIC SYNTHESIS

Max. Marks: 25

SECTION – A

Answer the following questions

2 x 10 = 20 Marks

1. What norrish type 1 and norrish type 2 cleavage. Describe with suitable examples.
2. Write in detail about the importance of order of events in organic synthesis.

SECTION – B

Answer the following questions

1 X 5 = 5 Marks

3. What is Sharpless asymmetric epoxidation. Formulate its mechanism.

Paper – VIII ADVANCED NATURAL PRODUCTS

Max. Marks: 25

SECTION – A

Answer the following questions

2 x 10 = 20 Marks

1. Write an account of the structural elucidation of Reserpine. Formulate its synthesis.
2. Describe the structural elucidation of Abetic acid.

SECTION – B

Answer the following questions

1 X 5 = 5 Marks

3. What are prostaglandins. Describe their physiological functions.