

Dr.B.R.AMBEDKAR OPEN UNIVERSITY
FACULTY OF SCIENCE
M.Sc. – I year -CHEMISTRY (2025-26 (Old Batch))
Course – I: Inorganic Chemistry

ASSIGNMENT - I

[3x5=15 Marks]

Maximum Marks – 15

Minimum Marks – 06

Instructions to the candidates:

- i) Answer all Questions
- ii) Each question carries 5 marks.

1. Explain Symmetry and Optical activity, Symmetry and Dipole moment.
2. Explain C_n , C_{nh} , D_{nh} , D_{nd} point groups with examples.
3. Explain L-S coupling

ASSIGNMENT - II

[3x5=15 Marks]

Maximum Marks – 15

Minimum Marks – 06

Instructions to the candidates:

- i) Answer all Questions
- ii) Each question carries 5 marks.

1. Explain factors affecting acid hydrolysis reaction.
2. Determination of stability constant by spectrophotometry method.
3. Explain binding mode of CO to metals, and explain about 18 electron rule with examples.

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M. Sc I Year - CHEMISTRY (2025-26 (Old Batch))
COURSE – II: ORGANIC CHEMISTRY

ASSIGNMENT - I

[3x5=15 Marks]

Maximum Marks – 15

Minimum Marks – 06

Instructions to the candidates:

- i) Answer all Questions
- ii) Each question carries 5 marks.

1. a. How are stereoisomers classified on the basis of their internal energy? What are the main characteristic features of configurational and conformational enantiomers and diastereomers.
2. Write a short note on the following.
 - a. Inductive effect
 - b. Cross over experiments and trapping intermediates.
 - c. Addition reactions on carbon-carbon double bond
3. What is neighbouring group participation(NGP). Explain Sulphur, COO⁻, Br, I and Acetate groups involved in NGP substitution reactions.

ASSIGNMENT - II

[3x5=15 Marks]

Maximum Marks – 15

Minimum Marks – 06

Instructions to the candidates:

- i) Answer all Questions
- ii) Each question carries 5 marks.

1. Formulates any two synthesis of the following compounds.
 - a. Anthracene
 - b. Indole
 - c. Isoquinoline
 - d. Carbazole.
2. How are alkaloids classified? Give one example for each class. Discuss the determination of structure and synthesis of papaverine.
3. Draw the structures of cellulose and chitin and explain the complete methylation and Hydrolysis of Amylopectin.

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COURSE – III : PHYSICAL CHEMISTRY

ASSIGNMENT - I

[3x5=15 Marks]

Maximum Marks – 15

Minimum Marks – 06

Instructions to the candidates:

- i) Answer all Questions
- ii) Each question carries 5 marks.

- 1)
 - a. Derive an equation of normalized wave function for particle in one dimensional box.
 - b. Derive wave equation for H-like atoms.
- 2) Explain the following
 - a. Hess's law
 - b. Kirchoff's equation
 - c. Gibbs Duhem equation.
- 3) Define term state function and path functions with suitable examples. State second law of thermodynamics in its various forms.

ASSIGNMENT - II

[3x5=15 Marks]

Maximum Marks – 15

Minimum Marks – 06

Instructions to the candidates:

- i) Answer all Questions
- ii) Each question carries 5 marks.

1.
 - a. Give an applications of polarography.
 - b. discuss about theories of corrosion..
2. What is over voltage? Explain effect of current density on over voltage..
3.
 - a. Explain Lindamann's theory of unimolecular reactions.
 - b. Define quantum yield. And explain for its determination.

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COURSE – IV : Mathematics, Biology, Spectroscopy & Computers (General)

ASSIGNMENT - I

[3x5=15 Marks]

Maximum Marks – 15

Minimum Marks – 06

Instructions to the candidates:

- i) Answer all Questions
- ii) Each question carries 5 marks.

For mathematics:

1. a. Find the derivative of $f(x) = \frac{x \cos x}{\sqrt{1+x^2}}$.
- b. Solve $x(x-2)\frac{dy}{dx} - 2(x-1)y = x^3(x-2)$
2. a. Explain the terms fundamental bands, over tones and hot bands.
- b. Explain the following terms: Chromophore, Auxochrome, Bathochromic Shift, Hypochromic Shift,, Hypsochromic Shift and Hyperchromic Shift.
3. What is Raman effect? Explain the appearance, selection rules and applications of pure rotational Raman and vibrational Raman spectral lines.

For biology:

1. a. Give an account of the structure and functions of cell organelles.
- b. what are different levels of structural organisation of proteins? Explain with suitable examples.
2. a. Explain the terms fundamental bands, over tones and hot bands.
- b. Explain the following terms: Chromophore, Auxochrome, Bathochromic Shift, Hypochromic Shift,, Hypsochromic Shift and Hyperchromic Shift.
3. What is Raman effect? Explain the appearance, selection rules and applications of pure rotational Raman and vibrational Raman spectral lines.

ASSIGNMENT - II

[3x5=15 Marks]

Maximum Marks – 15

Minimum Marks – 06

Instructions to the candidates:

- i) Answer all Questions
- ii) Each question carries 5 marks.

1. Explain
 - a. Chemical shift
 - b. Spin-spin Coupling
 - c. Coupling constant.
2. Explain Nitrogen rule, types of Peaks in mass spectra and High resolution mass spectroscopy.
3. What is an algorithm and flow chart? Draw a flow chart to find the maximum among three numbers.