

DR. B. R. AMBEDKAR OPEN UNIVERSITY – HYDERABAD.

Department of Chemistry

Assignments Question Paper – 2025-26

M.Sc (Chemistry), First Year- Semester - II

Course Code : MSc CHE 22301, Course – 1 : Inorganic Chemistry -2

[Max . Marks - 30

[Min. Marks - 12

Assignment- I

[3x5=15 Marks]

Instructions to the Candidate

- i) Answer All Questions
 - ii) Each Question carries 5 Marks
1. Write a note on acid hydrolysis reaction mechanism of octahedral metal complexes.
 2. What are the cross reaction? Discuss the significance of Marcus-Hush theory.
 3. Write a note on L-S coupling.

Assignment - II

[3x5=15 Marks]

Instructions to the Candidate

- i) Answer All Questions
 - ii) Each Question carries 5 Marks.
1. Write a note on organo metallic compounds with suitable examples.
 2. Comment on a Biological role of Na^+ , K^+ and Cl^- .
 3. Write briefly on the structural aspects of chlorophyll.

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Department of Chemistry
Assignments Question Paper – 2025-26
M.Sc. (Chemistry), First Year - Semester - II
Course Code: MSc CHE 22302, Course – 2 : Organic Chemistry - 2
[Max. Marks - 30]
[Min. Marks - 12]

Assignment- I
[3x5=15 Marks]

Instructions to the Candidate

- i) Answer All Questions
 - ii) Each Question carries 5 Marks
1. Draw the possible conformations for ethane, n-butane, 1,2-dihaloethane derivatives, ethylene glycol and stilbene dichloride, cyclo butane and cyclopentane. Predict stable conformation. Define aromaticity and write the Frost Musulin diagrams and explain the aromaticity of conjugated monocyclic polyenes.
 2. Explain the synthesis and properties of Anthracene, cyclopentinium ion and Tropylium ion. Give the characteristic features of pericyclic reactions and classification.
 3. Draw the molecular orbitals of 1,3,5 hexatriene, 2,4-pentadienyl system and explain symmetry properties with respect to C_2 and m-symmetry. Analyze the reaction conditions of $[\pi^4+\pi^2]$ cycloaddition using FMO method

Assignment- II
[3x5=15 Marks]

Instructions to the Candidate

- i) Answer All Questions
 - ii) Each Question carries 5 Marks
1. Define NGP? Explain the mechanism NGP involving oxygen (O), Sulphur (S), Halogen (X= Cl and Br). Describe the aromatic S_N^2 and benzyne mechanism with suitable example.
 2. Discuss about Aliphatic S_E^2 mechanism, explain mechanism of β -elimination reactions. Discuss any three preparations and properties of Carbocation, carbanion and free radicals.
 3. Write the mechanism of a. Pinacol-pinacolone rearrangements. B. Baeyer Villiger oxidation, Hofmann rearrangement, Curtius rearrangement, Beckmann rearrangement and Fries rearrangement.

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Assignments Question Paper – 2025-26

M.Sc. (Chemistry), First Year - Semester - II

Course Code: MSc CHE 22303, Course – 3:Physical Chemistry - 2

[Max. Marks - 30

[Min. Marks - 12

Assignment- I

[3x5=15 Marks]

Instructions to the Candidate

- i) Answer All Questions
- ii) Each Question carries 5 Marks

1. Construct the wave function for H_2^+ ion according to M.O. method. Write the comparison between MOT and VBT.
2. Define fugacity and fugacity coefficient. Derive the fugacity from graphical method and Gibbs duhem method.
3. Write a note on a) Variation principle b) Rotational partition function and vibrational partition function.

Assignment- II

[3x5=15 Marks]

Instructions to the Candidate

- i) Answer All Questions
- ii) Each Question carries 5 Marks

1. Define quantum yield. Derive the quantum yield of fluorescence and phosphorescence process.
2. Write a note on a) BCS theory of superconductivity b) SEM and TEM methods.
3. Derive Stern-Volmer equation. Write the applications of nanomaterials.

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Assignments Question Paper – 2025-26

M.Sc (Chemistry), First Year - Semester - II

Course Code : MSc CHE 22304, Course – 4: Computers and Spectroscopy - 2

[Max. Marks - 30]

[Min. Marks - 12]

Assignment- I

[3x5=15 Marks]

Instructions to the Candidate

- i) Answer All Questions
 - ii) Each Question carries 5 Marks
1. Write note on a. operating systems and commands. b. Control statements in 'C'.
c. Functions in Python.
 2. Explain the principle involved in ESR Spectroscopy, Hyperfine and superfine splitting. explain evidence of covalency in metal complexes.
 3. Explain the principle and types of Photo electron Spectroscopy, Describe ESCA.

Assignment- II

[3x5=15 Marks]

Instructions to the Candidate

- i) Answer All Questions
 - ii) Each Question carries 5 Marks
1. Explain the Principle of Mass Spectrometry, Nitrogen Rule, Ion-production Techniques and various kinds of peaks in mass spectrum.
 2. Describe HRMS. Discuss Retro Diel's Alder, McLafferty rearrangement fragmentation pattern.
 3. Explain various type of ^{13}C NMR Spectra, factors affecting on chemical shift, coupling in ^{13}C NMR and applications of ^{13}C nmr in reaction mechanism.