

ASSIGNMENT - 1, DEC - 2016.

M.Sc. (PREVIOUS) FIRST YEAR DEGREE

CHEMISTRY

PAPER- I : GENERAL CHEMISTRY

Maximum : 30 MARKS

Answer ALL questions.

- 1) What is the difference between atomic and molecular spectroscopy?
 - 2) What is the principle of microwave spectroscopy?
 - 3) Write briefly about the classification of bands in ultraviolet spectroscopy.
 - 4) Discuss the diatomic rotator in IR spectroscopy with suitable example.
 - 5)
 - i) Discuss the theory of microwave spectroscopy?
 - ii) Write a note on Isotopic effect in rotation spectra?
 - 6)
 - i) Explain briefly the rotation spectra of rigid rotor and non-rigid rotor?
 - ii) Describe the spectra of linear molecules by taking CO₂ and HCl as examples.
 - 7)
 - i) Write a note on the electronic spectra of diatomic molecules?
 - ii) Explain the rotational fine structure of electronic vibrational transition in visible spectroscopy?
 - 8)
 - i) Write a note on simple harmonic oscillation quantization of vibrational motion in IR?
 - ii) Write a short notes on the diatomic vibrating rotator in IR spectroscopy?
-

ASSIGNMENT - 2, DEC - 2016.

M.Sc. (PREVIOUS) FIRST YEAR DEGREE

CHEMISTRY

PAPER- I : GENERAL CHEMISTRY

Maximum : 30 MARKS

Answer ALL questions.

- 1) Write briefly about linear and non-linear regression?
 - 2) How can you minimise the errors in analytical analysis?
 - 3) Write a note on basic components of computers?
 - 4) Explain Do statements with one inner loop?
 - 5)
 - i) Explain the sampling techniques used in solid transmission and storage of samples?
 - ii) What is confidence interval and determine the confidence interval when σ is known and the confidence interval when σ is unknown?
 - 6)
 - i) Explain the types and importance of minimization of errors?
 - ii) Explain briefly about Gaussian distribution?
 - 7) Write a note on:
 - i) Arithmetic statements
 - ii) Arithmetic expressions
 - 8) Write a programm on:
 - i) Rate constant of a first order reaction.
 - ii) Beer's Law by least squares method?
-

ASSIGNMENT - 1, DEC - 2016.

M.Sc. (PREVIOUS) FIRST YEAR DEGREE

CHEMISTRY

PAPER- II : INORGANIC CHEMISTRY

Maximum : 30 MARKS

Answer ALL questions.

- 1) Explain the Heisenberg's uncertainty principle.
 - 2) Explain degeneracy and normalization of wave function.
 - 3) Explain J-J and L-S coupling schemes.
 - 4) Explain Fajan's rule and Born Heber cycle.
 - 5) Deduce the Schrodinger wave equation for an electron in a box.
 - 6) Write a note on:
 - i) Wave function and its physical interpretation.
 - ii) Spin and orbital angular momentum.
 - 7) Compare and contrast VB and MO methods.
 - 8) Explain different types of hybridization. Explain the dipole-dipole, and dipole-induced – dipole hydrogen bonding.
-

ASSIGNMENT - 2, DEC - 2016.

M.Sc. (PREVIOUS) FIRST YEAR DEGREE

CHEMISTRY

PAPER- II : INORGANIC CHEMISTRY

Maximum : 30 MARKS

Answer ALL questions.

- 1) Describe the Jahn – Teller's effect on geometries of d⁹ complexes.
 - 2) Discuss the CFSE and colour of transition metal ions.
 - 3) Explain the basic ideas for inner and outer sphere mechanism with examples.
 - 4) Explain the structural properties of silicones.
 - 5) What is meant by CFSE? Write the differences between the crystal field splitting of 'd' orbitals in octahedral and tetrahedral geometries.
 - 6) Describe the pH method for the determination of stability of metal complexes with examples.
 - 7) Discuss the ligand substitution reactions of S_N¹ and S_N² in octahedral complexes.
 - 8) Write the preparation, properties and structures of carbides.
-

ASSIGNMENT - 1, DEC - 2016.

M.Sc. (PREVIOUS) FIRST YEAR DEGREE

CHEMISTRY

PAPER- III : ORGANIC CHEMISTRY

Maximum : 30 MARKS

Answer ALL questions.

- 1) Write a short note on conjugation and cross-conjugation.
 - 2) Explain about stereospecific synthesis and stereoselective synthesis with suitable examples.
 - 3) Write briefly on kinetic and thermodynamic control.
 - 4) a) Explain about Non-classical carbocations with suitable examples?
b) Explain the S_N^1 reaction at a vinylic carbon.
 - 5) i) Explain the concept of Hyper conjugation and Tautomerism.
ii) What are Non-Benzenoid Aromatic compounds? Explain the aromaticity of any four Non-Benzenoid Aromatic compounds.
 - 6) i) Describe the methods of resolution.
ii) Explain the conformational isomerism in cyclohexane.
 - 7) i) Discuss the role of kinetics in formulating reaction mechanisms.
ii) What are Carbenes and Nitrenes? How they are generated? Give structure.
 - 8) i) Write the mechanism of S_N^2 and S_N^1 reactions.
ii) What is Anchimeric assistance? Explain by involving phenyl group as Neighbouring group.
-

ASSIGNMENT - 2, DEC - 2016.

M.Sc. (PREVIOUS) FIRST YEAR DEGREE

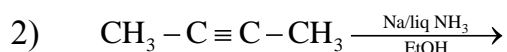
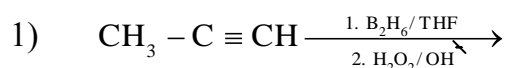
CHEMISTRY

PAPER- III : ORGANIC CHEMISTRY

Maximum : 30 MARKS

Answer ALL questions.

- 1) Explain briefly about Ipso-substitution.
- 2) Explain the sandmeyer reaction and its mechanism.
- 3) Write the mechanism of Wittig reaction.
- 4) State and explain the Hofmann and the Saytzeff rules with suitable examples.
- 5)
 - i) Explain about Diazonium coupling and Gattermann – Koch reaction.
 - ii) Write a short note on Allylic Halogenation.
- 6)
 - i) Write a note on Huns-diecker reaction and Auto-oxidation.
 - ii) Predict the products of the following reactions



- 7) Explain the following reactions with mechanisms.
 - i) Claisen reaction,
 - ii) Benzoin condensation, and
 - iii) Perkin reaction
- 8)
 - i) Give evidence in favour of the E₂ mechanism.
 - ii) Explain the effect of leaving groups and solvents in the reactivity of elimination reactions.

ASSIGNMENT - 1, DEC - 2016.

M.Sc. (PREVIOUS) FIRST YEAR DEGREE

CHEMISTRY

PAPER- IV — PHYSICAL CHEMISTRY

Maximum : 30 MARKS

Answer ALL questions.

- 1) Explain the changes of entropy in the mixing of ideal gases.
 - 2) Discuss the variation of chemical potential with temperature and pressure.
 - 3) Give the differences between Alpha decay theory and Beta decay theory.
 - 4) How to find out the Miller indices from Weis indices? Explain with suitable examples.
 - 5) Write the concept and significance of Helmholtz and Gibbs free energy functions.
 - 6) Describe the free energy changes in ideal gases and chemical reaction.
 - 7) Explain the Mechanism of nuclear reaction & with suitable examples.
 - 8) Give a short notes on:
 - i) Isotopic dilution
 - ii) Schottky and Frenkel defects
-

ASSIGNMENT - 2, DEC - 2016.

M.Sc. (PREVIOUS) FIRST YEAR DEGREE

CHEMISTRY

PAPER- IV — PHYSICAL CHEMISTRY

Maximum : 30 MARKS

Answer ALL questions.

- 1) Define Liquid Junction potential and deduce the equation for Liquid Junction potential.
 - 2) Give a short notes on Micelles and reverse Micelles.
 - 3) What is reaction rate? Explain how temperature effect the reaction rates.
 - 4) Define Quantum yield and explain why HCl shows high quantum yield and HBR shows low quantum yield.
 - 5) Derive an equation for EMF of cell without transfer of concentration.
 - 6) Deduce the BET equation.
 - 7) Derive the rate laws of H_2-Br_2 .
 - 8) Explain about:
 - i) Photo sensitization.
 - ii) Inter System Crossing.
-