

Shree M. P. Shah Arts and Science College, Surendranagar

Chemistry-501 - Assignment-1 B.Sc. Sem-5 - 2019/20

Q:1 Answer the following questions in short. Each carries 02 marks.

- 1 Define operator.
- 2 What is CFSE? Give the equation to calculate CFSE in octahedral and tetrahedral field.
- 3 Explain the term Doubly bridging CO group.

Q:2 Answer the following questions in brief. Each carries 03 marks.

- 1 Explain Laplacian operator.
- 2 Give CFSE value for d^4 , d^5 , d^6 , d^9 and d^{10} for strong and weak ligand field in octahedral field.
- 3 Prove that $Ni(CO)_4$, $Fe(CO)_5$ and $Cr(CO)_6$ follow 18-electron rule.

Q:3 Answer the following questions in detail. Each carries 05 marks.

- 1 What is zero point energy? Give the equation for one dimensional and three dimensional system, also explain terms involved in it.
- 2 Discuss the splitting of d-orbital in octahedral field.
- 3 Discuss chemical properties of metal complex.

Date of Submission: 01/08/2019

Shree M. P. Shah Arts and Science College, Surendranagar

Chemistry-501 - Assignment-2 B.Sc. Sem-5 - 2019/20

Q:1 Answer the following questions in short. Each carries 02 marks.

- 1 Define setting and hardening of cement.
- 2 Write the elements acting as primary and secondary plant nutrients.
- 3 Define photosensitive glass.

Q:2 Answer the following questions in brief. Each carries 03 marks.

- 1 Describe the difference between dry and wet process of cement.
- 2 Explain the action of urea as fertilizer.
- 3 Give constitution, property and use of borosilicate glass.

Q:3 Answer the following questions in detail. Each carries 05 marks.

- 1 Explain manufacturing process of Portland cement with reaction.
- 2 Discuss the production of NPK fertilizers with flow chart.
- 3 Explain manufacturing process of glass.

Date of Submission: 09/08/2019

Shree M. P. Shah Arts and Science College, Surendranagar

Chemistry-501 - Assignment-3 B.Sc. Sem-5 - 2019/20

Q:1 Answer the following questions in short. Each carries 02 marks.

- 1 Define linear operator.
- 2 Define pairing energy.
- 3 Give any one reaction for the preparation of $\text{Ni}(\text{CO})_4$ and draw its molecular structure.

Q:2 Answer the following questions in brief. Each carries 03 marks.

- 1 Explain Hamiltonian operator.
- 2 Explain the strength of ligands.
- 3 Give the reaction for preparation of $\text{Fe}_3(\text{CO})_{12}$ and draw its molecular structure.

Q:3 Answer the following questions in detail. Each carries 05 marks.

- 1 Derive the equation for particle moving in one dimensional box.
- 2 Discuss the factors affecting splitting energy.
- 3 Give classification of all type of NO ligands.

Date of Submission: 21/08/2019

Shree M. P. Shah Arts and Science College, Surendranagar

Chemistry-501 - Assignment-4 B.Sc. Sem-5 - 2019/20

Q:1 Answer the following questions in short. Each carries 02 marks.

- 1 What is soundness of cement?
- 2 Explain the role of primary element in plant growth.
- 3 Define photochromic glass.

Q:2 Answer the following questions in brief. Each carries 03 marks.

- 1 Explain the role of gypsum in cement.
- 2 Explain nomenclature of fertilizers.
- 3 Give constitution, property and use of lead glass.

Q:3 Answer the following questions in detail. Each carries 05 marks.

- 1 Explain properties of cement.
- 2 Explain triple super phosphates manufacturing process with flow diagram.
- 3 Write a note on pyrex glass, rare earth glass and insulating glass.

Date of Submission: 14/09/2019

Shree M. P. Shah Arts and Science College, Surendranagar

Chemistry-502 - Assignment-1 B.Sc. Sem-5 - 2019/20

Q:1 Answer the following questions in short. Each carries 02 marks.

- 1 Write down reaction of triphenylphosphine with oxygen and reaction of LiAlH_4 with water.
- 2 Write down any one reaction for synthesis of 2-aminothiazole and thiazine each.
- 3 Explain constitution of D-Glucose.
- 4 Write structure of Dulcin and Saccharine.

Q:2 Answer the following questions in brief. Each carries 03 marks.

- 1 Write down synthesis of 2,4-diphenyl imidazole and Iso-oxazole.
- 2 Give mechanism of the following synthesis.

- 3 Discuss epimerization.
- 4 Give synthesis of Atenolol and Chrysonine-G

Q:3 Answer the following questions in detail. Each carries 05 marks.

- 1 Discuss Bischler Napierski reaction with mechanism.
- 2 Write down synthesis of pyrazole using Pechmann synthesis and Knorr synthesis.
- 3 Explain Step-up reaction and mutarotation.
- 4 Write uses and synthesis of Saccharine and Auramine-O.

Date of Submission: 01/08/2019

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Chemistry-502 - Assignment-2 B.Sc. Sem-5 - 2019/20

Q:1 Answer the following questions in short. Each carries 02 marks.

- 1 Give names of symmetry elements.
- 2 Explain Zeisel's method to estimate $-\text{OCH}_3$ group in alkaloids.
- 3 Explain chromophore.
- 4 Explain H-bond.

Q:2 Answer the following questions in brief. Each carries 03 marks.

- 1 Construct multiplication table for C_{2h} point group
- 2 Prove that Conine contains normal propyl side chain.
- 3 Explain shifts in UV-Spectroscopy.
- 4 Write a short note on finger print region.

Q:3 Answer the following questions in detail. Each carries 05 marks.

- 1 Construct multiplication table for C_{3v} point group
- 2 Prove the constitution of Papaverine analytically.
- 3 Explain types of electronic transition.
- 4 Discuss Instrumentation of IR.

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Chemistry-502 - Assignment-3 B.Sc. Sem-5 - 2019/20

Q:1 Answer the following questions in short. Each carries 02 marks.

- 1 Give reaction for preparation of Wittig reagent from triphenylphosphine.
- 2 Give any two reactions for synthesis of dioxane.
- 3 Explain constitution of D-Glucose.
- 4 Explain symmetry elements C_n and i .

Q:2 Answer the following questions in brief. Each carries 03 marks.

- 1 Write down only mechanism of Wolf Kishner reduction.
- 2 Give reaction and synthesis of 3,6-dihydroxy pyridazine.
- 3 Discuss reaction of carbohydrates with hydroxyl amine, HCN and phenyl hydrazine..
- 4 Give synthesis of p-anisyl urea and adrenaline.

Q:3 Answer the following questions in detail. Each carries 05 marks.

- 1 Explain Curtius rearrangement in detail.
- 2 Give any two reactions and mechanism for synthesis of pyrimidine.
- 3 Discuss configuration of D-Glucose.
- 4 Give difference between σ_h , σ_v & σ_d point groups.

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Chemistry-502 - Assignment-4 B.Sc. Sem-5 - 2019/20

Q:1 Answer the following questions in short. Each carries 02 marks.

- 1 Give uses of Atenolol and Orange-II.
- 2 Define alkaloids and give their classification according to their chemical nature.
- 3 Explain Auxochrome.
- 4 What are coupled vibrations?

Q:2 Answer the following questions in brief. Each carries 03 marks.

- 1 Construct multiplication table for C_{2V} point group
- 2 Explain Hoffman exhaustive methylation method in alkaloids.
- 3 Write a short note on Fermi resonance with suitable example.
- 4 Explain solvent effect on transitions.

Q:3 Answer the following questions in detail. Each carries 05 marks.

- 1 Write uses and synthesis of Ibuprofen and Dulcin.
- 2 Prove that Nicotine possesses α -pyridyl- β -pyrrolidine structure.
- 3 Discuss instrumentation of UV (single beam)
- 4 Distinguish following pair of compounds.
 - (a) Propanal and Propanone
 - (b) Ethylbenzene and p-Xylene

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Chemistry-503 - Assignment-1 B.Sc. Sem-5 - 2019/20

Q:1 Answer the following questions in short. Each carries 02 marks.

- 1 Write limitations of 1st law of thermodynamics.
- 2 Write conventional sign and representation of an electrochemical cell.
- 3 What is called Tie line and binodal curve.
- 4 Define Gibbs free energy and Halmoltz work function.

Q:2 Answer the following questions in brief. Each carries 03 marks.

- 1 Write different statements of 2nd law of thermodynamics.
- 2 Explain Calomel electrode in detail.
- 3 Write applications of ternary liquid phase diagram.
- 4 Derive Gibbs Halmoltz equation.

Q:3 Answer the following questions in detail. Each carries 05 marks.

- 1 Write and explain Carnot theorem (Carnot Cycle).
- 2 Explain standard hydrogen electrode and glass electrode.
- 3 Discuss the ternary system for one pair of partial miscible liquids with phase diagram.
- 4 Derive Vant Hoff isotherm equation.

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Shree M. P. Shah Arts and Science College, Surendranagar

Chemistry-503 - Assignment-2 B.Sc. Sem-5 - 2019/20

Q:1 Answer the following questions in short. Each carries 02 marks.

- 1 Define Entropy.
- 2 Define electrode and standard half cell.
- 3 What is phase rule? Explain terms involved in it.
- 4 Write and derive equation for chemical affinity.

Q:2 Answer the following questions in brief. Each carries 03 marks.

- 1 Write physical significance of entropy.
- 2 What is called reversible electrode? Explain types of electrode.
- 3 Explain method of graphical representation for three component system.
- 4 Derive Clasius Clapeyron equation.

Q:3 Answer the following questions in detail. Each carries 05 marks.

- 1 Derive an equation to determine the entropy change in mixture of ideal gases

OR

Prove that $\Delta S_{\text{mix}} = -R \sum n_m \ln X_m$

- 2 Describe Galvanic cell in detail.
- 3 Discuss the ternary system of water, phenol and aniline with phase diagram.
- 4 Derive the law of mass action using 2nd law of thermodynamics.

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Chemistry-503 - Assignment-3 B.Sc. Sem-5 - 2019/20

Q:1 Answer the following questions in short. Each carries 02 marks.

- 1 What is called photochemical reaction ?
- 2 Give method for preparation of standard EDTA solution.
- 3 Discuss effect of dilution on different conductance.
- 4 Explain primary and secondary standard.

Q:2 Answer the following questions in brief. Each carries 03 marks.

- 1 Discuss deviation from Lambert-Beer law.
- 2 Explain direct titration and back titration with suitable examples.
- 3 Write Kohlraush law and platinization of electrode.
- 4 What is called iodometry and iodimetry estimation? Explain iodometry estimation.

Q:3 Answer the following questions in detail. Each carries 05 marks.

- 1 Explain spectrophotometric estimation in detail.
- 2 Explain (1) EBT (2) Solochrome black T (3) Muroxide
- 3 Discuss conductometric titration of mixture of strong acid + weak acid with strong base and titration of salt of weak base with strong base.
- 4 Explain principle of redox indicators and write a note on internal redox indicator and external redox indicator.

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Chemistry-503 - Assignment-4 B.Sc. Sem-5 - 2019/20

Q:1 Answer the following questions in short. Each carries 02 marks.

- 1 Write Grothus Draper law in detail.
- 2 Explain Velchar law for EDTA titration.
- 3 Give definition of specific conductance and molar conductance.
- 4 Define molarity and formality.

Q:2 Answer the following questions in brief. Each carries 03 marks.

- 1 Write and explain Lambert's law.
- 2 Explain alkalimetry and replacement titration with suitable example.
- 3 Explain conductometric titration of strong acid and weak base.
- 4 Explain external and external indicator.

Q:3 Answer the following questions in detail. Each carries 05 marks.

- 1 Explain spectrophotometric estimation of
(a) Lacking of absorption of radiation by reactants and product and
(2) Lacking of absorpance by reaction product.
- 2 Explain EDTA titration curve, masking and demasking.
- 3 Explain precipitation titration using conductometry.
- 4 What is called precipitation titration? Explain Fajan's adsorption method.

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