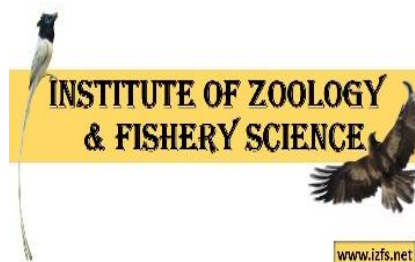




# Dr. Niraj Kumar

(Double Gold Medalist)

B.Ed., M.Sc., LL.B., Ph.D., FIAES  
MZSI, MISZS, MISCA, MBNHS, MIRCS



## MODEL QUESTIONS FOR BACHELOR OF SCIENCE PART 2 2018 EXAMINATIONS (BABASAHEB BHIMRAO AMBEDKAR BIHAR UNIVERSITY, MUZAFFARPUR)

### CHEMISTRY SUBSIDIARY FOR B.Sc. PART 2 EXAMINATION 2018

#### PAPER 2

##### GROUP – A

1. First law of Thermodynamics.
2. Hess's Law
3. Ostwald's Dilution Law
4. Kohlrausch's Law
5. Gibbs free energy.
6. Derivate an expression for the rate constant of a first order reaction. Show that half-life period of a first order reaction is independent of initial concentration.
7. Explains the terms involved in the Phase Rule.
8. Define  $C_p$  and  $C_v$ .
9. Buffer Solution and its mechanism of action.
10. Transportation Number and its determination.
11. Enthalpy of neutralization.
12. Differentiate: (a) Threshold energy & Activation Energy (b) Isothermal & Adiabatic Process.

##### GROUP – B

1. What is high spin and low spin complexes?
2. What is primary and secondary valency? Explain.
3. How does complex compound differ from double salt? Explain with suitable examples?
4. Write the magnetic properties & complex formation properties of *d-block elements*.
5. Write the electronic configuration of  $Fe^{2+}$  and  $Cr^{3+}$  ion.
6.  $K_3[Fe(CN)_6]$  is an inner orbital complex while  $K_3[FeF_6]$  is an outer orbital complex. Why?
7.  $CN^-$  is a stronger ligand than  $F^-$  while  $F^-$  is a stronger ligand than  $NH_3$ . Explain.
8. Sedgwick-Powel theory of complexes.
9. Short Notes:
  - (a) Isotope exchange reaction
  - (b) Group Displacement Law
  - (c) Uses of EDTA in volumetric estimation of metal ion
  - (d) Magic Number
  - (e) Nuclear fission & Nuclear Fusion
  - (f) Application of Oxidation Potential Diagrams
  - (g) Packing Fraction
  - (h) Nuclear Binding Energy
  - (i) Mass defect & Binding Energy
  - (j) Isotope, Isobar & Isotone.

##### GROUP – C

1. Describe the method of preparation & synthetic application of Diethyl Malonate.
2. Isolation, synthesis & properties of Citric acid.
3. What are active methylene compounds? Give suitable examples.
4. Conversion of glucose into fructose and vice-versa.
5. Draw open and closed chain of Fructose.
6. Explain mutarotation.
7. Short Notes:
  - (a) Friedel-Craft Reaction
  - (b) Aromacity
  - (c) Keto-enol tautomerism
  - (d) Free Radicals
  - (e) Heterocyclic fission
  - (f) Huckel's  $4n + 2$  rule
8. Explain :
  - (a) Carbocation & Carbanion
  - (b) Homolytic and Heterolytic Fission
  - (c) Nucleophiles & Electrophiles
  - (d)  $SN_1$  and  $SN_2$  reaction
  - (e)  $E_1$  and  $E_2$  Mechanism