

# IMPORTANT QUESTIONS FOR PU - 2 EXAM CHEMISTRY

**Setting of question papers;-**

by  
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**Paper which contains four parts -A,B,C,D(IV) and (V)**

## **PART-A**

**I. Answer all the following questions. Each question carries ONE marks**

1. Solutions
2. Solutions
3. Electrochemistry
4. Chemical kinetics
5. Surface Chemistry
6. Metallurgy
7. Group 18 elements (Nobel gases)
8. Halo alkanes and haloarenes
9. Aldehydes, ketones and carboxylic acids
10. Biomolecules

## **PART-B**

**II. Answer any Five of the following. Each question carries TWO marks**

**Any 5 needs to be attempted (Try to attend question 11,13,14,17,18 as they are easier)**

**11<sup>th</sup>. Question from Solid state:**

- Differences between Schottky and frenkel defect
- Calculate no of particles or atoms in SC, BCC, FCC
- Differences between Crystalline and amorphous solids
- Differences between n-type and p-type semiconductor
  
- What are para, dia, ferro magnetic substances? With an example
  
- How many tetrahedral and Octahedral voids in closed packed spheres.

**12<sup>th</sup>. Question from Electrochemistry**

**(There are many important questions so cannot be expected easily. But these are most probable questions)**

- Write the reactions at cathode and anode of Hydrogen oxygen cell
- Faradays first and second law with equation and problems on first law
  
- Kohlrausch Law
- Molar conductivity and expression related to specific conductivity
- Corrosion: Definition, Prevention and equations
- SHE: Cell representation, reaction, EMF, Diagram

**13<sup>th</sup>. Question from Chemical kinetics:**

- Differences b/w order and molecularity
- Define Pseudo first order reaction with an example
- Graph for effect of catalyst
- Energy distribution curve graph
- Temperature co-efficient
- Arrhenius equation with explain symbols
  
- Show that Half-life is independent of initial concentration (Derivation of half-life for first order)
- Show that Half-life is dependent of initial concentration.
- Graphs for first and zero order and units
- Units for first second and zero order reactions

**14<sup>th</sup>. Question from d & f block (only f-block elements)**

- What is Lanthanoid contraction? Why is it caused? Write any two consequences
- What is Actinoid contraction? Why actinoid contraction is greater than lanthanoid contraction
- Actinoids show variable OS. Why
- Ce shows +4 OS. Give reason
- Any two diff b/w Lanthanoids and Actinoids
- Stable OS of Lanthanoid and Actinoid

**15<sup>th</sup>. Question for Alcohols, Phenols and Ethers:**

- Williamson Ether Synthesis With eqn
- Reactions of Anisole (Bromination, Nitration, Friedal craft alkylation and acylation)
- How to convert Ethanol to Ether with Eqn

- Give reasons on properties of ether
- Kolbe reaction
- Riemer timmenn reaction

### 16<sup>th</sup>. Question from Aldehyde, ketone, carboxylic acids

(There are many important questions so cannot be expected easily. But these are most probable questions):

- How to convert Benzoic acid to benzamide
- How does Grignard reagent react with CO<sub>2</sub>
- Decarboxylation reaction
- Rosenmond, Gattermann Koch, Aldol condensation, Cannizzaro reactions

**17<sup>th</sup>.Chemistry in everyday life Chapter** (Simple definition or example will be asked)

**18<sup>th</sup>.Chemistry in everyday life Chapter** (may be)

- What are Artificial sweetening agents? Give an example
- What are Food preservatives? Give an example

## PART-C

**III. Answer any Five of the following. Each question carries THREE marks**  
(Try to attend question 19, 20, 24, 25, 26, as they are easier and FIX questions)

### 19<sup>th</sup>. Question for Metallurgy:

- Extraction of Aluminium ( Leaching (Eqn and explanations) and Hall heroult process (Diagram, Cathode Anode reaction, Overall reaction, Function of cryolite) (very very important)
- Extraction of Blister copper (One line explanation and 4Equations)
- Extraction of Iron (Diagram and reaction of different zones)
- Zone refining principle and explanation with example.
- Mond process(Nickel) and Van arkel process(Zirconium and Titanium) With equations

**20<sup>th</sup>. Group 15 Elements Question:**

- Ammonia by Haber's process (Flow chart, Reaction, Optimum conditions) (Very Important compulsory question)
- Nitric acid by Ostwald process (Very Important compulsory question)
- Reasons and Properties of Anomalous behaviour of Nitrogen

**21<sup>st</sup>. Group 16 Elements Question:**

- Preparation of Sulphuric acid by Contact process (Very Important question)
- How to prepare Ozonized Oxygen (Very important)
- Reasons and Properties of Anomalous behaviour of Oxygen.
- Structures of Oxoacids of Sulphur,  $H_2S_2O_7$ ,  $H_2SO_5$ , etc...

**22<sup>nd</sup>. Group 17 Elements Question:**

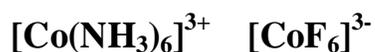
- Preparation of Chlorine by Deacon process
- Mostly Fill in the blanks and Give reasons comes in this questions
- What are Interhalogen compound and Interhalogen compounds are more reactive than Halogen compounds
- Reasons and Properties of Anomalous behaviour of fluorine.
- Bleaching powder preparation and action of it

**23<sup>rd</sup>. Question from d-block elements:**

- Give reason will be asked on any one property of d-block elements.
  1. Colour (Very important)
  2. Magnetic property (Spin only Magnetic moment calculation)
  3. Catalyst (Very important)
  4. Interstitial compounds and one example (Very important)
  5. Variable oxidation states
  6. General properties (Size, Ionization energy)

**24<sup>th</sup>. Any one preparation will be asked. (Compulsory question)**

- Preparation of Potassium dichromate from chromite ore
- Preparation of Potassium permanganate from pyrolusite ore

**25<sup>th</sup>. Any one VBT will be asked. (Co-ordination compounds)**

**26<sup>th</sup>. Question from Co-ordination Compounds :**

- Drawing of cis-trans isomers(Given in textbooks)
- Homoleptic and heteroleptic complexes with examples
- Linkage, Co-ordination, Ionisation, Solvate isomerism with one example
- Werner theory of Co-ordination complexes
- Drawing of Crystal field splitting in octahedral and tetrahedral complexes.

**PART-D(IV)****IV. Answer any Three of the following. Each question carries FIVE marks****27<sup>th</sup>. Question from Solid state**

- a) Packing efficiency of Simple cube(Primitive cube), Body centered cube, face centred cube. **(Compulsory question)**
- b) Study the questions which are mentioned for Question no 11. Mostly those will only come (2Marks)

**28<sup>th</sup>. Question from Solutions**

- a) Any one problem on  $M_2$ (Molar mass of solute) will come from chapter There are only 4 formulae from which the problems can come. Solve and go Example 2.6, 2.8, 2.10, 2.11 from PU Text book
- b) 2Marks:
1. Reverse osmosis and its applications
  2. Henry's law and mathematical expression
  3. Differences between Ideal and Non ideal solution
  4. Significance of Van't hoff factor and formula for it
  5. Raoult's law of dilute solution
  6. Azeotropic mixtures with an example
  7. Isotonic solutions with example
  8. Molarity, Molality mole fraction with formulae.

**29<sup>th</sup>. Question from Electrochemistry:****(This question is quite difficult to attend so it is a personal choice)**

- a) Numerical problem on  $E^{\circ}, \Delta G$  (3Marks)  
 b) Study the topics which are mentioned for Question no 12. (2Marks)

**30<sup>th</sup>. Question from Chemical kinetics**

- a) Derive an Integrated rate expression for rate constant of First order and zero order reaction **(Compulsory Question)**  
 b) Study the questions which are mentioned for Question no 13. Mostly those will only come (2Marks)

**31<sup>st</sup>. Question from Surface chemistry: (2+2+1)**

Differences b/w Physical adsorption and Chemical adsorption (V. IMP)

Differences b/w Lyophilic and Lyophobic colloids (V. IMP)

Differences b/w Homogenous and Heterogenous catalysis (V. IMP)

Brownian motion and cause for it, Tyndall effect (definition),

Electrophoresis with diagram

Freundlich adsorption isotherm equation

- Shape Selective Catalysis and example
- Characteristics of Enzyme catalysis (3Points)
- Mechanism of enzyme catalysis (2Equations and simple explanation)
- Bredig's electric arc method (One diagram and explain)
- Peptization (definition) and coagulation (definition and methods)
- Associated colloid with example.
- Emulsion (Definition) and example for O/W and W/O emulsions

**PART-D(IV)**

**V. Answer any Four of the following. Each question carries FIVE marks**  
**(Any 4 needs to be attempted (Try to attend 4 questions among 32, 33, 36, 37, 35 as they are easier and more predictable))**

**32<sup>nd</sup>. Question from Haloalkanes and Haloarenes:**

(In this question one mechanism and one give reason or named reaction and complete the reaction or identify the reaction will be asked) (2+2+1)

- SN<sup>1</sup> mechanism, SN<sup>2</sup> Mechanism **(one is fix)**
- Zaitsev rule and example of 2-bromopentane
- Swart's reaction, Finkelstein reaction, Reaction of Alcohol with Thionyl chloride, Reaction of haloalkanes with alc. AgCN
- Wurtz Fittig and Fittig reaction
- Chiral carbon, Enantiomers, Racemic mixture, racemisation ( Definition)
- Why Aryl halides are less reactive for nucleophilic substitution reaction
- Friedel craft reactions of chlorobenzene
- What is Grignard reagent and its formula
- What are freons?

**33. Question from Alcohols, Phenols, Ethers: (3+2)**

- Write the mechanism of conversion of ethanol to ethane **(fix question)**
- Lucas reagent and its test
- Kolbe reaction, Reactions of phenol with a) Excess Bromine water b) Bromine in CS<sub>2</sub> c) Picric acid d) Nitration e) Chromic acid d) Zinc dust
- Why phenols are more acidic in nature
- Cumene process, Conversion of BDC to Phenol
- Esterification reaction
- Acidity of Phenols and alcohols
- Reaction of alcohol with preheated Cu
- Examples for dihydric, trihydric alcohols and phenols

**34<sup>th</sup>. Question from aldehydes, ketones and carboxylic acids:**

Write the mechanism of Addition of HCN to Carbonyl compound

Rosenmond, Gattermann Koch, Aldol condensation, Cannizzaro reactions, Stephen reaction, Etard reaction with name of their reagents.

Clemmenson and Wolf kishner reduction

How to convert toluene and propyl benzene to benzoic acid

How to convert Benzoic acid to benzamide

How does Grignard reagent react with CO<sub>2</sub>

Decarboxylation reaction

**35<sup>th</sup>. Question from Amines: (2+2+1)**

- Hoffmann Bromamide degradation reaction and Carbylamine test **(one is Fix)**
- Hinsberg reagent and its reactivity with amines (NO Eqn expected)
- Reaction of Amines with nitrous acid (Aliphatic and aromatic)
- Diazotization reaction (Will be asked in fill in the blanks type also)
- IUPAC of amines (very important)
- Basicity of amines in gas and aqueous phase (Give reasons will be asked)
- Gabriel phthalamide synthesis, Reaction of aniline with Bromine water and Sulphonation of aniline
- Azo dye test (OR) coupling reaction of BDC with phenol and aniline (Will be asked in fill in the blanks type also)
- Sandmeyer reaction and reduction of Nitrobenzene to amines (Fill in the blanks type might be expected)

**36<sup>th</sup>. Question from Biomolecules:****(2+2+1)**

- Haworth structure of Sucrose, Maltose, Lactose **( One is fix)**
  - What is Peptide bond and How it is formed? Write the structure of glycylalanine.
  - Zwitter ion and Write the structure of Zwitter ion of glycine and alanine
  - What are essential and non essential amino acids?
  - Reducing and non reducing sugar with examples
  - What is denaturation of proteins? Give one example.
- Name the structure which remains intact and gets disturbed during denaturation of proteins.
- Write any two differences b/w Fibrous and Globular proteins.
  - Name the components of DNA and RNA

**One marks questions:**

Give an example for reducing sugar	Glucose
Given an example for non reducing sugar	Sucrose
Give an example for essential amino acid	Valine, Leucine, Lysine
Give an example for non essential amino acid	Glycine
Nitrogen base present only in DNA not in RNA	Thymine
Nitrogen base present only in RNA not in DNA	Uracil
Water Soluble component of Starch	Amylose
Water insoluble component of Starch	Amylopectin
Water soluble Vitamin	Vitamin B, C
Fat soluble Vitamin	Vitamin A, D, E, K
Deficiency of Vitamin A causes	Night blindness
Deficiency of Vitamin C (Ascorbic acid) causes	Scurvy
Deficiency of Vitamin B causes	Beri Beri
Deficiency of Vitamin D causes	Rickets
Deficiency of Vitamin B <sub>12</sub> causes	Pernicious anemia
Name the hormone which maintains blood sugar level in body	Insulin
Name the protein present in hair	Keratin
Name an Optically inactive amino acid	Gly

**37<sup>th</sup>.Question from Polymers: (Must be attended as it is very easy) (2+2+1)**

How Buna-N and Buna-S prepared? Write the equation

How is Nylon-6,6 prepared? Write the equation

how is Neoprene or Synthetic rubber prepared? Write the equation

what is Addition and Condensation Polymerisation? Give an example

what are Homopolymers? Give an example, what are co-polymers? Give an example

what are thermoplastics? Give an example

what are thermosetting plastics? Give an example ,what is Vulcanization?

What are biodegradable polymers? Give an example

what are non biodegradable polymers? Give an example

Write the partial structure of (Polymer structure) (Just remember the last structure of the equation, no need to practice separately)

1. Natural rubber 2. Synthetic rubber/ Neoprene 3. Nylon-6,6,

4. Buna-N 5. Buna-S. 6. Nylon-6

**One mark questions:**

Polymer	Monomer unit
Polyethene	Ethene
PVC	Vinyl chloride
Polyacrylonitrile	Acrylonitrile
Teflon	Tetrafluoroethene
Nylon-6,6	Adipic acid+Hexamethylene diamine
Nylon-6	Caprolactum
Terlyene(Dacron)	Ethylene glycol+Terephthalic acid
Bakelite	Phenol+Formaldehyde
Buna-N	1,3-butadiene+Acrylonitrile
Buna-S	1,3-butadiene+Styrene
Natural rubber	Isoprene
Synthetic rubber/Neoprene	Chloroprene

**VERY VERY MOST IMPORTANT QUESTIONS**

- Packing efficiency of Simple cube(Primitive cube), Body centered cube, face centred cube.
- Derive an Integrated rate expression for rate constant of First order and zero order reaction
- Ammonia by Haber's process (Flow chart, Reaction, Optimum conditions))
- Nitric acid by Ostwald process (Only correct 3Equations))
- Preparation of Sulphuric acid by Contact process (4Equations and Optimum conditions)
- How to prepare Ozonized Oxygen
- Preparation of Potassium dichromate from chromite ore
- Preparation of Potassium permanganate from pyrolusite ore
- Any one VBT will be asked. (Co-ordination chemistry)
- SN<sup>1</sup> mechanism, SN<sup>2</sup> Mechanism, Zaitsev rule and example of 2-bromopentane
- Write the mechanism of conversion of ethanol to ethane
- Write the mechanism of Addition of HCN to Carbonyl compound
- Hoffmann Bromamide degradation reaction and Carbylamine test
- How Buna-N and Buna-S, Nylon-6,6 prepared? Write the equation