S P

ALL 3, 5 & 10 FREQUENTLY ASKED QUESTIONS

CHEMISTRY

UNITY

HARD WORK SUCCESS

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S.No	Lessons	Part-I (MCQ) 1 Marks	Part-II (VSA) 3 Marks	Part-III (SA) 5 Marks	Part-IV (E/LA) 10 Marks	Total Marks
1	Atomic Structure-II	2	1	1	-	10
2	Periodic Classification-II	1	1	-	½	9
3	p-Block Elements	1	2	-	½	12
4	d-Block Elements	2	2	1	½(S)	18
5	f-Block Elements	2	-	1	-	7
6	Co-Ordination and Bio-Coordination Compounds	1	-	1	½	11
7	Nuclear Chemistry	1	1	-	½	9
8	Solid State-II	1	1	-	½	9
9	Thermodynamics-II	2	1	1	-	10
10	Chemical Equilibrium-II	2	1	1	-	10
11	Chemical Kinetics-II	1	2	1	-	12
12	Surface Chemistry	3	1	-	½	11
13	Electro Chemistry-I	1	1	-	½ + ½(S)	14
14	Electro Chemistry-II	-	-	1	½	10
15	Isomerism In Organic Chemistry	-	1	-	½	8
16	Hydroxy Derivatives	1	2	-	½(S)	12
17	Ethers	2	-	1	-	7
18	Carbonyl Compounds	1	1	1	½(S)	14
19	Carboxylic Acids	1	1	1	½	14
20	Organic Nitrogen Compounds	3	1	-	½	11
21	Bio Molecules	2	-	-	½	7
22	Chemistry in Action	-	1	1	-	8
	Total Marks(Including Options)	**30**	**21**	**12**	**7**	**233**
	Total Marks(To Be Answered)	**30**	**15**	**7**	**3**	**150**

Note:

Either Or Type/Long Answer (E/LA)
Short Answers(SA)
Very Short Answers (VSA)
Multiple Choice Question (MCQ)
Compulsory Sum(S)

XII CHEMISTRY BLUE PRINT AS PER QUESTION

S.No	Lessons	Part-I	Part-II	Part-III	Part-IV	Part-IV
		1 Marks	3 Marks	5 Marks	10 Marks	10 Marks Compulsory Sums
Inorganic Chemistry Section-A						
1	Atomic Structure-II	1,2	31	52	-	
2	Periodic Classification-II	3	32	-	64(a)	
3	p-Block Elements	4	33,34	-	*64(b)*	
4	d-Block Elements	5,6	35,36	53	-	70(b)
5	f-Block Elements	7,8		54	-	
6	Co-Ordination and Bio-Coordination Compounds	9	-	55	65(a)	
7	Nuclear Chemistry	10	37	-	65(b)	
	Physical Chemistry Section-B					
8	Solid State-II	11	38	-	66(a)	
9	Thermodynamics-II	12,13	39	56	-	
10	Chemical Equilibrium-II	14,15	40	57	-	
11	Chemical Kinetics-II	16	41,42	58	-	
12	Surface Chemistry	17,18,19	43	-	66(b)	
13	Electro Chemistry-I	20	44	-	67(a)	70(d)
14	Electro Chemistry-II	-	-	59	67(b)	
Organic Chemistry Section-C						
15	Isomerism In Organic Chemistry	-	45	-	68(a)	
16	Hydroxy Derivatives	21	46,47	-	-	70(a)
17	Ethers	22,23	-	60	-	
18	Carbonyl Compounds	24	48	61	-	70(c)
19	Carboxylic Acids	25	49	62	68(b)	
20	Organic Nitrogen Compounds	26,27,28	50	-	69(a)	
21	Bio Molecules	29,30	-	-	69(b)	
22	Chemistry in Action	-	51	63	-	
Other Problems & Mechanisms						
S.No	**Division**	**Inorganic**	**Physical**	**Organic**		
1	Part-I(May be Asked)	1(1,3,6,7)	2(8,9,10,11,14)	1(17,19,20)		
2	Part-II	1(1,3,6,7)	1(8,9,10,11,14)	1(17,19,20)		
3	Part-III	Section-A (1)	Section-B (1)	Section-c (1 Mechanism)		
4	Part-IV (May be Asked)	-	-	68 Or 69 (Mechanism)		
Total Marks Given For Problems= 4+9+10+20						

PERIODIC TABLE of the ELEMENTS

DMITRI MENDELEYEV (1834 - 1907)

The Russian chemist, Dmitri Mendeleyev, was the first to observe that if elements were listed in order of atomic mass, they showed regular (periodical) repeating properties. He formulated his discovery in a periodic table of elements, now regarded as the backbone of modern chemistry.

The crowning achievement of Mendeleyev's periodic table lay in his prophecy of then, undiscovered elements. In 1869, the year he published his periodic classification, the elements gallium, germanium and scandium were unknown. Mendeleyev left spaces for them in his table and even predicted their atomic masses and other chemical properties. Six years later, gallium was discovered and his predictions were found to be accurate. Other discoveries followed and their chemical behaviour matched that predicted by Mendeleyev.

This remarkable man, the youngest in a family of 17 children, has left the scientific community with a classification system so powerful that it became the cornerstone in chemistry teaching and the prediction of new elements ever since. In 1955, element 101 was named after him: Md, Mendelevium.

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Lanthanide Series: La Ce Pr Nd Pm Sm Eu Gd Tb Dy Ho Er Tm Yb Lu

Actinide Series: Ac Th Pa U Np Pu Am Cm Bk Cf Es Fm Md No Lr

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1.ATOMIC STRUCTURE - II

3 MARKS (Q.NO:31)

1. State Heisenberg's Uncertainty principle.
2. Distinguish between a particle and a wave.
3. What are the condition for effective H2 – Bonding.
4. Why is He_2 not formed?
5. What is bond order?
6. What is the significance of negative electronic energy?
7. Define hybridization.

5 MARKS (Q.NO:52)

1. Explain the formation of oxygen molecule by Mo theory.
2. Drive de Broglie's equation.
3. Discuss Davisson and Germer's Expriment.
4. Give any five postulates of Mo theory.
5. Explain the formation of Nitrogen molecule by Mo theory.
6. The uncertainty in the position of a moving bullet of mass 10g is 10^{-5}m. Calculate the uncertainty in its velocity.
7. The wavelength of a moving body of mass 0.1mg is 3.310×10^{-29}m. Calculate its kinetic energy. [$h=6.626\times10^{-34}$J]
8. A moving electron has 4.55×10^{-25} joules of kinetic energy. Calculate its wavelength. [mass=9.1×10^{-31}kg and $h=6.626\times10^{-34}$kgm^2 s^{-1}]

2. PERIODIC CLASSIFICATION - II

3 MARKS (Q.NO:32)

1. Which is electron affinity of fluorine less than that of Chlorine?
2. Why is the first ionization energy of beryllium is greater than that of Lithium?
3. Explain why the first ionization energy of Be is greater than that of B.
4. Compare the ionization energy of nitrogen with that of oxygen.
5. If the d(C-Cl) is 1.76 Å and r(Cl) is 0.99 Å, Find the radius of carbon atom.
6. Calculate the effective nuclear charge experienced by the 4s electron in potassium atom.(S=16.8).
7. Define electron affinity.
8. Mention the disadvantage of Pauling's and Mullikan's electro negativity scale.
9. Why is ionization energy of fluorine greater than that of oxygen?
10. The electron affinities of beryllium and nitrogen are almost zero.
11. Neon has more ionization energy than fluorine. Why?
12. Calculate the electronegativity value of fluorine on Mullikan's scale from the following data: Ionization potential of F = 17.4 eV/atom Electron affinity of F = 3.62 eV/atom
13. Lager the size of the atom, lesser is the ionization energy. Explain.
14. The first ionization energy of aluminium is lower than that of magnesium. Why?

10 MARKS (Q.NO:64A)

1. Explain Pauling's method to determine ionic radii.
2. Explain the various factors that affect electron affinity.
3. How do electronegativity values help to find out the nature of bonding between atoms
4. Explain the Pauling's scale for the determination of electro negativity. Give the disadvantage of Pauling scale.
5. Explain any three factors which affect the ionization energy.
6. Explain how electronegativity values help to find out the percentage of ionic character in polar covalent bond.

3. p – BLOCK ELEMENTS

3 MARKS (Q.NO:33, 34)

1. H_3PO_4 is triprotic. Prove.
2. What is Plumbo solvency?
3. Prove that phosphorous acid is a powerful reducing agent.
4. Prove that P_2O_5 is powerful dehydrating agent.
5. Illustrate the oxidising power of fluorine.
6. Why HF cannot be stored in glass bottles?
7. Write about the Holmes's signal.
8. Give three uses of neon.
9. How is potash alum prepared?
10. Give the electronic structure of (i) H_3PO_3 and (ii) PCl_5
11. How is ortho phosphotic acid acid prepared in the laboratory?
12. What are interhalogen compound? Give the preparation of any one.
13. What is inert pair effect?
14. What happens when phosphorus acid is heated?
15. H_3PO_3 is diprotic. Why?
16. What is the action of heat on orthophosphoric acid?
17. How are Xenon fluorides prepared?

10 MARKS (Q.NO:64B)

1. How is fluorine isolated from their fluorides by Dennis method?
2. How are noble gases isolated from air?
3. Describe in detail how noble gases are isolated from air by Ramsay – Rayleigh's method.
4. Mention the uses of silicones.
5. Illustrate i) tribasic nature of orthophosphoric acid ii) Reducing property of phosphorus acid.
6. Discuss the structure of interhalogen compound AX and AX_5 type.
7. How does Fluorine differ from other halogens?
8. How is lead extracted from its ore?
9. Explain the following: i) dehydrating property of P_2O_5 ii) oxidizing power of fluorine.
10. Describe in detail how noble gases are isolated by Dewar's process.

4. d – BLOCK ELEMENTS

3 MARKS (Q.NO:35, 36)

1. Explain why Mn^{2+} is more stable than Mn^{3+} .
2. A substance is found to have a magnetic moment of 3.9 BM. How many unpaired electrons does it contain?
3. Give any two evidence for oxidizing nature of potassium dichromate.
4. Why do transition elements form complexes?
5. Why do d-block elements have variable oxidation states?
6. How is chrome–plating done?
7. Write the reaction of gold with aqua regia.
8. Explain electrolytic refining of copper.
9. What is splitting of silver and how is it prevented?
10. What is the action of heat on copper sulphate crystals?
11. What is the reaction of $CuSO_4$ with KCN?
12. What is the action of Zinc on hot NaOH solution?
13. Explain Chromyl chloride test with equation.
14. Why are Zn^{2+} salts colourless whileNi^{2+} salts are coloured?
15. Why are transition metal ions coloured?
16. What happens when KI solution is added to an aqueous solution of copper sulphate?
17. How is purple of cassius prepared?

5 MARKS (Q.NO:53)

1. Briefly explain the extraction of Zinc blende.
2. How is silver extracted from its ore?
3. How is gold extracted from its ore?
4. How is potassium dichromate prepared from chrome iron ore?
5. How is Cr_2O_3 reduced to chromium by aluminothermic process?

5. f – BLOCK ELEMENTS

5 MARKS (Q.NO:54)

1. List the similarities and difference between Lanthanides and Actinides(any five)
2. What is lanthanide contraction? Discuss its causes and any two consequences.
3. Describe the extraction of Lanthanides from monazite sand.
4. Discuss the position of lanthanides in the periodic table.
5. Mention the oxidation state and any three uses of lanthanides.
6. Mention the uses of lanthanides.
7. Write any three uses of lanthanides and actinides.
8. What are the consequences of lanthanides.

9.

6. COORDINATION COMPOUNDS AND BIO-COORDINATION COMPOUNDS

5 MARKS (Q.NO:55)

1. Write the potulates of Werner's theory on co-ordination compound.
2. $[Ni(CN)_4]^{2-}$ is diamagnetic whereas $[Ni(NH_3)_4]^{2+}$ is para magnetic. Explain.
3. For the complex $K_4[Fe(CN)_6]$ mention
   a) IUPAC Name b) Central metal ion c) Ligand d) Co-ordination number e) Geometry
4. Explain coordination and ionization isomerism with suitable example.
5. For the complex $K_4[Fe(CN)_6]$, $[Cu(NH_3)_4]\ SO_4$ mention
   a) IUPAC Name b) Central metal ion c) Ligand d) Co-ordination number e) Geometry
6. How is chlorophyll important in environmental chemistry? Mention its function.
7. In what way does $[FeF_6]^{4-}$ differ from $[Fe(CN)_6]^{4-}$?
8. For the complex $[Co(NH_3)_4\ Cl_2]NO_2$, mention the following a) IUPAC Name
   b) Central metal ion c) Ligand d) Co-ordination number e) Charge on the complex ion
9. For the complex $[Cu(NH_3)_4]\ SO_4$ mention
   a) IUPAC Name b) Central metal ion c) Ligand d) Co-ordination number e) Geometry.
10. Mention the function of hemoglobin in natural process.
11. Apply V.B. theory for $[Ni(CN)_4]^{2-}$ and $[FeF_6]^{4-}$ and explain the shape and magnetic properties.

10MARKS (Q.NO:65A)

1. Write the application of VB theory on the following complex. i) $[Fe^{II}F_6]^{4-}$ ii) $[Fe^{II}(CN)_6]^{4-}$
2. Write the postulates of Werner's theory of coordination compounds.
3. $[Ni(CN)_4]^{2-}$ is diamagnetic whereas $[Ni(NH_3)_4]^{2+}$ is paramagnetic. Explain.
4. Explain coordination and ionization isomerism with suitable examples.
5. Explain the following terms: i) Neutral ligand ii) Chelates iii) Co-ordination sphere.
6. What are the postulates of valence bond theory?
7. Explain hydrate and linkage isomerism with suitable examples.

7. NUCLEAR CHEMISTRY

3 MARKS (Q.NO:37)

1. Explain the principle behind the 'Hydrogen bomb'
2. What is the Q value of a nuclear reaction?
3. Give any three difference between chemical and nuclear reactions.
4. The atomic masses of Li, He and proton are 7.01823amu, 4.00387amu and 1.00715amu respectively. Calculate the energy evolved in the reaction. (1amu = 931 MeV)
5. The half life period of a radioactive element is 100 secs. Calculate the disintegration constant.
6. In the following radioactive decay: ${}_{92}X^{232} \rightarrow {}_{89}Y^{220}$, how many α and β particles are ejected?
7. Calculate the number of α and β particles emitted ${}_{90}Th^{232}$ nucleus is converted into ${}_{82}Pb^{208}$?
8. Half-life period of ${}_{79}Au^{198}$ nucleus is 150 days. Calculate its average life?
9. The decay constant for ${}_{6}C^{14}$ is 2.31×10^{-4} year^{-1}. Calculate half-life period.
10. How many α and β particles will be emitted by an element ${}_{84}A^{218}$ in changing to a stable isotopes of ${}_{82}B^{206}$?

11. Calculate the Q value of the following nuclear reaction: $_{13}Al^{27} + _{2}He^{4} \rightarrow _{14}Si^{30} + _{1}H^{1} + Q$
12. 140 days. Calculate the average life.
13. Calculate the decay constant for Ag^{108} if its half life is 2.31 minutes.
14. State two uses of Radio carbon dating.
15. . In the conversion of $_{92}U^{235} \rightarrow _{82}Pb^{235}$ Calculate the number of alpha and beta particles
16. Neutron bombardment fragmentation of U^{235} occurs according to the equation:

$$_{92}U^{235} + _{0}n^{1} \rightarrow _{42}Mo^{98} + _{54}X^{136} + X_{-1}e^{0} + Y_{0}n^{1}$$

10 MARKS (Q.NO:65B)

1. List the medical uses of radioactive isotopes.
2. Explain briefly about Radiocarbon dating.
3. Explain the principle underlying the function of hydrogen bomb.
4. Explain the nuclear reaction that take place in sun.
5. Explain nuclear fission reaction with an example.
6. Mention the use of radioisotopes in the field of
   i) Study of hydrolysis of ester ii) Mechanism of photosynthesis in plants
7. Difference between chemical reaction and nuclear reaction.
8. Distinguish between Nuclear Fusion reactions and Fission reactons.

8. SOLID STATE-II

3 MARKS (Q.NO:38)

1. What are superconductors?
2. What is a vitreous state?
3. Determine the number of CsCl units per unit cell. CsCl has bcc arrangement.
4. What is meant by super conducting transition temperature?
5. Write a note on molecular crystals?
6. Write a note on Frankel defect.
7. Sketch the following lattices :a) Simple cubic b) Face centred cubic c) Body centred cubic.
8. How are glasses formed?
9. Write the application of superconductors.
10. State Bragg's law
11. Write a note on the assignment of atoms per unit cell in fcc (face centred cubic)

10 MARKS (Q.NO:66A)

1. Explain Schottky and Frenkel defect.
2. Explain Bragg's spectrometer method.
3. Explain the nature of glass.
4. Write the properties of ionic crystals.
5. What are superconductors? Write their uses.

9. THERMODYNAMICS

3 MARKS (Q.NO:39)

1. What is entropy? What is its unit?
2. What is Gibbs's free energy?
3. What types of liquids or substance deviate from Trouton's rule ?
4. Give the Kelvin – Planck statement of second law of Thermodynamics.

5. State the Clausius statement of second law of Thermodynamics.
6. What is the entropy change of an engine that operates at 100^0C when 453.6 Kcal of heat is supplied to it?
7. Calculate the molar heat of vaporization of the ideal liquid CCl_4 (Boiling point of CCl_4 is 76.7^0C and $\Delta S = 87.864$J)
8. ΔH and ΔS values of a reaction at 300K are -10 Kcal mol^{-1} and 20 Cal. deg^{-1} mol^{-1} respectively. Calculate ΔG value
9. Give entropy statement of second law of thermodynamics. Mention the unit of entropy also.
10. Calculate the entropy change involved in the conversion of 1 mole of ice at 0^0 and 1 atm to liquid at 0^0 and 1 atm. The enthalpy of fusion per mole of ice is 6008 $J.mol^{-1}$.
11. State Trouton's rule.
12. Calculate the change of entropy for the process. Water (liq) to water (vapour 373K) involving $\Delta H_{vap} = 40850$J mol^{-1} at 373K.
13. How is ΔG related to ΔH and ΔS ? What is the meaning of $\Delta G = 0$?
14. Calculate the maximum efficiency % possible from a thermal engine operating between 110^0C and 25^0C
15. What is the nature of the reaction when i) $\Delta G > 0$ ii) $\Delta G < 0$ iii) $\Delta G = 0$
16. The normal boiling point of $CHCl_3$ is 61.5^0C. Calculate the molar heat of vaporization of $CHCl_3$ assuming ideal behaviors.

5MARKS (Q.NO:56)

1. State the various statement of second law of thermodynamics.
2. Write the characteristics of free energy G?
3. What are the characteristics of entropy S?

10. CHEMICAL EQUILIBRIUM-II

3MARKS (Q.NO:40)

1. The equilibrium constant K_C for $A_{(g)} \rightleftharpoons B_{(g)}$ is 2.5×10^{-2} . The rate constant of the forward reaction is 0.05 sec^{-1} . Calculate the rate constant of the reverse reaction.
2. In the equilibrium $H_2 + I_2 \rightleftharpoons 2HI$, the number of mole of H_2, I_2 and HI are 1,2,3 mole respectively. Total pressure of the reacton mixture is 60 atm. Calculate the partical pressures of H_2 and HI in the mixture.
3. Write the equilibrium constants for the following.
4. State Le Chatlier's principle.
5. What happens when $\Delta_{ng} = 0$, Δ_{ng} = -ve , Δ_{ng} = +ve in a gaseous reaction?
6. Define reaction quotient. How is related to equilibrium constant?
7. What is the relationship between formation equilibrium constant and dissociation constant? Give one example.
8. For reaction $A + B \rightleftharpoons 3C$ at 25^0C , a 3 litre volume reaction vessel contains 1, 2 and 4 moles of A, B and C respectively at equilibrium. Calculate the equilibrium constant KC of the reaction at 25^0C.
9. Dissociation of PCl_5 decreases in the presence of increase in Cl_2 . Why?
10. Dissociation equilibrium constant of HI is 2.06×10^{-2} at 458^0 C. At equilibrium, concentration of HI and I_2 are 0.36 M and 0.15 M respectively. What is the equilibrium concentration of H_2 at 458^0 C?
11. What is equilibrium constant?
12. Why do chemical equilibrium is referred to as dynamic equilibrium?

5 MARKS (Q.NO:57)

1. Derive the relation between equilibrium constant K_P and K_C .
2. Apply Le chatelier's principle for the manufacture of ammonia by Haber's process.
3. The dissociation equilibrium constant of HI 2.06 X 10^{-2} at 458 K. At equilibrium the concentration of HI and I_2 are 0.36 M and 0.15 M respectively. What is the equilibrium concentration of H_2 at 458 K?
4. Derive the expression for K_P and K_C for the decomposition of PCl_5.
5. Apply Le chatelier's principle for the manufacture of SO_3 by contact process and find the condition for getting maximum yield of SO_3 .
6. Discuss the effect of temperature and pressure on the following equilibrium :

$$N_2O_{4(g)} \rightleftharpoons 2NO_{2(g)} \quad \Delta H = +59.0 \text{ KJ/mole.}$$

7. Derive the experession for K_P and K_C for the formation of HI.

11. CHEMICAL KINETICS – II

3 MARKS (Q.NO:41, 42)

1. Give three example for opposing reactions.
2. The half-life period of a first order reacton is 20 min. Calculate the rate constant.
3. The initial rate of a first order reaction is 5.2 X 10^{-6} mol $lit^{-1}s^{-1}$ at 298 K. when the initial concentration of the reaction is 2.6 X 10^{-3} mol lit^{-1} . Calculate the first order rate constant of the reaction at the same temperature.
4. Write a brief note on consecutive reaction.
5. Show that for a first order reaction time required for 99% completion is twice the time required for 90% completion of the reaction.
6. Write the Arrhenius equation and explain the terms.
7. What are parallel reaction? Give one example.
8. Define order of reaction.
9. What are opposing reaction? Give an example.
10. What are simple and complex reaction?
11. What is activation energy?
12. What is pseudo first order reaction? Give example.
13. Derive an equation for the half – life period of a first order reaction.
14. What are complex reaction? Give an example.
15. The rate constant for a first order reaction is 1.54 X 10^{-3} sec^{-1} . Calculate its half-life period.
16. Show that the half – life period of a first order reaction is independent of the initial concentration of the reactant.

5 MARKS (Q.NO:58)

1. Write the characteristics of order of reaction.
2. Explain the experimental determination of rate constant for decomposition of H_2O_2 in aqueous solution.
3. Discuss the characteristics of a first order reaction.
4. Explain the experimental determination of rate constant of acid hydrolysis of methyl acetate.
5. State the difference between simple and complex reactions.
6. Write notes on (i) consecutive reaction, (ii) parallel reactions and (iii) opposing reactions.

7. Explain various types of complex reaction and give one example for each.
8. Compound A reacts by first order kinetic. At 25^0C. the rate constant of the reaction is 0.45 sec^{-1} . What is the half – life period of A at 25^0C ? What is the time required to have 12.5% unreacted A for first order reaction?
9. Derive an equation for the rate constant of a first order reaction.
10. A first order reaction is 75% complete in 100 minutes. What are the rate constant and half – life period of the reaction?
11. Show that for a first order reaction, the time required for 99.9% completion of the reaction is 10 times that required for 50% completion.

12. SURFACE CHEMISTRY

3 MARKS (Q.NO:43)

1. What is electrophoresis?
2. What are emulsions?
3. Write a note on auto – catalyst.
4. Why is a colloidal system of gas in gas does not exist?
5. What is catalytic poison? Give an example.
6. What is tanning?
7. What is heterogeneous catalysis? Give and example.
8. What are promoters? Give an example.
9. What is electrodialysis?
10. What is peptisation? Give an example.
11. What is Brownian movement? Give reason.
12. Give any three differences between physical adsorption and chemical adsorption.
13. What is Tyndall effect?
14. Write any three general characteristics of catalytic reaction.
15. What are lyophilic sols? Give example.

10MARKS (Q.NO:66B)

1. Write briefly the adsorption theory of catalysis?
2. How are colloids prepared by using (i)mechanical dispersion method,(ii)electro dispersion method?
3. Write briefly about the preparation of colloids by chemical methods.
4. Explain intermediate compound theory of catalysis.
5. What is electro – osmosis? Explain the experiment.
6. Give any 5 main differences between physical adsorption and chemical adsorption.
7. Write notes on a (i) Auto catalyst, (ii) Promotors.
8. How can colloidal solution be purified by dialysis?
9. Write the general characteristics of catalytic reactions.

13. ELECTRO CHEMISTRY – I

3 MARKS (Q.NO:44)

1. State Faraday's first and second laws of electrolysis.
2. State Kohlraush's law.
3. What is common ion effect? Give example.
4. The mass of the substance deposited by the passage of 10 ampere of current for 2 hours 40 minutes and 50 seconds is 9.65 g. Calculate the electrochemical equivalent.
5. Define equivalent conductance. Give the equation for it.
6. State Oswald's dilution law.
7. Define electrochemical equivalent. What is its unit?
8. What is Buffer solution? Give example.
9. Why does the metallic conductance decrease with increase in temperature?

10 MARKS (Q.NO:67A)

1. Derive Oswald's dilution law.
2. Explain Oswald's theory of indicators.
3. Derive Henderson equation.
4. Write note on Quinonoid theory of indicators.
5. Explain the postulates of Arrhenius theory of electrolytic dissociation.
6. Explain the buffer action of acidic buffer with an example.
7. What are the evidences in favour of Arrhenius theory of electrolytic dissociation?
8. Differentiate between electronic conduction and electrolytic conduction.

14. Electro Chemistry –II

5Marks (Q.No:59)

1. Calculate the emf of the Zn-Ag cell at 25^0C when Zn^{2+}=0.10M&Ag^{2+}=10M.($E^0 250^0$C =1.56V)
2. Derive Nernst equation.
3. The e. m. f of half cell Cu^{2+} (aq) | Cu(s) containing 0.01M Cu^{2+} solution is +0.301V. Calculate the standard e. m. f of the half cell.
4. Determine the standard e. m. f of the cell and standard free energy change of the cell reaction Zn, Zn^{2+} || Ni^{2+}Ni. The standard reduction potential of Zn, Zn^{2+} and Ni^{2+}Ni half cells are 0.76V and -0.25V respectively.
5. Write an account on cell terminology.
6. How is a standard Hydrogen Electrode(SHE) constructed? Explain its function.
7. Calculate the e. m. f of the cell.

Zn | Zn^{2+} (0.001M) || Ag^+ (0.1M) Ag E^0 Ag | Ag+ = +0.80V, E^0 Zn | Zn2+ = -0.76V.

8. Calculate the standard emf and standard free energy change of the following cell:

Zn | Zn^{2+} || Cu^{2+} | Cu E^0 Zn | Zn2+ = -0.762V and E^0 Cu2+ | Cu = +0.337V

9. Calculate the equilibrium constant for the following cell reaction:

$2Ag^+ + Zn \rightleftharpoons Zn^{2+} + 2Ag$ E^0 Ag+ | Ag = +0.80V, E^0 Zn2+ | Zn = -0.76V

10 MARKS (Q.NO:67B)

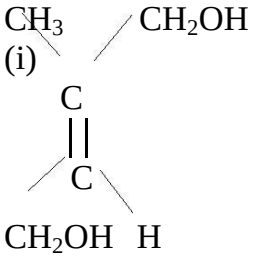
1. Write the IUPAC convention for writing cell diagram with example.
2. Write a brief account on the relation between EMF and free energy.
3. Describe Daniel cell.
4. How is e. m. f of a half cell determined?
5. Explain any five terms used in cell terminology.

15. ISOMERISM IN ORGANIC CHEMISTRY

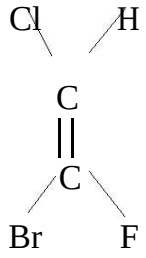
3 MARKS (Q.NO:45)

1. Label the following as E, Z isomers.

(i)

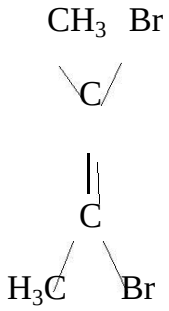


(ii)

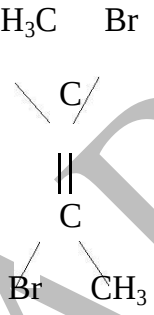


2. Give the conditions required for a compound to exhibit optical Isomerism.
3. Mesotartaric acid is an optically inactive compound with chiral carbon atom. Justify.
4. Differentiate diastereomer from enantiomer.
5. Distinguish racemic mixture from mesoform.
6. Identify Cis-Trans isomer from the following:

(i)



(ii)



7. Trans isomer is more stable than cis isomer. Why?
8. What is a racemic mixture ? Explain with a suitable example.
9. What are optical isomers? Give example.
10. Give the structure of cis – trans isomer of 2- pentene.

10 MARKS (Q.NO:68A)

1. Distinguish between enantiomers and diastereomers.
2. Discuss the optical activity in Tartaric acid.
3. Distinguish racemic form from Meso form with suitable example.
4. Describe the conformations of cyclohexanol and comment on their stability.
5. Explain internal and external compensation with suitable examples.
6. Explain geometrical (cis,trans) isomerism with example.

16. HYDROXY DERIVATIVES

3MARKS (Q.NO:46, 47)

1. How can the consumption of alcohol by a person be detected?
2. How is phenolphthalein prepared?
3. Why is glycol more viscous than ethanol?
4. Give any three uses of benzyl alcohol.
5. Write a note on coupling reaction.

6. Phenol is insoluble in $NaHCO_3$ solution but acetic acid is soluble. Give reason.
7. How does glycerol react with $KHSO_4$? (Or) How is acrolein formed?
8. How is phenol prepared by Dow's process?
9. How will you convert C_2H_5 -OH to C_2H_5-O-C_2H_5 ?
10. Write the dye test for phenol.
11. How is allyl alcohol obtained from glycerol?
12. Alcohol cannot be used as a solvent for Grignard reagents.
13. Write the conversion of ethylene glycol to 1,4 – dioxin.
14. Write a note on Kolbe's reaction.
15. How is glycerol synthesized from propylene?
16. Give a chemical test to distinguish between ethanol and methanol.
17. How is phenol identified?
18. How will you convert 2-methyl-2-propanol into 2-methyl propene?
19. What happens when ethylene reacts with cold dilute alkaline $KMnO_4$?
20. Phenol are soluble in alcohols. Why?
21. How can Terylene be prepared?
22. Starting from phenol how would you obtain picric acid?
23. How is tertiary butyl alcohol converted to isobutylene?
24. How is benzyl alcohol prepared by Grignard synthesis?
25. How is nitroglycerine prepared from glycerol?

17. ETHERS

5 MARKS (Q.NO:60)

1. How do ethers react with HI? Give the significance of the reaction.
2. Discuss the isomerism exhibited by ethers.
3. Distinguish aliphatic ether (diethyl ether) and aromatic ether(anisole).
4. How does diethyl ether react with the following reagents?
   (i) O_2/long contact (ii) dil. H_2SO_4 (iii) PCl_5
5. Give any three methods of preparing diethyl ether.
6. Give any two methods of preparation of anisole and explain the reaction of HI with anisole.
7. Give any two methods of preparation of anisole.
8. How does diethyl ether react with PCl_5. One equivalent of HI and excess of HI?

18. CARBONYL COMPOUNDS

3 MARKS (Q.NO:48)

1. Give the IUPAC names for the following:
   (i) Crotonaldehyde (ii) Methyl n-propyl ketone (iii) Phenyl acetaldehyde
2. How does HCHO react with ammonia? (Or) What is urotrophine prepared? Mention its use.
3. How can acetophenone be prepared by Friedel-Crafts reaction?
4. What is formalin? Write its use.
5. What is Rosenmund's reduction? What is the purpose of adding $BaSO_4$ in it?
6. Write two tests to identify aldehydes.
7. Explain haloform reaction with an example.
8. Write briefly on Clemmensen's reduction.

5 MARKS (Q.NO:61)

1. Explain the mechanism of Cannizzaro reaction.
2. Explain the mechanism of crossed aldol condensation.
3. Explain the mechanism of aldol condensation of acetaldehyde.
4. Write the mechanism of Claisen Schmidt reaction.
5. Write the difference between acetaldehyde and acetone.
6. Explain the mechanism of aldol condensation in acetone.
7. Explain 'Popott's rule with an example.
8. Write notes on (i) Stephen's reaction, (ii) Perkin's reaction.
9. How is acetone converted to (i) mesityl oxide (ii) mesitylene.

19. CARBOXYLIC ACIDS

3 MARKS (Q.NO:49)

1. What is trans-esterification?
2. What is meant by esterification reacton? Write the equation.
3. Write a note on HVZ reaction.
4. Mention the uses of Oxalic acid.
5. Give the source and trivial name of (i) HCOOH (ii) C_3H_7COOH (iii) $C_{11}H_{23}COOH$
6. Formic acid reduces Tollen's reagent. But acetic acid does not. Give reason.
7. What is the action of lactic acid with dil. H_2SO_4?
8. How is methyl salicylate prepared?
9. Account for the reducing nature of formic acid with suitable illustration?
10. Write two tests to identify carboxylic acids.
11. Give the tests for Salicylic acid.
12. Mention the uses of benzoic acid.
13. How is asprin prepared from salicylic acid?
14. How will you convert lactic acid into lactyl chloride.

5 MARKS (Q.NO:62)

1. How is lactic acid manufactured in large scale? How can it be converted into cyclic diester?
2. Account for the reducing nature of formic acid.
3. How is benzoic acid obtained from (a) Ethyl benzene (b) Phenyl cyanide (c) Carbon dioxide?
4. Distinguish between formic acid and acetic acid.
5. How are the following conversions carried out? (a) Lactic acid to Lactide
   (b) Succinic acid to Succinimide (c) Salicylic acid to Asprin.
6. How is Oxalic acid manufactured from sodium formate?
7. Write the mechanism of esterification reaction.
8. What happens when (i) Oxalic acid is treated with NH_3
   (ii) Benzoic acid is treated with PCl_5?
9. Bring about the following conversions: (i) Salicylic acid to Asprin (ii) Lactic acid to Lactide (iii) Benzoic acid to Benzyl alcohol.
10. Explain the mechanism of Kolbe's reaction.
11. What happens when lactic acid is (i) treated with dilute H_2SO_4 (ii) treated with PCl_5 (iii) Oxidised with acidified $KMnO_4$?

12. What happens when Lactic acid is (i) treated with dilute H_2SO_4 (ii) Oxidised with Fenton's reagent (iii) added to PCl_5?
13. Explain the reactions of CH_3CONH_2 with (i) P_2O_5 (ii) Br_2/NaoH and (iii) Hydrolysis by an acid
14. How is lactic acid synthesized from acetylene? How can it be converted into cyclic diester?
15. Give the equation for the action of heat on (a) Oxalic acid (b) Succinic acid (c) Formic acid
16. Write shorts on the following: (i) HVZ reaction (ii) Trans-esterification (iii) Kolbe's electrolytic reaction

10 MARKS (Q.NO:68B)

1. Give the mechanism involved in the esterification of carboxylic acid with alcohol.
2. How can salicylic acid be converted to (i) Asprin (ii) 2,4,6 tribromophenol (iii) Methyl salicylate?
3. Discuss the isomerism exhibited by carboxylic acid.
4. What happens when lactic acid is (i) treated with dil. H2SO4 (ii) heated alone (iii) Oxidesed with alkaline KMnO4?
5. Give the mechanism involved in bromination of salicylic acid.
6. How are the following conversion take pace? (i) Salicylic acid to Methyl salicylate (ii) Lactic acid to Pyruvic acid (iii) Methyl cyanide to Acetamide.
7. How do you distinguish formic acid from acetic acid?
8. How are the following conversions carried out? (i) Salicylic acid to Asprin (ii) Methyl acetate to Ethyl acetate (iii) Lactic acid to Pyruvic acid.
9. Account for the reducing nature of Formic acid.
10. How is benzoic acid obtained from (i) Ethyl benzene (ii) Phenyl cyanide (iii) Carbon dioxide?
11. Explain (i) Kolbe's electrolytic reaction and (ii) trans – esterification reaction.
12. How are the following conversions carried out? (i) Salicylic acid to Asprin (ii) Salicylic acid to Methyl salicylate (iii) Lactic acid to Lactide.
13. How is Oxalic acid manufactured from sodium formate?
14. How to do the following conversion? (i) Lactic acid to Lactide (ii) Salicylic acid to Methyl salicylate.
15. What happens when benzoic acid reacts with (i)Con. HNO_3/ConH_2SO_4 (ii) Cl_2/$FeCl_3$ (iii) PCl_5
16. Write the preparation of salicylic acid with mechanism.

20. ORGANIC NITROGEN COMPOUNDS

3 MARKS (Q.NO:50)

1. How will you convert acetamide to methyl amine? Give equation.
2. An Organic compound (A) having molecular formula C_2H_7N is treated with nitrous acid to give (B) molecular formula C_2H_6O which answers iodoform test. Identify (A) and (B) and explain.
3. What is Gabriel's Phthalimide synthesis?

4. Explain diazotization with a suitable example.

5. When benzamide is treated with bromine and alkali gives compound A. Also when benzamide is reduced by LiAlH4 , compound B is formed. Find A and B. Write the equations.

6. $C_6H_5CH_2NH_2 \xrightarrow{HNO} A \xrightarrow{[O]} B \xrightarrow{Zn/Hg/HCl} C$. Identify A, B, and C.

7. An aromatic primary amine A with molecular formula C_6H_7N undergoes diazotization to give B. B when treated with hypophosphorous acid gives C. Identify A, B, and C.

8. An aromatic simplest nitro compound A on reduction using Sn and HCl gives B. B undergoes carbylamines reaction. Identify A and B. Give any on use of compound A.

9. Compound A is yellow coloured liquid and it is called oil of mirbane. A on reduction with tin and HCl gives B. B answers carbylamine test. Identify A and B.

10. An organic compound (A) with molecular fomula C_6H_7N gives (B) with HNO_2/HCl at 273K. The aqueous solution of (B) on heating gives (C) which gives violet colour with neutral FeCl3. Identify the compounds A, B, and C.

11. An Organic compound A of molecular formula C_2H_5ON treated with bromine and KOH gives B of molecular formula CH_5N. Identify A and B. Write the equation involved.

12. An Organic compound A of molecular formula C_2H_5NO on treatment with Na/C_2H_5OH gives B(C_2H_7N) and with Br_2/KOH gives C (CH_5N). Identify A, B, C.

13. $CH_3NO_2 \xrightarrow{Sn/HCl} A \xrightarrow{CHCl_3/alcoholic\ KOH} B \xrightarrow{H_2/Pt} C$. Identify A, B and C.

10 MARKS (Q.NO:69A)

1. Distinguish between primary, secondary and tertiary amines.
2. How are the following conversions carried out?
   (i) Nitrobenzene to phenyl hydroxylamine (ii) Aniline to phenyl isocyanide
   (iii) Benzene diazonium chloride to biphenyl
3. Write a note on the reduction nitrobenzene under different conditions.
4. How are the following conversions carried out? (i) Nitroethane to Methyl amine
ii) Methyl amine to Methyl isocyanide ,iii) Benzene diazonium chloride to Biphenyl.
5. How are (i) phenol, (ii) Chlorobenzene,
   (iii) Biphenyl prepared by using benzene diazonium chloride?
6. How does nitrous acid react with primary, secondary, and tertiary amines?
7. Explain the following reactions in aniline: (i) Coupling reaction
   (ii) Schotten – Baumann reaction (iii) Carbylamine reacton.
8. Explain Gabriel's Phthalimide synthesis and Mustard oil reaction.
9. Write the following reactions: (i) Carbylamine reaction (ii) Gabriel's Phthalimide synthesis.
10. Write the following: (i) Mustard oil reaction (ii) Diazotisation reaction (iii) Gomberg reaction
11. Write notes on the following: (i) Mustard oil reaction (ii) Formation of Schiff's base.

21. BIOMOLECULES

10 MARKS (Q.NO:69B)

1.Elucidate the structure of fructose.

2. Prove the structure of glucose.

3. What is a peptide bond? Illustrate the formation of a peptide bond in glycyl alanine. Draw the structure of glucose and fructose.

4. How are carbohydrates classified? Give example for each.

22. CHEMISTRY IN ACTION

3 MARKS (Q.NO:51)

1. Write a brief note on Buna-S rubber?
2. Write a brief note on Antiseptic (Or) Why are Iodoform and phenolic solutions called antiseptic?
3. What are chromophores? Give two examples.
4. What are anesthetics? Give examples.
6. In what way are antacids important? (Or) What are antacids? Give an example.
7. Give the preparation of Buna-N rubber.
8. How is Nylon-66 prepared? Give its use.
9. What are artificial sweetening agents? Give two examples.
10. Give a note on antibiotics.
11. Write any three characteristics of dyes.
12. What are the functions of anti Oxidants?

5 MARKS (Q.NO:63)

1. Explain brief on characteristics of rocket propellants.
2. Write notes on anesthetics.
3. Write briefly on Buna rubbers.
4. How are Buna-S and Nylon – 66 prepared?
5. What are chromophores and auxochromes? Give two examples for each.
6. Explain briefly on colour and structure of dyes.

NAMING REACTIONS

16. HYDROXY DERIVATIVES

1. Bouveault – Blanc reduction - 140
2. Terelene reaction – 142
3. Sapanification reaction – 146
4. Cannizzaro reaction – 152
5. Nitro Glycerine reaction – 149
6. Dow's process – 157
7. Schotten – Baumann reaction – 162
8. Picric acid reaction – 164
9. Diazo – Coupling reactin – 165
10. Kolbe Schimidtt (or) Kolbe's reactin – 165
11. Riemer – Tiemann reaction – 165
12. Phthalein fusion reaction – 166
13. Lederer – Manasse reaction – 166
14. Acylation reaction – 161
15. Lucas test – 131
16. Victor Meyer test – 136
17. markonnikoff's reaction – 126

17. ETHERS

18. Wiliamson Synthasis – 184

18. CARBONYL COMPAUNDS

19. CARBOXYLIC ACIDS

20. ORGANIC NITROGEN COMPOUNDS

IMPORTANT MECHANISMS

COMPULSORY PROBLEM QUESTIONS BANK
70(A) HYDROXY DERIVATIVES

PTA BOOK EXERCISE PROBLEMS

1. An Organic compound 'A' has the formula C_2H_6O. If liberates hydrogen with metallic sodium. 'A' on oxidation with acidified dichromate gives 'B' (C_2H_4O). 'B'undergoes iodoform test 'B' on further oxidation gives 'C' ($C_2H_4O_2$). 'C' gives effervesencence with sodium bicarbonate solution. Identify A, B and C explain the reactions.
2. An Organic compound (A) (C_7H_8O) on oxidation with $Pb(NO_3)_2$ gives 'B' (C_7H_6O) 'B' has a bitter almond smell. 'A' when reduced with Hi/P gives the hydrocarbon 'C' what are A, B and C? Explain the reactions.
3. An Organic compound 'A' (C_6H_6O) gives violet colour with neutral $FeCl_3$ solution. When distilled with Zinc dust it gives the hydrocarbon 'B', 'A' with phthalic anhydride in the presence of con.H_2SO_4 gives 'C' ($C_{20}H_{14}O_4$) an indicator. What are A, B and C? Explain the reactions.
4. An aromatic hydrocarbon 'A' (C_9H_{12}) in obtained from benzene and propylene in the presence of anhydrous $AlCl_3$ 'A' on air oxidation gives 'B' ($C_9H_{12}O_2$) 'B' on acidification gives 'C' (C_6H_6O) and 'D' (C_3H_6O) and 'C' gives violet color with neutral $FeCl_3$ solution 'D' undergoes iodoform test. Identify A, B, C and D explain the reactions.
5. An organic compound 'A' (C_6H_6O) is a weak acid with NH_3 in the presence of anhydrous $ZnCl_2$ 'A' gives 'B' (C_6H_7N) 'A' with dimethyl sulphate gives 'C' (C_7H_8O). What are A,B and C? Explain the reaction?
6. An organic compounds 'A' ($C_2H_6O_2$) with PI_3 gives an alkene 'B'. 'A' with cone phosphoric acid gives a linear molecule 'C'. 'A' with cons H_2SO_4 gives a cyclic compound 'D'. What are A,B and C? Explain the reaction?
7. An organic compound 'A' $C_4H_{10}O$ liberates hydrogen with sodium. When heated with copper at 573K it gives 'B' (C_4H_8). 'A' with PCl_5 gives 'C'. What are A, B and C? Explain the reaction? An organic compound (A) of molecular formula C_3H_8O gives turbidity within 5-10 min on reaction with anhydrous $ZnCl_2$/HCl. Compound . on treatment with sodium hypochlorite gives a carbonyl compound (B) which on further chlorination gives compound (C) of molecular formula $C_3H_3OCl_3$. Identify (A), (B) and (c).
8. An organic compound (A) of molecular formula C_2H_6O on treatment with PCl_5 gives compound (B). Compound (B) reacts with KCN to give a compound (C) of molecular formula C_3H_5N which undergoes acid hydrolysis to give compound (D) which on treatment with soda lime gives a hydrocarbon. Identify (A), (B), (C) and (D) and explain the reactions**. [J-06)**
9. An organic compound A of molecular formula C_6H_6O gives violet colouration with neutral $FeCl_3$. Compound A on treatment with metallic Na gives compound B. compound B on treatment with CO_2 at 400K under pressure gives C. This product on acidification gives compound D ($C_7H_6O_3$) which is used in medicine. Identify A, B, C and D and explain the reactions**. [Oct-06]**
10. An organic compound A of molecular formula C_3H_6O on reduction with $LiAlH_4$ gives B. Compound B gives blue colour in Victor Meyer's test and also forms a chloride C with $SOCl_2$. The chloride on treatment with alcoholic KOH gives D. Identify A, B, C and D and explain the reactions.
11. An organic compound (A) C_3H_8O answers Lucas test-within 5-10 minutes and on oxidation forms B(C_3H_6O). This on further oxidation forms C($C_2H_4O_2$) which gives effervescence with Na_2Co_3 / $NaHCO_3$. B also undergoes Iodoform reaction. Identify A, B and C. Explain the conversion of A to B and C**. [J-07, J-09]**

12. An organic compound (A) of molecular formula C_6H_6O gives violet colour with neutral $FeCl_3$. (A) gives maximum of two isomers (B) and (C). when an alkaline solution of (A) is refluxed with CCl_4. (A) also reacts with $C_6H_5N_2Cl$ to give the compound (D) which is red orange dye. Identify (A), (B), (C) and (D). Explain with suitable chemical reactions**. [S-07]**
13. Compound A with molecular formula C_3H_6 is obtained from petroleum. When A is treated with chlorine at 773K compound B of molecular formula C_3H_5Cl is obtained. When B is treated with Na_2CO_3 solution at 773K/12 atm. it gives the compound C with molecular formula C_3H_6O, C on treatment with HOCl followed by hydrolysis NaOH gives D having molecular formula $C_3H_8O_3$. find A, B, C and D. Explain the reaction. **[M-08]**
14. Compound A of molecular formula C_7H_8 is treated with chlorine and then with NaOH to get compound B of molecular formula C_7H_8O. B on oxidation by acidified $K_2Cr_2O_7$ gives compound C of molecular formula C_7H_6O. compound C on treatment with 50% caustic soda gives the compound B and also D. Find A, B, C and D. Explain the reaction**. [J-08]**
15. An organic compound (A) C_7H_8O liberates hydrogen with metal sodium. (A) on treatment with acidic potassium dichromate gives (B) (C_7H_6O). Compound (B) when treated with conc. N_2H_4 & NaOH/KOH gives (A). (B) with acetic anhydride in the presence of sodium acetate gives (C) of molecular formula ($C_9H_8O_2$). Identify (A), (B) and (C). Explain the reactions involved. **[S-08]**
16. Two isomers (A) and (B) have the same molecular formula $C_4H_{10}O$. (A) when heated with copper at 573K gives an alkene (C) of molecular formula C_4H_8. (B) on heating with copper at 573K gives (D) of molecular formula C_4H_8O which does not reduce Tollen's reagent but answers iodoform test. Identify (A), (B), (C) and (D) and explain the reactions**. [M-09]**
17. Compound (A) of molecular formula C_3H_8O liberates hydrogen with sodium metal.With p/I_2 gives (B). Compound (B) on treatment with silver nitrite gives (C) which gives blue colour with nitrous acid. Identify (A), (B), (C) and explain the reaction. **[S-09]**
18. An organic compound X (C_6H_6O) gives maximum of two isomers Y and Z when an alkaline solution of X is refluxed with chloroform at 333K. Identify the compounds X,Y and Z and explain with proper chemical reactions.**[M.Q.Paper-I]**
19. An aromatic compound 'A' with molecular formula C_7H_8O gives hydrogen with metallic Na. 'A'on oxidation gives B C_7H_6O which does not reduce fehlings solution.When heat with concentrated NaOH 'B' gives two compounds 'A' and 'C' with molecular formula $C_7H_6O_2$. Identify A,B and C. Explain the reactions. **[M.Q.Paper-II].**
20. A simplest alkene 'A' with Bayer's reagent gives 'B'. With PI_3 B gives Back 'A' B with Con.Phosphric acid gives a linear molecule 'C'.Where as with Con.H2SO4 gives a cyclic molecule 'D'. What are A, B, C and D. Explain the reactions. **[M.Q.Paper-III]**
21. Two organic compound A and B have the same molecular formula C_2H_6O. A react with metallic sodium to give hydrogen where 'B' does not. A on strong oxidation gives C. 'C' gives effervescence with $NaHCO_3$. Identify A, B and C. explain the reactions.**[M.Q.Paper-IV]**
22. An aromatic compound 'A' has the molecular formula C_2H_6O. 'A' when heated with Al_2O_3 at 623K gives 'B' C_2H_4. 'B' when treated with alkaline $Kmno_4$ gives 'C'($C_2H_6O_2$). What are alkaline gives 'C'($C_2H_6O_2$). What are A,B and C. Explain the reactions. **[M.Q.Paper-V, Mar-2011].**

70. (B) d - BLOCK ELEMENTS

PTA EXCERCISE PROBLEM

1. Compound (A) also known as Blue vitriol can be prepared dissolving cupric oxide in dil H_2SO_4. 'A' on heating to 230^0C gives compound 'B' which is white in color. 'A' reacts with excess of NH_4OH and gives C which is complex salt. 'B' also reacts with H_2S and gives compound 'D' which is block in color. Find out A, B, C and D.Explain the reaction.

2. Compound 'A' is a powerful oxidizing agent and also it is a red orange crystal which melts at 396^0C A reacts with chloride salt and conH_2SO_4 to give 'B' which is reddish brown in colour. 'A' also reacts with an alkali to gives 'C' which is yellow in colour. Find out 'A', 'B' and 'C'. Explain the reaction.
3. An Element 'A' is obtained from the telluride Ore and is unaffected by dry (or) moist air. 'A' reacts with aqua regia to give 'B' and 'C' A also reacts with Cl_2 to give compound 'B'. Find A, B and C Explain the reaction. Give any one of the uses of 'A'.
4. An Element 'A' Occupies groups number II and Period number 4. This metal is extracted from its mixed sulphide are B. A reacts with dil.H_2SO_4 in presence of air to form 'C' which is blue in colour identify A, B, and 'C'. **(March -2007).**
5. An Element 'A' is obtained from argentite are. 'A' reacts with cone.H_2SO_4 to give cpd 'B'. 'A' also reacts with Cl_2 to give compound 'C' Find out A, B and C. Explain the reactions involved. Write any two uses of the element 'A'.
6. An Element 'A' in group number 12, period number 4 is extracted from its sulphide ore 'A' reacts with O_2 at 773K to give philosophers wool. A react with hot NaOH to give Compound 'C'. A also reacts with dil.HNO_3 and forms compound 'D' with a liberation of N_2O Find out A, B, C and 'D' Explain the reactions.
7. An Element 'A' belongs to group numbers II and period number 4 is extracted from the ore copper pyrite. A react with oxygen at two different temperature forming compound B and C. A also reacts with conc.HNO_3 to give compound 'D' with the evaluation of NO_2 Find out A, B, C and 'D' Explain the reactions. **(Sep-07,Mar-10).**
8. Silver reacts with dil.HNO_3 and gives compound 'A' which on heating at 723K gives 'B'. 'B' on Further heating gives 'C' Further heating gives 'C' further 'A' reacts with KBr to give compound 'D'. Which is highly useful in photography. Identify A, B, C and D. explain the reactions. **(June-2006, March- 2009).**

PTA MODEL QUESTION PAPERS :-

9. Chief ore of chromium (A) on roasting with sodium carbonate gives compound (B) and (C). (B) an acidification gave compound (D) which on treatment with KCl gave compound (E). Identify the compounds A, B, C, D and E. Explain with proper chemical reaction. **[Model Q Paper – I, March-2011)**
10. A reddish brown metal 'A' on heating to redness gives 'B' which is Black in colour. 'B' dissolves in dil.H_2SO_4 to give 'C' which is blue crystal. On heating to 720^0 C gives back 'B'. What are A, B, C, D. **[Model Q Paper-II](March-10)**
11. A sulphate compound of a metal in group II, is also called as ~~blue~~>Vitriol.>The Compound undergoes deaxmposition at Various temperatures A 373K B 503K C 993K D Identify the compound A, B, C and D. Explain the reaction. **(June -09, Model Q paper – II)**
12. An Element 'A' belongs to group number II period number 5 is a lustrous white metal 'A' reacts with dil.HNO_3 give 'B'. 'B' with KI gives 'C' which is bright yellow in colour. Identify A, B, and C. Explain the Reaction**. (Model Q Paper – IV)**
13. A bluish white metal when treated with dil.HNO_3 give 'A' along with Zinc Nitrate and water. With very dilute HNO_3, it gives 'B' along with Zinc nitrate and water.The metal heated with air gives 'C'. **(Model Q. Paper V)**
14. An element (A) belong to group number II and period 4. (A) is a reddish brown metal. (A) reacts with HCl in the presence of air and gives compound (B). (A) also reacts with con.HNO_3 to give compound (C) with the liberation of NO_2. Identify (A), (B), (C). Explain the reaction. **[M-06]**

15. The sulphide ore of an element of group 12 when roasted gave compound A which on reduction with carbon gave the element B. The carbonate C of this element is used for skin disease. Identify A, B and C write the required reaction. **[O-06]**

16. An element A occupies group number 11 and period number 4. This metal is extracted from its mixed sulphide ore B. A reacts with dil.H_2SO_4 in presence of air and forms C which is colouless. With water C gives a blue compound D. Identify A,B,C and D.

17. The metal B is extracted from the ore A. On treatment with dil.nitric acid metal B gives a compound C, which is also known as Lunar Caustics. The compound C on treatment with KI gives a yellow precipitate D. Find A, B, C and D. Explain the reactions of the formation of A and D. **[M-08]**

18. A bluish white metal A present in 4th period and 12th group on heating in air gives a white cloud B. Metal A on treatment with conc. H_2SO_4 gives the compound C and SO_2 gas. Find A, B and C. Explain the reactions**. [J-08]**

19. An element belonging to group 12 and period 4 is bluish white in colour. (A) reacts with hot conc. H_2SO_4 forming (B) with liberation of N_2O. Identify (A) also reacts with dil.HNO_3 forming (C) with liberation of N_2O.Identify A,B andC.Explain the reactions involved. **S-08**

20. Compound A is a sulphate compound of group II element. This compound is also called Blue Vitriol. The compound undergoes decomposition at various temperatures.**[J-09]**

21. A bluish white metal when treated with dilute nitric acid gives (A) along with zinc nitrate and water. With very dilute acid it gives (B) along with zinc nitrate and water. The metal when heated with air gives (C). What are (A), (B) and (C)? Explain the reaction.**[S-09]**

BEST WISHES TO SUCCESS FOR YOUR BRIGHT FUTURE

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