11th CHEMISTRY

Government Public questions

Unitwise

March-2019

June-2019

September-2020

September-2021

May-2022

july-2022

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PREFACE

"Praise the lord"

"Education is not the learning of facts,
But the training of the mind to think"

-Albert Einstein

"Education is the movement from darkness to light "

Respected Teachers/ Dear students

This guide is based on the six government public 11THchemistry questions. This guide contains more than 200 questions .and 90 one marks. (question and answer)

The questions asked in government public examination are very important so Students should keep reading this well.

The purpose of creating this guide is for students to get higher marks.This guideis also created for slow learning students to pass.

You have any doubt of question and answer in this material contact your chemistry teacher or me

I hope this guide will be very useful for Students and Teachers. My heartfelt **thanks** to all the **educational webpage**.Teachers or students can let me know their valuable feedback regarding this guide.

God bless all

All the best

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NOTE:

Government public question paper march 2019	- mar19
Government public question paper june 2019	- jun19
Government public question paper September 2020	- sep20
Government public question paper September 2021	- sep21
Government public question paper may2022	-may22
Government public question paper july2021	-jul22
Interior page number	-ipn

Time allowed : 2.30hours **March-2019** **Maximum marks : 70**

PART-I

Note : i)Answer all the questions.

ii)choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer **15 X 1 = 15**

1.many of the organic compounds are inflammable because of Its :

a) vander waal's force b) co-ordinate nature

c) covalent nature d) ionic nature

2.When Δng is negative in chemical equilibrium reaction then :

a) $K_p<K_c$ b) $K_p=1/K_c$

c) $K_p=K_c(RT)^{-ve}$ d) $K_p > K_c$

3.Find A in the following reaction

$$CaO + 3C \xrightarrow{3273K} \_\_A\_\_ + CO$$

a) CaC_2 b) CO_2 c) Ca d) Ca_2O

4.Splitting of spectral lines in an electric field is called :

a) Compton effect **b) stark effect**

c) Zeeman effect d) shielding effect

5.Which of the following species does not exert a resonance effect ?

a) $C_6H_5NH_2$ b) $C_6H_5NH_3^+$ c) C_6H_5OH d) C_6H_5Cl

6.Match the following :

Compound	**uses**
1)Chloro picrin	i) detection of primary amine
2)Methyl isocyanide	ii) DDT
3)Chlolro benzene	iii) paint remover
4)Meythylene chloride	iv) soil sterilizer

a) (1)- (iv), (2)-(iii) , (3)-(ii), (4)-(i) b) (1)- (iii), (2)-(iv) , (3)-(ii), (4)-(i)

c) (1)- (i), (2)-(ii) , (3)-(iv), (4)-(iii) d) (1)- (iv), (2)-(i) , (3)-(ii), (4)-(iii)

7.use of hot air ballone in meteorological observatory is an application of :

a) Kelvin's Law b) Brown's Law

c) Boyle's Law d) Newton's Law

8.what is the pH of rain water ?

a) 5.6 b) 4.6 c) 6.5 d) 7.5

9. which compound is named as "blue john" among the following compounds ?

a) $Ca_3(PO_4)_2$ b) CaO c) CaH_2 d) CaF_2

10.The element with positive electron gain enthalpy is _____

a) Argon b) Fluorine

c) Hydrogen d) sodium

11.which of the following molecule does not contain π bond ?

a) CO_2 b) H_2O c) SO_2 d) NO_2

12.which of the following compound has same percentage of carbon as that of ethylene (C_2H_4) ?

a) benzene b) ethane

c) propene d) ethyne

13.The SI unit of molar heat capacity is : _____

a) JK^{-1} mol^{-1} b) KJ mol^{+1} c) KJ mol^{-1} d) cm

14.What percentage of solution of H_2O_2 is called as "100-volume' H_2O_2 ?

a) 15% b) 50% c) 20% d) 30%

15.osmotic pressure (π) of a solution is given by the relation :

a) π RT =n b) V= π nRT

c) π= n RT d) π V=nRT

PART-II

Answer any six of the following questions. Question no.24 is compulsory. 6 X 2 = 12

16.State and explaine pauli's exclusion principle.

17.Define valency

18.What are ideal gas ?

19.State the third law of thermodynamics ?

20.What is called bond length ? Name the techniques through which the length of a bond can be determined .

21.Describe the reaction involved in the detection of nitrogen in an organic compound by lassaigne method.

22.How is alkane prepared from grignard reagent ?

23.Define- acid rain

24.Which is the suitable method for detection of nitrogen present in food and fertilizers?

PART-III

Answer any six of the following questions. Question no.33 is compulsory 6 X 3 = 18

25.Calculate the equivalent mass of H_2SO_4

26.Explain diagonal relationship .

27.How is Tritium prepared ?

28.Define –Le-Chatelier principle.

29.State the term "isotonic solution"

30.Both C_2H_2 and CO_2 have the same structure. Explain why.

31.Write note on Williamson's synthesis.

32.Explain why $Ca(OH)_2$ is used in white washing .

33.Give the structural formula for the following compounds.

a)m-dinitrobenzene b)p-dichlorobenzene c)1,3,5,Tri-methyl Benzene

PART-IV

Answer all the questions. **5 X 5 = 25**

34. a) i) calculate oxidation number of oxygen in H_2O_2

ii) Write the de-broglie equation.

(OR)

b) i)State and explain Dobereiner"s "triad"

ii) complete the following equation

Na_2O_2 + ? → Na_2SO_4+ H_2O_2

35. a) i) Among the alkaline earth metals BeO is insoluble in water but other oxides are soluble .why ?

ii) State Diffusion law.

(OR)

b) i) calculate the entropy change during the melting of one mole of ice into water at 0^0c. enthalpy of fusion of ice is 6008 J mol^{-1}.

ii) Write the balanced chemical equation for the $K_c = \frac{[CaO_{(S)}][CO_{2(g)}]}{[CaCO_{3(S)}]}$

36. a) i) NH_3 and HCl do not obey Hentry's law. Why ?

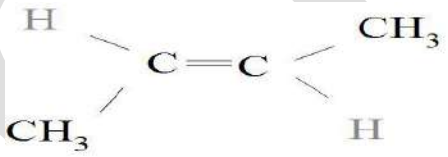
ii) Write the structure of the following compounds.

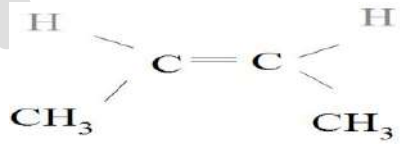
(A) NH_3 (B) BF_3

(OR)

b) i) Identify the cis and trans isomers for the following compounds

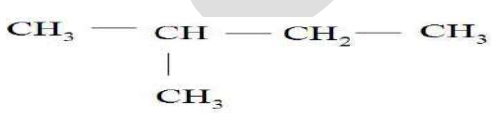
a) b)



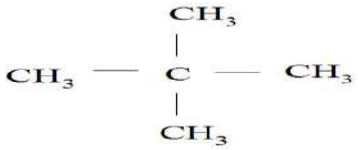


ii) Explain with example the positive mesometric effect.

37. a) i) Write the IUPAC names for the following compounds.



(A)



(B)

ii) What are nucleophiles and electrophiles ? give one example each

(OR)

b) i) How will you get the following products with the given reactants ?

(A) Acetylene → Benzene

(B) Phenol → Benzene

(C) Benzene→ Tolune

ii) Write any two different components you get during fractional distillation of coal tar at any two different temperatures.

38.a) i) A compound having the empirical formula C_6H_6O has the vapour density 47. Find its molecular formula.

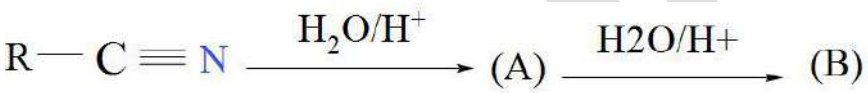
ii) The simple aromatic hydrocarbon compound (A) reacts with bromine to give (B).compound (A) reacts with Raney Ni and gives (C). Identify (A) , (B) and (C).

(OR)

b) i) $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$

Calculate the standard entropy change for the above reaction, given the standard entropies of $CO_{2(g)}$, $C_{(s)}$, $O_{2(g)}$ are 213.6,5.740 and 205 JK^{-1} respectively.

ii) Identify the compound (A) and (B)



Time allowed : 2.30hours **Maximum marks : 70**

JUNE-2019

PART-I

Note : i) Answer all the questions.

ii) choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer . **15 X 1 = 15**

1.The oxidation number of carbon in CH_2F_2 is _____

a) +4 b) -4 c) 0 d)+2

2.The energy of an electron in the third orbit of hydrogen atom is –E . The energy of an electron in the first orbit will be _____

a) -3E b) $-\frac{E}{3}$ c) $-\frac{E}{9}$ d) -9E

3.The effective nuclear charge experienced by the d^1 electron in the given electronic configuration, $(1s)^2\ (2s,2p)^8\ (3s,3p)^8\ (3d)^1\ (4s)^2$ is :

a) 4 b) 3 c) 2.1 d) 6.9

4.The type of H-bonding present in orthonitro phenol and p-nitro phenol are ___respectively.

a) Inter molecular H-bonding and intra molecular H-bonding

b) Intra molecular H-bonding and inter molecular H-bonding

c) Intra molecular H-bonding and no H-bonding

d) Intra molecular H-bonding and intra molecular H-bonding

5.When CaC_2 is heated in atmospheric nitrogen in an electric furnace, the compound formed is _____

a) $Ca(CN)_2$ b) CaNCN c) CaC_2N_2 d) $CaNC_2$

6.When an ideal gas undergoes unrestrained expansion, no cooling occurs because the molecules _____

a) are above the inversion temperature b) exert no attraction force on each other

c) do work equal to the loss in kinetic energy d) collide without loss of energy

7.Among the following statements, which one is /are correct ?

i) During cyclic process the amount of heat absorbed by the surrounding is equal to work done on the surrounding

ii)Refractive index is an example for intensive property

iii) If the enthalpy change of a process is positive then the process is spontaneous

iv) The entropy of an isolated system increases during spontaneous process

a) (i), (ii), (iii) b) (i), (iv) c) (ii), (iv) d) (ii) only

8.If k_b and k_f for a reversible reaction are 0.8×10^{-5} and 1.6×10^{-4} respectively ,the value of equilibrium constant is _____

a) 20 b) 0.2×10^{-1} c) 0.05 d) 0.2

9.Assertion : Mixture of carbon tetrachloride and chloroform show positive deviation from raoult's law

Reason : In the mixture the inter molecular force of attraction between chloroform and carbon tetrachloride is weaker than those between molecules of carbon tetrachloride and chloroform molecules.

a) Both assertion and reason are correct and reason is the correct explanation of assertion

b) Both assertion and reason are correct and reason is not the correct explanation for assertion

c) Both assertion and reason are false

d) Assertion is true , but reason is false

10.Shape and hybridation of IF_5 are :

a) Trigonal bipyramidal sp^3d^2 b) Trigonal bipyramidal sp^3d

c) Square pyramidal sp^3d^2 d) Octahedral, sp^3d^2

11.Which of the following is optically active ?

a) 3-chlolro pentane b) 2-chloro propane

c) meso-tartaric acid d) glucose

12.Which of the following species is not electrophile in nature ?

a) Cl^+ b) BH_3 c) H_3O^+ d) $^+NO_2$

13._____group is ortho para directing and deactivating group

a) amino b) methyl c) halogen d) aldehyde

14.The raw material for Rasching process is _____

a) chloro benzene b) phenol c) benzene d) anisole

15._____ cause kidney damage

a) Cadmium , mercury b) Lead, Cadmium

c) Freon, Fluoride d) copper, Cadmium

PART-II

Answer any six from the following questions.Q.no.24 is compulsory 6 X 2 = 12

16.What is syn gas ? How it is prepared ?

17.Write any two similarities between beryllium and aluminium .

18.What is inversion temperature ?

19.What is the effect of added inert gas on the rection at equilibrium ?

20.Linear form carbon dioxide molecules has two polar bonds .yet the molecule has zero dipole moment. Why ?

21.How do you detect the presence of nitrogen and sulphur together in anorganic compound?

22.What happens when acetylene undergoes ozonolysis ?

23.What is green chemistry ?

24.Calculate the orbital angular momentum for d and f orbital.

PART-III

Answer any six from the following questions. Q.No.33 is compulsory 6 X 3 = 18

25.What do you understand by the term mole ?

26.Ionisation potential of nitrogen is greater than that of oxygen . explain by giving appropriate reason.

27.Among the alkali metal halides, which is covalent ? explain with reason.

28.Derive ideal gas equation.

29.Define molar heat capacity. Give its unit.

30.What is vapour pressure of a liquid ? what is relative lowering of vapour pressure ?

31.explain a suitable method for purifying and separating liquids present in a mixture having very close boiling point.

32.What is polymerisation ? explain the two types of polymerisation rection of acetylene .

33.The bond length between all the four carbon atoms is same in 1,3-butadiene. Explain

PART-IV

Answer all the following questions. 4 X 5 = 20

34.a) i) What are auto redox rections ? give an example .

ii) Define orbital.What are the n and l values for 3px and $4dx^2$-y^2 electron ?

(OR)

b) i) Why hydrogen peroxide is stored in plastic containers, not in glass container ?

ii) Give the general electronic configuration of lanthanides and actinides.

35.a) i) why blue colour appears during the dissolution of alkali metals in liquid ammonia ?

ii) what is boyle's temperature ? what happens to real gases above and below the boyle's temperature ?

(OR)

b) i) Derive the relation between k_p and k_c for a general homogeneous gaseous reaction.

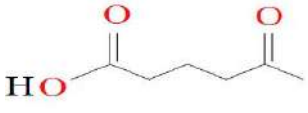
ii) How do you measure heat changes at constant pressure ?

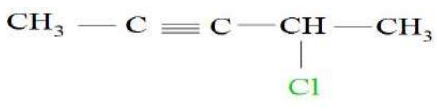
36.a) i) Draw the M.O diagram for oxygen molecule . calculate its bond order and magnetic character.

ii) Draw and explain the graph obtained by plotting solubility versus temperature for calcium chloride .

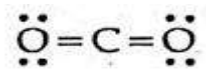
(OR)

b) i) Write the IUPAC names for the following compounds :

(x) 

(Y) 

(Z) 

ii) Calculate the formal charge on carbon and oxygen for the following structure 

37.a) i) explain about inductive effect .

ii) What do you mean by conformation ? Explain about staggered conformation in ethane .

(OR)

b) i) Among the following compounds ,o-dichloro benzene and p-dichloro benzene , which has higher melting point ? explain with reason .

ii) Write notes on the adverse effect caused by ozone depletion.

38.a) i) calculate the uncertainty in the position of an electron, if the uncertainty in it velocity is 5.7×10^5 ms^{-1}

ii) What is the mass of glucose ($C_6H_{12}O_6$) in it one litre solution which is isotonic with 6gl-1 of urea (NH_2CONH_2) ?

(OR)

b) i) An organic compound (A) of molecular formula C_2H_6O, on heating with conc.H_2SO_4 gives compound (B) . (B) on treating with cold dilute alkaline $KMnO_4$ gives compound (C) . Identify (A), (B) and (C) and explain the reactions.

ii) A simple aromatic hydrocarbon (A) reacts with chlorine to give compound (B) . compound (B) reacts with ammonia to give compound (C) which undergoes carbylamines reaction. Identify (A), (B) and (C) and explain the reactions.

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Time allowed : 3.00hours **Maximum marks : 70**

Sep-2020

PART-I

Note : i) Answer all the questions.

ii) choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer . 15 X 1 = 15

1.The maximum number of electrons that can be accommodated in L orbit is

a) 8 b) 2 c) 4 d) 6

2.The relative molecular mass of ethanol is ___

a) 0.46g b) 4.6 g c) 460g d) 46g

3.Intra molecular hydrogen bonding is present in___

a) Ortho-nitro phenol b) Ice c) Water d) Hydrogen fluoride

4.Ozone deplection will cause

a) Global warning b) Forest fire c) Eutrophication d) Bio-magnification

5.Among the following which is the path function ?

a) G b) U c) H d) q

6. match the following

1)Iodoform	i) Fire extinguisher
2)Carbon tetrachloride	ii)Insecticide
3)CFC	iii) Antiseptic
4)DDT	iv)Refrigerants

a) (1)- (iii), (2)-(i) , (3)-(iv), (4)-(ii) b) (1)- (ii), (2)-(iv) , (3)-(i), (4)-(iii)

c) (1)- (iii), (2)-(ii) , (3)-(iv), (4)-(i) d) (1)- (i), (2)-(ii) , (3)-(iii), (4)-(iv)

7.Cold dilute alkaline $KMnO_4$ is known as

a) Schiff’s reagent b) Fenton”s reagent

c) Tollen’s reagent d) Baeyer’s reagent

8.osmotic pressure (π) of a solution is given by the relation

a) π RT=n b) π= n RT

c) π V=nRT d) None of these

9.n-propyl bromide on rection with alcoholic KOH gives

a) Butyl alcohol b) Propene

c) Butene d) Propyl alcohol

10.Which of the following is incorrect statement ?

a) Equilibrium constant varies with temperature

b) For a system at equilibrium ,Q is always less than the equilibrium constant

c) Equilibrium can be attained from either side of the reaction

d) Presence of catalyst affects both the forward reaction and reverse reaction to the same extent.

11.Assertion : Helium has the highest value of ionisation energy among all the elements known.

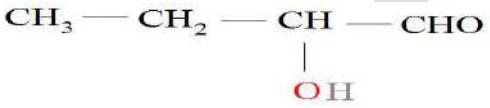
Reason : Helium has the highest value of electron affinity among all the elements known.

a) Both assertion and reason are false

b) Both assertion and reason are true and the reason is correct explanation for the assertion

c) Both assertion and reason are true but the reason is not the correct explanation for the assertion

d) Assertion is true and reason is false .



12.Write the IUPAC name of

a) 1-formyl propanol b) 1-hydroxy butanal

c) 2-hydroxy butanal d) 3- hydroxy butanal

13.Formula of Gypsum is

a) $CaSO_4$ b)$CaSO_4.2H_2O$

c) $CaSO_4.\frac{1}{2}H_20$ d) $CaSO_4.H_20$

14.Gases tent to behave ideally only at

a) Low temperature and low pressure b) High temperature and High pressure

c) High temperature and low pressure d) Low temperature and High pressure

15.Which of the following is electron deficient ?

a) NH_3 b) PH_3 c) $(CH_3)_2$ d) BH_3

PART-II

Answer any six from the following questions.Q.no.24 is compulsory. 6 X2 = 12

16.Define basicity.Find the basicity of ortho-phosphoric Acid.

17.Write the exchange reactions of Deuterium.

18.state zeroth Law of Thermodynamics.

19.Explain homogeneous and heterogeneous equilibria.

20.Write the shape and molecular geomentry for BF_3

21.Which element exhibits maximum catenation and why ?

22.Write the no bond resonance structure shown by propene ?

23.Give the structure and uses of DDT .

24.In degenerate orbitals, why do the completely filled and half filled configurations are more stable than the partially filled configurations ?

Part-III

Note : Answer any six questions. Question NO.33 is compulsory. 6 X 3 =18

25.State Heisenber's Uncertainty Principle .

26.Derive ionic radius using pauling's method .

27.How do you convert para hydrogen into ortho hydrogen.

28.Distinguish between extensive and intensive property.

29.Calculate the mole fraction of methanol and water when
0.5 mole of methanol is mixed with 1.5 moles of water.

30.What is hybridisation ? mention the type of hybridization found in CH_4

31.Explain the different types of polymerisation in ethyne.

32.What is green house effect ? Name the gases that cause green house effect .

33.Explain geometrical isomerism in 2-butene.

PART-IV

Note : Answer all the questions . 5 X 5 = 25

34. a) Calculate the empirical formula and molecular of a compound containing 76.6% carbon,6.38% of hydrogen and rest oxygen. Its vapour density is 47.

(OR)

b) i) Calculate the total number of angular nodes and radial nodes present in 3d and 4f orbitals.

ii) Explain why the electron affinity of Be and N is almost zero

35.a) i) Write the laboratory method of preparation of hydrogen .

ii) Name the different methods of liquefaction of gases.

(OR)

b) i) How is bleaching powder prepared ?

ii)Write the uses of magnesium.

iii)Write the mathematical formula for compressibility factor 'Z'

36.a) i)Derive the relation between enthalpy ΔH and internal energy ΔU for an ideal gas.

ii) Define reaction quotient.

(OR)

b) i) Calculate the entropy change during the melting of one mole of ice into water at 0^0C and 1 atm pressure. Enthalpy of fusion of ice is 6008J mol^{-1}

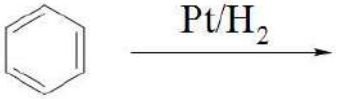
ii) Write any four postulates of molecular orbital theory.

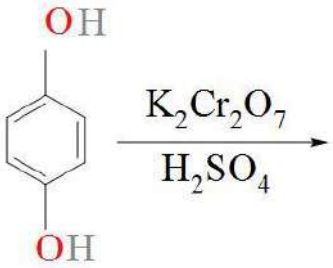
37.a) i)What is van't hoff factor 'i' ?

ii) complete

A) $H_2C=CH_2 + H\text{-}Br \xrightarrow{\text{Benzoyl peroxide}}$

B) $CH_3CHO \xrightarrow{\text{Acid dichromate}}$

C) 

D) 

(OR)

b) Explain the purification of a solid organic compound by crystallization method

38.a) i) write Brich reduction .

ii) Write any three strategies to control environment pollution.

(OR)

b) explain the mechanism involved in the elimination reaction of tertiary butyl chloride with alcoholic KOH.

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Time allowed : 3.00hours **Maximum marks : 70**

Sep-2021

PART-I

Note : i) Answer all the questions.

ii) choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer . 15 X 1 = 15

1. Which one of the following of presents 180g of water ?

a) $\frac{6.022 \text{ X } 10^{24}}{180}$ moles of water b) 5 moles of water

c) $6.022 \text{ X } 10^{24}$ moles of water d) 90 moles of water

2.Which of the following compound(s) has/have percentage of carbon same as that in ethylene (C_2H_4) ?

a) benzene b) propene c) ethane d) ethyne

3.Assertion ; permanent hardness of water is removed by treatment with washing soda

Reasons : Washing soda reacts with soluble calcium and magnesium chloride and sulphate in hard water to from insoluble carbonates.

a) Assertion is true but reason is false

b) Both assertion and reason are true and reason is the correct explanation of assertion

c) Both assertion ans reason are false

d)Both assertion and reason are true but reason is the correct explanation of assertion.

4.Flame colour of potassium salts in bunsens burner

a) Lilac (violet) b) crimson red c) Apple green d) yellow

5. Formula of plaster of paris

a) $3CaSO_4.H_2O$ b) $CaSO_4.2H_2O$ c) $2CaSO_4.2H_2O$ d) $CaSO_4.\frac{1}{2}H_2O$

6. Rate of diffusion of a gas is :

a) directly proportional to the square root of its molecular weight

b) directly proportional to its density

c) inversely proportional to the square root of its molecular weight

d) directly proportional to its molecular weight

7. Heat of combustion is always :

a) zero b) positive

c) either positive or negative d) negative

8. For the following reversible rections at equilibrium A + B $\rightleftharpoons$ C. If the concentration of the reactants A and B are doubled, then the equilibrium constant will :

a) be halved b) be doubled

c) remain the same d) become one fourth

9.The molality of a solution containing 1.8g of glucose dissolved in 250g of water is

a) 0.02M b) 0.2M c) 0.04M d) 0.01M

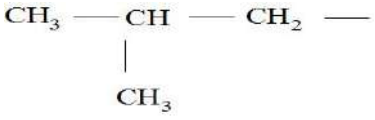
10.Match the following

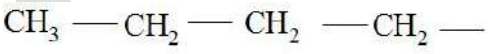
1) N_2 molecule	i) chemical bond
2) BF_3 molecule	ii) Trible covalent bond
3) HF molecule	iii) Electron deficient molecule
4) NaCl	iv) polar covalent bond

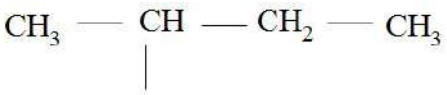
a) 1)- iii) , 2)- i) , 3)-iv) , 4)- ii) b) 1)-ii) , 2)- iv) , 3)-i) , 4)- iii)

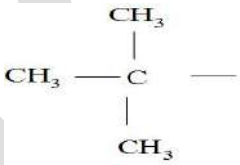
c) 1)- i) , 2)- iv) , 3)- ii) , 4)- iii) d) 1)- ii) , 2)-iii) , 3)- iv) , 4)- i)

11.The structure of isobutyl group in organic compound

a) 

b) 

c) 

d) 

12.Which of the following is optically active ?

a) meso-tartaric acid b) 3-chloropentane

c) glucose d) 2-chloropropane

13.The geometrical shape of carbocation is

a) planar b) linear c) pyramidal d) tetrahedral

14.An alkene is obtained by decarboxylation of sodium propionate.same alkene can be prepared by :

a) reduction of 1-chloro propane b) catalytic hydrogenation of propene

c) reduction of bromo methane d) action of sodium metal on iodomethane

15.Of the following compounds , which has the highest boiling point?

a) t-butyl chloride b) n-butyl chloride

c) n-propyl chloride d) Isobutyl chloride

PART-II

Answer any six from the following questions.Q.no.24 is compulsory. 6 X 2 = 12

16.What is the empirical formula of the following ?

a) Fructose ($C_6H_{12}O_6$) ii) Caffeine ($C_8H_{10}N_4O_2$)

17.State Aufbau principle

18.How do you convert para hydrogen into ortho hydrogen ?

19.Give any two characteristics of gibbs free energy ?

20.Define Hess's law of constant heat summation.

21.What is the relation between K_P and K_C ? Give one example for which K_P is equal to K_C.

22.What is molal depression constant ?

23.Write short notes on Swarts reaction ?

24.Complete the following :

a) $CH_3\text{-}CH{=}CH_2 + H_2 \xrightarrow{Pt}$

b) $CH_3MgCl + H_2O \longrightarrow$

Part-III

Note : Answer any six questions. Question NO.33 is compulsory. **6 X 3 = 18**

25. Distinguish between oxidation and reduction .

26.Define electronegativity. State the trends in the variation of electronegativity in group and period

27.What are homogeneous and heterogeneous equilibria? Give example

28.What are ideal solutions ? Give example

29.Give the shapes of molecules predicted by VSEPR theory

a) $BeCl_2$ b) NH_3 c) H_2O

30.Give the general formula for the following class of organic compounds

a) Alkanes b) Alkenes c) Alkynes

31.What is resonance ?

32.Suggest a simple chemical test to distinguish propane and propene

33.Inside a certain automobile engine , the volume of air in a cylinder is 0.375 dm^3 , when the pressure is 1.05atm . When the gas is compressed to a volume of 0.125 dm^3 at the same temperature , What is the pressure of the compressed air ?

PART-IV

Note : Answer all the questions . **5 X 5 = 25**

34. a) i) What is exchange energy ?

ii) Write a note on principal quantum number

(OR)

b) i) Define atomic radius.

ii) Explain diagonal relationship

35. a) Discuss the similarities between beryllium and aluminium

(OR)

b) i) State the first law of thermodynamics

ii) What are the conditions for the spontaneity of a process?

36. a) How will you determine the molar mass of a solute from osmotic pressure ?

(OR)

b) i) Define Bond Order.

ii) What are the salient features of VB theory ?

37. a) i) What is meant by homologous series ?

ii) Give the structure for the following compounds .

1) 3-methylpentane
2) 2-methylpropan-2-ol
3) Propanone

(OR)

b) Explain the formation of H_2 molecule using MO-theory

38. a) i) How does Huckel rule help to decide the aromatic character of a compound ?

ii) Write the rection for conversion of acetylene to benzene.

(OR)

b) Simplest alkene (A) rects with HBr to form compound (B). Compound (B) reacts with ammonia to from compound (C) of molecular formula C_2H_7N. Compound (C) undergoes carbylamines test. Identify (A), (B) and (C).

****

Time allowed : 3.00hours **Maximum marks : 70**

MAY-2022

Part-I

Note : i) Answer all the questions. **15 X 1 = 15**

ii) choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer

1.Which of the following is aliphatic saturated hydrocarbon ?

a) C_9H_{18} b) C_8H_{14} c) C_8H_{18} d) All of the above

2.Equimolal aqueous solutions of NaCl and KCl are prepared . If the freezing point of NaCl is -2^0c , the freezing point of KCl solution is expected to be

a) -1^0C b) -2^0C c) 0^0C d) -4^0

3.The correct relative order of +I effect of alkyl groups is :

a) $-C(CH_3)_3 > -CH(CH_3)_2 > -CH_2CH_3 > -CH_3$

b) $-CH_3 > -CH_2CH_3 > -CH(CH_3)_2 > -C(CH_3)_3$

c) $-CH_2CH_3 > -CH_3 > -C(CH_3)_3 > -CH(CH_3)_2$

d) $-CH(CH_3)_2 > -C(CH_3)_3 > -CH_2CH_3 > -CH_3$

4.7.5 g of a gas occupies a volume of 5.6 L at 0^0C and 1 atm pressure.The gas is

a) CO b) NO c) CO_2 d) N_2

5.Assertion : In monohaloarenes, electrophilic substitution occurs at ortho and para positions

Reason : Halogen atom is a ring deactivator

a) Assertion is true but reason is false

b) Both assertion and reason are true and reason is the correct explation of assertion

c) Both assertion and reason are false

d) Both assertion and reason are true but reason is not the correct explanation of assertion

6.The intensive property among the quantities below is :

a) Enthalpy b) mass c) $\frac{mass}{volume}$ d) volume

7. Which one of the following is incorrect statement ?

a) Presence of catalyst affects both the forward reaction and reverse reaction to the same extent.

b) for a system at equilibrium Q is always less than the equilibrium constant

c) equilibrium constant varies with temperature

d) equilibrium can be attained from either side of the reaction

8.Match of following

1) $-NO_2$	i) propyl
2) $-OCH_3$	ii) Amino
3) $-CH_2-CH_2-CH_3$	iii)Methoxy
4) $-NH_2$	iv) Nitro

a) (1)- (iii), (2)-(ii) , (3)-(iv), (4)-(i) b) (1)- (iii), (2)-(iv) , (3)-(i), (4)-(ii)

c) (1)- (iv), (2)-(iii) , (3)-(i), (4)-(ii) d) (1)- (ii), (2)-(i) , (3)-(iv), (4)-(iii)

9.Spodumene is the mineral source for which of the following alkali metal ?

a) Lithium b) Sodium c) Rubidium d) Potassium

10.Which of the following has highest hydration energy ?

a) $BaCl_2$ b) $MgCl_2$ c) $SrCl_2$ d) $CaCl_2$

11.Tritium nucleus contains :

a) 1p+2n b) 1p+on c) 1p+1n d) 2p+1n

12.Which one of the following is diamagnetic ?

a) O_2^{2-} b) O_2^{+} c) O_2 d) None of these

13.Splitting of spectral lines in an electric field is called :

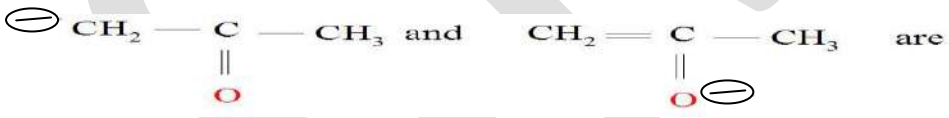
a) Compton effect b) Zeeman effect

c) Stark effect d) Shielding effect

14.A bottle of ammonia and a bottle of HCl connected through a long tube are opened simultaneously at both ends. The white ammonium chloride ring will be first formed :

a) near the ammonia bottle b) at the centre of the tube

c) throughout the length of the tube d) near the hydrogen chloride bottle

15.  and are

a) optical isomers b) resonating structures c) conformers d) tautomers

Part-II

Note : answer any six questions. Question No.24 is compulsory **6 X 2 = 12**

16.Define Gram equivalent mass

17.Calculate the maximum number of electrons that can be accommodated in L shell

18.Mention the three types of covalent hydrides .

19.What are the condition for the spontaneity of a process

20.Explain sign convention of heat

21.Give a balanced chemical equation for the equilibrium reaction for which the equilibrium constant is given by expression Kc = $\frac{[NH_3]^4[O_2]^5}{[NO]^4[H_2O]^6}$

22.Define the term "isotonic" solution

23.How will you convert ethyl chloride to ethane ?

24.Complete the following reactions

i) $C_6H_5Cl + 2NH_3 \xrightarrow[50\ atm]{250^0C}$

ii) $C_6H_5Cl + 2Na + Cl\text{-}C_6H_5 \xrightarrow[\Delta]{Ether}$

PART-III

Note : Answer any six questions. Question No.33 is compulsory **6 X 3 = 1 8**

25.Calculate the oxidation number of underlined elements .

i) $\underline{C}O_2$ ii) $H_2\underline{S}O_4$

26.Define electron affinity

27.State Dalton Law of partial pressures.

28.Write the formula to calculate the molar mass of a solute from realative lowering of vapour pressure values.

29.Describe the formation of HF molecule by orbital overlap

30.What is meant by optical isomerism ?

31.Give any three differences between nucleophiles and electrophiles

32.what happens when ethylene is passed through cold dilute alkaline potassium permanganate ?

33.The equilibnrium concentrations of NH_3 and N_2 and H_2 are 1.8 $x10^{-2}$M , 1.2$x10^{-2}$M and 3x 10^{-2} M respectively. Calculate the equilibrium constant for the formation of NH_3 from N_2 and H_2

PART-IV

Note : Answer all the questions. **5 X 5 = 25**

34.a)i) How many orbitals are possible for n=4 ?

ii) Write the electronic configuration and orbital diagram for nitrogen ?

(OR)

b) Describe the pauling method for the determination of ionic radius .

35.a) i) What are the reasons for the anomalous properties of Berylium ?

ii) Give any three properties of beryllium that are different from other elements of the group

(OR)

b) Explain the characteristics of internal energy .

36.a) How will you determine the molar mass of solute from elevation of boiling point ?

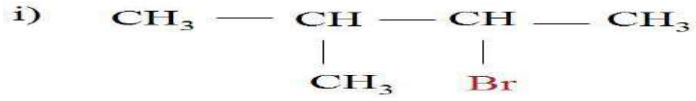
(OR)

b) Define i) Bond length ii)Bond angle iii)Bond enthalpy

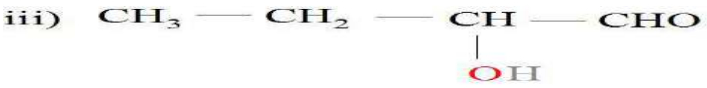
37.a) How will you determine the ionic character in covalent bond using electronegativity values ?

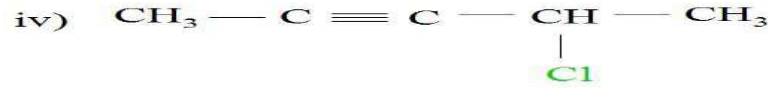
(OR)

b) Give the IUPAC names of the following compounds .

i) 

ii) 

iii) 

iv) 

V) $CH_2 = CH - CH = CH_2$

38.a) How will you prepare the following compounds from benzene ?

i) nitrobenzene ii) benzene sulphonic acid iii) BHC

(OR)

b) Simplest alkene (A) reacts with HCl to form compounds (B) .compounds (B) reacts with ammonia to form compound (C) of molecular formula C_2H_7N. compounds (C) undergoes carbylamines test. Identify (A),(B) and (C)

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Time allowed : 3.00hours **Maximum marks : 70**

July-2022

Part-I

Note : i) Answer all the questions.

ii) choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer

CHOOSE THE BEST ANSWER **15 X 1 = 15**

1. Total number of electrons present in 1.7 g of ammonia is :

a) 6.022×10^{23} b) $\frac{6.022X\ 10^{22}}{1.7}$ c) $\frac{6.022X\ 10^{24}}{1.7}$ d) $\frac{6.022X\ 10^{23}}{1.7}$

2. The total number of orbitals associated with the principle quantum number n=3

a) 9 b) 8 c) 5 d) 7

3.Tritium is a _____ emitter

a) α b) β c) γ d) none of these

4._____ is used in devising photoelectric cells.

a) Lithium b) Sodium c) Potassium d) Caesium

5. Aming the following the least thermally stable is :

a) K_2CO_3 b) Na_2CO_3 c) $BaCO_3$ d) Li_2CO_3

6.If temperature and volume of an ideal gas is increased to twice its values, the initial pressure P becomes :

a) 4P b) 2P c) P d) 3P

7.The amount of heat exchanged with the surrounding at constant pressure is given by the quantity :

a) ΔE b) ΔH c) ΔS d) ΔG

8.If X is the fraction of PCl5 dissociated at equilibrium in the reaction

$PCl_5 \rightleftharpoons PCl_3 + Cl_2$

Then atarting with 0.5 mole of PCl5 , the total number of moles of reactants and products at equilibrium is ;

a) 0.5-X b) X+ 0.5 c) 2X+0.5 d) X+1

9.Which one of the following binary liquid mixtures exhibit positive deviation from Raoult's law ?

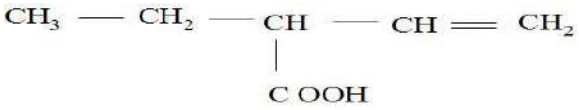
a) Acetone + Chloroform b) Water + Nitric acid

c) HCl + Water d) Ethanol +Water

10.The ratio of number of sigma ( ) and pi (π) bonds in 2-butynal is :

a) $\frac{8}{3}$ b) $\frac{5}{3}$ c) $\frac{8}{2}$ d) $\frac{9}{2}$

11.The IUPAC name of the com,pound



Is

a) 2-ethylbut-2-enoic acid
b) 3-ethylbut-3-enoic acid
c) 3-ethylbut-2-enoic acid
d) 2-ethylbut-3-enoic acid

12.Match the following

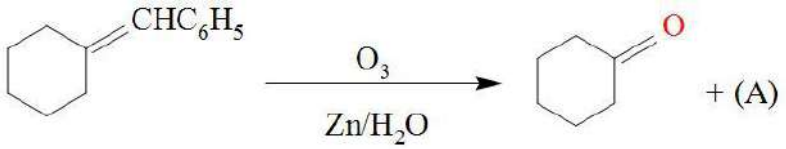
1) -NH2	i) Sulpho-
2) -CN	ii) Formyl -
3) -SO3H	iii) Amino -
4) -CHO	iv) Cyano -

a) 1)- i) , 2)- ii) , 3)- iii), 4)- iv) b) 1)- iv), 2)- iii) , 3)- ii) , 4)- i)
c) 1)- iii) , 2)- iv), 3)- i) , 4)- ii) d) 1)- iii), 2)- i) , 3)- iv), 4)- ii)

13.-I effect is not shown by

a) $-CH_2CH_3$ b) -F c) -Cl d) $-NO_2$

14. Identify the compound (A) in the following reaction :



15. Assertion : Increasing order of boiling points of halo alkanes are

$CH_3Cl < CH_2Cl_2 < CHCl_3 < CCl_4$

Reason : The boiling points of halo alkanes increase with increase in the number of halogen atoms

a) Assertion is true but reason is false
b) both assertion and reason are true and reason is the correct xplanation of assertion
c) Both Assertion and reason are false
d) both assertion and reason are true and reason is not the correct explanation of assertion

PART-II

Answer the following any six questions **6 X 2 = 12**

16.What is meant by limiting reagents ?

17.State Heisenberg"s uncertainty principle

18.Give an example for ionic hydride and covalent hydride.

19.What is path function ? Give two examples .

20.Define reaction quotient

21.50g of tab water contains 20 mg of dissolved solids. What is the TDS val;ue in ppm?

22.How will you prepare ethane by Kolbe"s electrolytic method ?

23.Mention any two methods of preparation of haloalkanes from alcohols.

24.If an automobile engine burns petrol at a temperature of 1089 K and if the surrounding temperature is 294 K , calculate its maximum possible efficiency .

PART-III

Answer the following any six questions **6 X 3 = 18**

25.calculate the empirical formula of a compound containing 76.6% carbon, 6.38%, hydrogen and rest of oxygen.

26.compare the ionisation energy of beryllium and boron

27.Distinguish between diffusion and effusion.

28.At particular temperature $K_c = 4X\ 10^{-2}$ for the reaction

$$H_2S_{(g)} \rightleftharpoons H_{2(g)} + \frac{1}{2} S_{2(g)}$$

Calculate K_c for each of the following reactions.

i) $2H_2S_{(g)} \rightleftharpoons 2H_{2(g)} + S_{2(g)}$

ii) $3H_2S_{(g)} \rightleftharpoons 3H_{2(g)} + \frac{3}{2} S_{2(g)}$

29.What are the conditions when a solution tends to behavelike an ideal solution?

30.Describe fajan's Rule

31.Write short notes on hyper conjugation

32.Explain Brich reduction

33.Give an example for each of the following type of organic compounds

i) Non-benzonoid aromatic compound

ii) Aromatic heterocyclic compound

iii) carbocyclic compound

PART-IV

ANSWER ALL THE QUESTIONS **5 X 5 = 25**

34. a) i) Describe about magnetic quantum number ?

ii) Give the electronic configuration of Mn^{2+} and Cr^{3+}

(OR)

b) i) What are f-block elements ?

ii) State the trends in the variation of electronegativity in group and periods

35. a) Discuss the similarities between lithium and magnesium

(OR)

b) i) Define entropy .Give its unit.

ii) List any three characteristics of gibbs free energy.

36. a) Derive K_C and KP for synthesis of ammonia

(OR)

b) Discuss the formation of C_2 molecule using MO theory

37. a) mention the shape of the following molecules based on VSPER theory

i) BF_3 ii) BrF_3 iii) PCl_5 iv) SF_6 v) IF_7

(OR)

b) Describe any two types of constitutional isomers.

38. a) An organic compound (A) C_2H_4 decolourises bromine water. (A) on reaction with chloride gives (B) . (A) reacts with HBr to give (C) . identify (A), (B) and (C) explain the reactions.

(OR)

b) Starting from CH_3MgI , how will you prepare the following ?

i) Acetaldehyde ii) Acetone iii) Methane

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UNITWISE PUBLIC QUESTIONS

1.Basic Concepts Of Chemistry And Chemical Calculations

ONE MARKS ;-

1.which of the following compound has same percentage of carbon as that of ethylene (C_2H_4) ? (mar 19)

a) benzene b) ethane

c) propene d) ethyne

2.The oxidation number of carbon in CH_2F_2 is _____ (jun19)

a) +4 b) -4

c) 0 d)+2

3.The relative molecular mass of ethanol is ___ (sep20)

a) 0.46g b) 4.6 g

c) 460g **d) 46g**

4. Which one of the following of presents 180g of water ? (sep21)

a) $\frac{6.022 \text{ X } 10^{24}}{180}$ moles of water b) 5 moles of water

c) 6.022 X 10^{24} moles of water d) 90 moles of water

5.Which of the following compound(s) has/have percentage of carbon same as that in ethylene (C_2H_4) ? (sep21)

a) benzene **b) propene** c) ethane d) ethyne

6. Total number of electrons present in 1.7 g of ammonia is : (jul22)

a) 6.022 X 10^{23} b) $\frac{6.022X\ 10^{22}}{1.7}$ c) $\frac{6.022X\ 10^{24}}{1.7}$ d) $\frac{6.022X\ 10^{23}}{1.7}$

2&3&5 MARKS :-

1.Calculate the equivalent mass of H_2SO_4 (mar 19).(ipn : 9)

2. calculate oxidation number of oxygen in H_2O_2 (mar 19). (ipn : 21)

3.A compound having the empirical formula C_6H_6O has the vapour density 47. Find its molecular formula. (mar 19).(b/b-42) (ipn : 247)

4.What do you understand by the term mole ? (jun19)(b/b-27) (ipn : 6)

5.What are auto redox rections ? give an example .(jun19) (ipn : 23)

6.Define basicity.Find the basicity of ortho-phosphoric Acid.(sep20)

Basicity is no. of moles of ionisable H^+ ions present in 1 mole of the acid

ortho-phosphoric Acid H_3PO_4 H_3PO_4 basicity = 3 eq mol^{-1}

7.Calculate the empirical formula and molecular of a compound containing 76.6% carbon,6.38% of hydrogen and rest oxygen. Its vapour density is 47. (sep20) (b/b-42) (ipn : 247)

8.What is the empirical formula of the following ? (sep21)(b/b-38)

a) Fructose ($C_6H_{12}O_6$) ii) Caffeine ($C_8H_{10}N_4O_2$)

9. Distinguish between oxidation and reduction . (sep21) (b/b-30)

10..Define Gram equivalent mass (May22) (b/b-28) (ipn :8)

11.Calculate the oxidation number of underlined elements . (May22)

i) $\underline{C}O_2$ ii) $H_2\underline{S}O_4$

i) $\underline{C}O_2$

$x+2(o) = 0$

$x + 2(-2) = 0$

$x-4 = 0$

$x = +4$

oxidation number of carbon is +4

ii) $H_2\underline{S}O_4$

$2(H)+x +4(o) = 0$

$2(+1)+x +4(-2) = 0$

$2+x -8 = 0$

$x-6 = 0$

$x =+6$

oxidation number of sulfur is +6

12.What is meant by limiting reagents ? (jul22) (ipn : 17)

13.calculate the empirical formula of a compound containing 76.6% carbon, 6.38%, hydrogen and rest of oxygen. (jul22) (b/b-42) (ipn : 247)

2.Quantum Mechanical Model Of Atom

ONE MARKS ;-

1.Splitting of spectral lines in an electric field is called _____ (mar 19)

a) Compton effect **b) stark effect**

c) Zeeman effect d) shielding effect

2.The energy of an electron in the third orbit of hydrogen atom is –E . The energy of an electron in the first orbit will be _____ (jun19)

a) -3E b) $-\frac{E}{3}$ c) $-\frac{E}{9}$ **d) -9E**

3.The maximum number of electrons that can be accommodated in L orbit is _____(sep20)

a) 8 b) 2 c) 4 d) 6

4.Splitting of spectral lines in an electric field is called : (May22)

a) Compton effect b) Zeeman effect

c) Stark effect d) Shielding effect

5. The total number of orbitals associated with the principle quantum number n=3 (jul22)

a) 9 b) 8 c) 5 d) 7

2&3&5 MARKS :-

1.state and explaine pauli's exclusion principle. (mar 19).(b/b-31) (ipn :52)

2. Write the de-broglie equation. (mar 19). (ipn : 40)

3. Define orbital.What are the n and l values for 3px and $4dx^2$-y^2 electron ? (jun19) (b/b-32) (ipn : 44,257)

4. calculate the uncertainty in the position of an electron, if the uncertainty in its velocity is 5.7 x 10^5 ms^{-1} (jun19) (ipn : 43,252)EY :2

5.Calculate the orbital angular momentum for d and f orbital. (jun19) (compulsory 2 mark)

Angular momentum = $\sqrt{l(l+1)}\,\frac{h}{2\pi}$

orbital angular momentum for d

l = 2

$$= \sqrt{2(2+1)}\,\frac{h}{2\pi}$$

$$= \sqrt{6}\,\frac{h}{2\pi}$$

orbital angular momentum for f l=3

$$= \sqrt{3(3+1)}\,\frac{h}{2\pi}$$

$$= \sqrt{12}\,\frac{h}{2\pi}$$

$$= 2\sqrt{3}\,\frac{h}{2\pi}$$

$$= \sqrt{3}\,\frac{h}{2\pi}$$

6.In degenerate orbitals, why do the completely filled and half filled configurations are more stable than the partially filled configurations ? (sep20) (compulsory 2 mark)

The stability of exactly half-filled orbitals in degenerate orbitals is stronger than that of other partially filled configurations. This can be explained using symmetry and the concept of exchange energy . half and completely-filled subshells become more stable because of the symmetrical distriburion of electron.

Reason :-

i) Symmetrical distribution of electron in orbital

ii) Exchange energy

7.State Heisenber's Uncertainty Principle . (sep20) (ipn : 42)

8.Calculate the total number of angular nodes and radial nodes present in 3d and 4f orbitals. (sep20) (b/b-28) (ipn : 257)

9.What is exchange energy ? (sep21) (ipn :56)

10.State Aufbau principle (sep21) (ipn : 52)

11.Write a note on principal quantum number (sep21) (ipn : 44)

12.Calculate the maximum number of electrons that can be accommodated in L shell(May22)

The maximum number of electrons that can be accommodated in a given shell is $2n^2$.

L shell is $n = 2$

$= 2 (2)^2$

$= 8$

maximum number of electrons that can be accommodated in L shell = 8

13.How many orbitals are possible for n=4 ? (May22) (b/b-27)(ipn : 256)

14. Write the electronic configuration and orbital diagram for nitrogen ? (May22) (ipn :54)

15.State Heisenberg"s uncertainty principle (jul22) (ipn : 42)

16. Describe about magnetic quantum number ? (jul22) (ipn : 45)

17.Give the electronic configuration of Mn^{2+} and Cr^{3+} (jul22) (b/b : 39)

Mn^{2+} $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^0\ 3d^5$

Cr^{3+} $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^0\ 3d^3$

3.Periodic Classification Of Elements

ONE MARKS ;-

1.The element with positive electron gain enthalpy is _____ (mar 19)

a) Argon b) Fluorine

c) Hydrogen d) sodium

2.The effective nuclear charge experienced by the d^1 electron in the given electronic configuration, $(1s)^2\ (2s,2p)^8\ (3s,3p)^8\ (3d)^1\ (4s)^2$ is : (jun19)

a) 4 **b) 3** c) 2.1 d) 6.9

3.Assertion : Helium has the highest value of ionisation energy among all the elements known.

Reason : Helium has the highest value of electron affinity among all the elements known. (sep20)

a) Both assertion and reason are false

b) Both assertion and reason are true and the reason is correct explanation for the assertion

c) Both assertion and reason are true but the reason is not the correct explanation for the assertion

d) Assertion is true and reason is false .

2&3&5 MARKS :-

1.Explain diagonal relationship (mar 19) (b/b-41) (ipn : 90)

2.State and explain Dobereiner"s "triad" (mar 19) (ipn :69)

3.Ionisation potential of nitrogen is greater than that of oxygen . explain by giving appropriate reason. (jun19)(b/b-44i) (ipn : 85)

4.Give the general electronic configuration of lanthanides and actinides. (jun19) (b/b-36) (ipn :78)

5.Derive ionic radius using pauling's method . (sep20) (b/b-39) (ipn : 83)

6. Explain why the electron affinity of Be and N is almost zero(sep20) (ipn : 86)

7.Define electronegativity. State the trends in the variation of electronegativity in group and period (sep21) (b/b-47) (ipn :87,88)

8.Define atomic radius. (sep21) (ipn : 79)

9.Explain diagonal relationship (sep21) (ipn : 90)

10.Define electron affinity (May22) (ipn : 86)

11.Describe the pauling method for determination of ionic radius . (May22) (ipn : 83)

12.What are f-block elements ? (jul22) (ipn : 78)

13. State the trends in the variation of electronegativity in group and periods (jul22) (b/b-47) (ipn :87,88)

14. define valency (mar 19) (ipn :88)

15.How will you determine the ionic character in covalent bond using electronegativity values ? (May22)

Pauling estimated the percentage of ionic character in various $A^{\delta-} - B^{\delta+}$ polar covalent bonds from known (X_A–X_B) values and has derived the following conclusions :

(i) When (X_A–X_B) = 1.7, the amount of ionic character in $A^{\delta-} - B^{\delta+}$ bond is 50% and that of covalent character is also 50%. Thus A-B bond is 50% ionic and 50% covalent.

(ii) When (X_A–X_B) < 1.7, the amount of ionic character in $A^{\delta-} - B^{\delta+}$ bond is less than 50% and that of covalent character is more than 50%. Thus $A^{\delta-} - B^{\delta+}$ bond is predominantly covalent and hence is represented as A–B.

(iii) When (X_A–X_B) > 1.7, the amount of ionic character in $A^{\delta-} - B^{\delta+}$ bond is more than 50% and that of covalent character is less than 50%. Hence $A^{\delta-} - B^{\delta+}$ bond is predominantly ionic and hence is represented as $A^- B^+$

16.compare the ionisation energy of beryllium and boron (jul22) (ipn : 85)

4.Hydrogen

ONE MARKS ;-

1.What percentage of solution of H_2O_2 is called as "100-volume' H_2O_2 ? (mar 19)

a) 15% b) 50%

c) 20% **d) 30%**

2.The type of H-bonding present in orthonitro phenol and p-nitro phenol are _____ Respectively. (jun19)

a) Inter molecular H-bonding and intra molecular H-bonding

b) Intra molecular H-bonding and inter molecular H-bonding

c) Intra molecular H-bonding and no H-bonding

d) Intra molecular H-bonding and intra molecular H-bonding

3.Intra molecular hydrogen bonding is present in_____ (sep20)

a) Ortho-nitro phenol b) Ice

c) Water d) Hydrogen fluoride

4.Assertion ; permanent hardness of water is removed by treatment with washing soda

Reasons : Washing soda reacts with soluble calcium and magnesium chloride and sulphate in hard water to form insoluble carbonates. (sep21)

a) Assertion is true but reason is false

b) Both assertion and reason are true and reason is the correct explanation of assertion

c) Both assertion ans reason are false

d)Both assertion and reason are true but reason is the correct explanation of assertion

5.Tritium nucleus contains : (May22)

a) 1p+2n b) 1p+on

c) 1p+1n d) 2p+1n

6.Tritium is a _____ emitter(jul22)

a) α **b) β** c) γ d) none of these

2&3&5 MARKS :-

1.How is Tritium prepared ? (mar 19)(ipn : 104)

2. complete the following equation (ipn : 111)

Na_2O_2 + ?___→ Na_2SO_4+ H_2O_2 (mar 19)

3.What is syn gas ? How it is prepared ? (jun19) (ipn :103)

4.Why hydrogen peroxide is stored in plastic bottle containers not in glass container ? (jun 19) (ipn : 112)

5.Write the exchange reactions of Deuterium. (sep20) (ipn : 105)

6.How do you convert para hydrogen into ortho hydrogen. (sep20) (ipn : 102)

7.Write the laboratory method of preparation of hydrogen . (sep20) (ipn : 103)

8.How do you convert para hydrogen into ortho hydrogen ? (sep21) (ipn : 102)

9.Mention the three types of covalent hydrides . (May22) (ipn : 113)

10.Give an example for ionic hydride and covalent hydride. (jul22) (ipn : 113)

5.Alkali And Alkaline Earth Metals

ONE MARKS ;-

1.Find A in the following reaction $CaO + 3C \xrightarrow{3273K} A + CO$ (mar 19)

a) CaC_2 b) CO_2 c) Ca d) Ca_2O

2. which compound is named as "blue john" among the following compounds ? (mar 19)

a) $Ca_3(PO_4)_2$ b) CaO c) CaH_2 **d) CaF_2**

3.When CaC_2 is heated in atmospheric nitrogen in an electric furnace, the compound formed is _____ (jun19)

a) $Ca(CN)_2$ **b) CaNCN** c) CaC_2N_2 d) $CaNC_2$

4.Formula of Gypsum is _____ (sep20)

a) $CaSO_4$ **b) $CaSO_4.2H_2O$** c) $CaSO_4.\frac{1}{2}H_20$ d) $CaSO_4.H_20$

5.Flame colour of potassium salts in bunsens burner (sep21)

a) Lilac (violet) b) crimson red c) Apple green d) yellow

6. Formula of plaster of paris (sep21)

a) $3CaSO_4.H_2O$ b) $CaSO_4.2H_2O$ c) $2CaSO_4.2H_2O$ **d) $CaSO_4.\frac{1}{2}H_2O$**

7.Spodumene is the mineral source for which of the following alkali metal ? (May22)

a) Lithium b) Sodium c) Rubidium d) Potassium

8.Which of the following has highest hydration energy ? (May22)

a) $BaCl_2$ **b) $MgCl_2$** c) $SrCl_2$ d) $CaCl_2$

9._____ is used in devising photoelectric cells. (jul22)

a) Lithium b) Sodium c) Potassium **d) Caesium**

10. Among the following the least thermally stable is : (jul22)

a) K_2CO_3 b) Na_2CO_3 c) $BaCO_3$ **d) Li_2CO_3**

2&3&5 MARKS :-

1.Explain why $Ca(OH)_2$ is used in white washing . (mar 19) (ipn : 145)

2.Among the alkaline earth metals BeO is insoluble in water but other oxides are soluble .why ? (mar 19) (ipn : 142)

3.Write any two similarities between beryllium and aluminium (jun19). (ipn : 140)

4.Among the alkali metal halides, which is covalent ? explain with reason. (jun19)(ipn:130)

5.why blue colour appears during the dissolution of alkali metals in liquid ammonia (jun19) (ipn : 130)

6.How is bleaching powder prepared ? (sep20) (ipn :145)

7.Write the uses of magnesium. (sep20) (ipn : 141)

8. Discuss the similarities between beryllium and aluminium (sep21) (ipn : 140)

9. What are the reasons for the anomalous properties of Berylium ? (May22) (ipn : 139)

10. Give any three properties of beryllium that are different from other elements of the group (May22) (ipn : 139)

11. Discuss the similarities between lithium and magnesium (jul22) (ipn :129)

6.Gaseous State

ONE MARKS ;-

1.use of hot air ballone in meteorological observatory is an (mar 19) application of_____

a) Kelvin's Law b) Brown's Law

c) Boyle's Law d) Newton's Law

2.When an ideal gas undergoes unrestrained expansion, no cooling occurs because the molecules _____ (jun19)

a) are above the inversion temperature **b) exert no attraction force on each other**

c) do work equal to the loss in kinetic energy d) collide without loss of energy

3.Gases tent to behave ideally only at _____ (sep20)

a) Low temperature and low pressure b) High temperature and High pressure

c) High temperature and low pressure d) Low temperature and High pressure

4. Rate of diffusion of a gas is : (sep21)

a) directly proportional to the square root of its molecular weight

b) directly proportional to its density

c) inversely proportional to the square root of its molecular weight

d) directly proportional to its molecular weight

5.7.5 g of a gas occupies a volume of 5.6 L at 0^0C and 1 atm pressure .The gas is (May22)

a) CO **b) NO** c) CO_2 d) N_2O

6.A bottle ao ammonia and a bottle of HCl connected through a long tube are opened simultaneously at both ends. The white ammonium chloride ring will be first formed : (May22)

a) near the ammonia bottle b) at the centre of the tube

c) throughout the length of the tube **d) near the hydrogen chloride bottle**

7.If temperature and volume of an ideal gas is increased to twice its values, the initial pressure P becomes : (jul22)

a) 4P b) 2P **c) P** d) 3P

2&3&5 MARKS :-

1.what are ideal gas ? (mar 19) (ipn : 169)

2. State Diffusion law. (mar 19) (ipn : 168)

3.What is inversion temperature ? (jun19) (ipn : 175)

4.Derive ideal gas equation. (jun19) (ipn : 165)

5.what is boyle's temperature ? .what happens to real gases above and below the boyle's temperature ? (jun19) (ipn : 171)

6.Write the mathematical formula for compressibility factor 'Z' (sep20) (ipn : 169)

7. Name the different methods of liquefaction of gases. (sep20) (ipn : 175)

8.Inside a certain automobile engine , the volume of air in a cylinder is 0.375 dm^3 , when the pressure is 1.05atm . When the gas is compressed to a volume of 0.125 dm^3 at the same temperature , What is the pressure of the compressed air ? (sep21) (ipn :162-268) (compulsory 3 mark)

9.State Dalton Law of partial pressures. (May22) (ipn : 166)

10.Distinguish between diffusion and effusion. (jul22) (ipn : 168)

7.Thermodynamics

ONE MARKS ;-

1.The SI unit of molar heat capacity is : _____ (mar 19)

a) JK^{-1} mol^{-1} b) KJ mol^{-1} c) Kj mol^{-1} d) cm

2.Among the following statements, which one is /are correct ? (jun19)

i) During cyclic process the amount of heat absorbed by the surrounding is equal to work done on the surrounding

ii)Refractive index is an example for intensive property

iii) If the enthalpy change of a process is positive then the process is spontaneous

iv) The entropy of an isolated system increases during spontaneous process

a) (i), (ii), (iii) b) (i), (iv) **c) (ii), (iv)** d) (ii) only

3.Among the following which is the path function ? (sep20)

a) G b) U c) H **d) q**

4. Heat of combustion is always : (sep21)

a) zero b) positive

c) either positive or negative **d) negative**

5.The intensive property among the quantities below is : (May22)

a) Enthalpy b) mass **c)** $\frac{mass}{volume}$ d) volume

6.The amount of heat exchanged with the surrounding at constant pressure is given by the quantity : (jul22)

a) ΔE **b) ΔH** c) ΔS d) ΔG

2&3&5 MARKS :-

1.state the third law of thermodynamics (mar 19) b/b-42 (ipn : 218)

2.calculate the entropy change during the melting of one mole of ice into water at 0^0c. enthalpy of fusion of ice is 6008 J mol^{-1}. (mar 19) (ipn : 213)

3.$C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$ Calculate the standard entropy change for the above reaction, given the standard entropies of $CO_{2(g)}$, $C_{(s)}$, $O_{2(g)}$ are 213.6,5.740 and 205 jk^{-1} respectively. (mar19) (ipn : 212)

4.Define molar heat capacity. Give its unit. (jun19) b/b-34(ipn : 201)

5. How do you measure heat changes at constant pressure ? (jun19) (ipn : 204)

6.state zeroth Law of Thermodynamics. (sep20) (ipn :195)

7.Distinguish between extensive and intensive property. (sep20) (ipn : 189)

8.Derive the relation between enthalpy ΔH and internal energy ΔU for an ideal gas. (sep20) (ipn : 197)

9. Calculate the entropy change during the melting of one mole of ice into water at 0^0c and 1 atm pressure. Enthalpy of fusion of ice is 6008J mol^{-1} (sep20) (ipn : 213)

10.Define Hess's law of constant heat summation. (sep21) (ipn : 207)

11.Give any two characteristics of gibbs free energy ? (sep21) (b/b-52)

12. State the first law of thermodynamics (sep21) (ipn : 195)

13. What are the conditions for the spontaneity of a process? (sep21) (ipn : 215)

14.What are the condition for the spontaneity of a process (May22) (ipn : 215)

15.Explain sign convention of heat (May22) (ipn : 192)

16. Explain the characteristics of internal energy . (May22) (ipn : 191)

17.What is path function ? Give two examples . (jul22) (ipn : 191)

18.If an automobile engine burns petrol at a temperature of 1089 K and if the surrounding temperature is 294 K , calculate its maximum possible efficiency . (jul22) (ipn : 211) (compulsory 2 mark)

19.Define entropy .Give its unit. (jul22) (ipn : 210,211)

20. List any three characteristics of gibbs free energy. (jul22) (b/b-52)

8.Physical And Chemical Equilibrium

ONE MARKS ;-

1.When Δng is negative in chemical equilibrium reaction then (mar 19)

a) $K_p<K_c$ b) $K_p=1/K_c$ c) $K_p=K_c(RT)^{-ve}$ d) $K_p > K_c$

2.If k_b and k_f for a reversible reaction are 0.8×10^{-5} and 1.6×10^{-4} respectively ,the value of equilibrium constant is _____ (jun19)

a) 20 b) 0.2×10^{-1} c) 0.05 d) 0.2

3.Which of the following is incorrect statement ? (sep20)

a) Equilibrium constant varies with temperature

b) For a system at equilibrium ,Q is always less than the equilibrium constant

c) Equilibrium can be attained from either side of the reaction

d) Presence of catalyst affects both the forward reaction and reverse reaction to the same extent.

4. For the following reversible rections at equilibrium A + B $\rightleftharpoons$ C. If the concentration of the reactants A and B are doubled, then the equilibrium constant will : (sep21)

a) be halved b) be doubled

c) remain the same d) become one fourth

5. Which one of the following is incorrect statement ?(may22)

a) Presence of catalyst affects both the forward reaction and reverse reaction to the same extent.

b) for a system at equilibrium Q is always less than the equilibrium constant

c) equilibrium constant varies with temperature

d) equilibrium can be attained from either side of the reaction

6.If X is the fraction of PCl5 dissociated at equilibrium in the reaction

$$PCl_5 \rightleftharpoons PCl_3 + Cl_2$$

Then Starting with 0.5 mole of PCl5 , the total number of moles of reactants and products at equilibrium is ; (jul22)

a) 0.5-X **b) X+ 0.5** c) 2X+0.5 d) X+1

2&3&5 MARKS :-

1.Define –Le-Chatelier principle. (mar 19) b/b-32(ipn : 16)

2.Write the balanced chemical equation for the $K_c = \frac{[CaO_{(S)}][CO_{2(g)}]}{[CaCO_{3(g)}]}$ (mar 19) (ipn : 8)

$$CaCO_3 \rightleftharpoons CaO + CO_2$$

3.What is the effect of added inert gas on the rection at equilibrium ? (jun19)b/b-38(ipn :19)

4.Derive the relation between kp and kc for a general homogeneous gaseous reaction.

(jun19)b/b-39 (ipn :6)

5.Explain homogeneous and heterogeneous equilibria. (sep20) (ipn : 5)

6. Define reaction quotient. (sep20) (ipn : 11)

7.What is the relation between K_P and K_C ? Give one example for which K_P is equal to K_C. (sep21) b/b- 28(ipn : 7)

8.What are homogeneous and heterogeneous equilibria? Give example (sep21) (ipn :5)

9.Give a balanced chemical equation for the equilibrium reaction for which the equilibrium constant is given by expression Kc = $\frac{[NH_3]^4[O_2]^5}{[NO]^4[H_2O]^6}$ (May22) b/b-37 (ipn : 295)

$$4NO + 6H_2O \rightleftharpoons 4NH_3 + 5O_2$$

10.The equilibnrium concentrations of NH_3 and N_2 and H_2 are 1.8 x10^{-2}M , 1.2x10^{-2}M and 3x 10^{-2} M respectively. Calculate the equilibrium constant for the formation of NH_3 from N_2 and H_2 (May22) (ipn :15) (compulsory 3 mark)

11.Define reaction quotient (jul22) (ipn : 11)

12.At particular temperature K_c = 4X 10^{-2} for the reaction (jul22) (b/b-44) (ipn : 295)

$$H_2S_{(g)} \rightleftharpoons H_{2(g)} + \frac{1}{2} S_{2(g)}$$

Calculate K_c for each of the following reactions.

i) $2H_2S_{(g)} \rightleftharpoons 2H_{2(g)} + S_{2(g)}$

ii) $3H_2S_{(g)} \rightleftharpoons 3H_{2(g)} + \frac{3}{2} S_{2(g)}$

13. Derive KC and KP for synthesis of ammonia (jul22) (ipn : 14)

9.Solutions

ONE MARKS ;-

1.osmotic pressure (π) of a solution is given by the relation __ (mar 19)

a) π rt=n
b) V= π nRT
c) π= n RT
d) π V=nRT

2.Assertion : Mixture of carbon tetrachloride and chloroform show positive deviation from raoult's law

Reason : In the mixture the inter molecular force of attraction between chloroform and carbon tetrachloride is weaker than those between molecules of carbon tetrachloride and chloroform molecules. (jun19)

a) Both assertion and reason are correct and reason is the correct explanation of assertion

b) Both assertion and reason are correct and reason is not the correct explaination for assertion

c) Both assertion and reason are false

d) Assertion is true , but reason is false

3.osmotic pressure (π) of a solution is given by the relation (sep20)

a) π RT=n
b) π= n RT
c) π V=nRT
d) None of these

4.The molality of a solution containing 1.8g of glucose dissolved in 250g of water is (sep21)

a) 0.02M
b) 0.2M
c) 0.04M
d) 0.01M

5.Equimolal aqueous solutions of NaCl and KCl are prepared . If the freezing point of NaCl is -2^0c , the freezing point of KCl solution is expected to be (May22)

a) -1^0C
b) -2^0C
c) 0^0C
d) -4^0C

6.Which one of the following binary liquid mixtures exhibit positive deviation from Raoult's law ? (jul22)

a) Acetone + Chloroform
b) Water + Nitric acid
c) HCl + Water
d) Ethanol +Water

2&3&5 MARKS :-

1.State the term "isotonic solution" (mar 19)(b/b-37) (ipn : 56)

2. NH_3 and HCl do not obey Hentry's law. Why ? (mar 19) (ipn : 40)

3.What is vapour pressure of a liquid ? what is relative lowering of vapour pressure ?(jun19) (b/b-32)

4.What is the mass of glucose ($C_6H_{12}O_6$) in it one litre solution which is isotonic with 6gl-1 of urea (NH_2CONH_2) ? (jun19) (ipn : 57,299)ey-13

5. Draw and explain the graph obtained by plotting solubility versus temperature for calcium chloride . (jun19) (ipn : 37)

6.Calculate the mole fraction of methanol and water when 0.5 mole of methanol is mixed with 1.5 moles of water. (ipn : 33) (SEP20)

7.What is van't hoff factor 'i' ? (sep20) (ipn : 58)

8.What is molal depression constant ? (sep21) (ipn : 54)

9.What are ideal solutions ? Give example (sep21) (ipn :46)

10.How will you determine the molar mass of a solute from osmotic pressure ? (sep21)(ipn:56)

11.Define the term "isotonic" solution . (May22) b/b-37(ipn :56)

12.Write the formula to calculate the molar mass of a solute from realative lowering of vapour pressure values. (May22) (ipn : 50)

13. How will you determine the molar mass of solute from elevation of boiling point ? (May22) (ipn :53)

14.50g of tab water contains 20 mg of dissolved solids. What is the TDS val;ue in ppm? (jul22) (ipn :34)

15.What are the conditions when a solution tends to be have like an ideal solution? (jul22) (ipn : 46)

10.Chemical Bonding

ONE MARKS ;-

1.which of the following molecule does not contain π bond ? (mar 19)

a) CO_2 **b) H_2O**

c) SO2 d) NO2

2.Shape and hybridation of IF_5 are : (jun19)

a) Trigonal bipyramidal sp^3d^2 b) Trigonal bipyramidal sp^3d

c) Square pyramidal sp^3d^2 d) Octahedral, sp^3d^2

3.Match the following (sep21)

1) N_2 molecule	i) chemical bond
2) BF_3 molecule	ii) Trible covalent bond
3) HF molecule	iii) Electron deficient molecule
4) NaCl	iv) polar covalent bond

a) 1)- iii) , 2)- i) , 3)-iv) , 4)- ii) b) 1)-ii) , 2)- iv) , 3)-i) , 4)- iii)

c) 1)- i) , 2)- iv) , 3)- ii) , 4)- iii) **d) 1)- ii) , 2)-iii) , 3)- iv) , 4)- i)**

4.Which one of the following is diamagnetic ? (May22)

a) O_2^{2-} b) O_2^{+}

c) O_2 d) None of these

5.The ratio of number of sigma (σ) and pi (π) bonds in 2-butynal is : (jul22)

a) $\frac{8}{3}$ b) $\frac{5}{3}$ c) $\frac{8}{2}$ d) $\frac{9}{2}$

2&3&5 MARKS :-

1.what is called bond length ? name the techniques through which the length of a bond can be determined . (mar 19) (ipn ; 76)

2. Write the structure of the following compounds. (mar 19) (ipn ; 82,83)

A) NH_3 B) BF_3

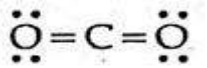
3.Both C_2H_2 and CO_2 have the same structure. Explain why. (MAR19)

- C_2H_2 and CO_2 has sp hybridisation linear structure
- The linear structure of ethyne and that of carbon dioxide is explained on the basis of hybridisation.
- Ethyne molecule is formed when both the carbon atoms undergo sp hybrisation and have two unhybridised orbitals (2py and 2px)

4.Linear form carbon dioxide molecules has two polar bonds .yet the molecule has zero dipole moment. Why ? (jun19) b/b-40 (ipn ; 80)

5.Draw the M.O diagram for oxygen molecule . calculate its bond order and magnetic character. (jun19) (ipn ; 100)

6.Calculate the formal charge on carbon and oxygen for the following structure

 (jun19) (ipn : 72)

7.Write the shape and molecular geomentry for BF_3 (sep20) (ipn : 91)

8.What is hybridisation ? mention the type of hybridization found in CH_4 (sep20) (ipn : 92)

9.Write any four postulates of molecular orbital theory. (sep20) (ipn : 97)

10.Give the shapes of molecules predicted by VSEPR theory (sep21) (ipn :82,83,83)

a) $BeCl_2$ b) NH_3 c) H_2O

11.Define Bond Order. (sep21) (ipn : 76)

12.What are the salient features of VB theory ? (sep21) (ipn : 86)

13.Explain the formation of H_2 molecule using MO-theory (sep21) (ipn : 99)

14.What is resonance ? (sep21) (ipn :78)

15.Describe the formation of HF molecule by orbital overlap. (May22) (ipn :88)

16.Define i) Bond length ii)Bond angle iii)Bond enthalpy . (May22) (ipn : 76,77)

17.Describe fajan's Rule (jul22) (ipn : 81)

18. Discuss the formation of C_2 molecule using MO theory (jul22) (ipn : 100)

19.mention the shape of the following molecules based on VSPER theory (jul22)

i) BF_3 ii) BrF_3 iii) PCl_5 iv) SF_6 v) IF_7 (ipn : 82,83,83,84,84)

11.Fundamentals Of Organic Chemistry

ONE MARKS ;-

1.many of the organic compounds are inflammable because of Its_____ (mar 19)

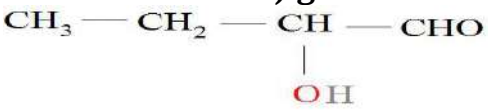
a) vander waal's force b) co-ordinate nature

c) covalent nature d) ionic nature

2.Which of the following is optically active ? (jun19)

a) 3-chlolro pentane b) 2-chloro propane

c) meso-tartaric acid **d) glucose**

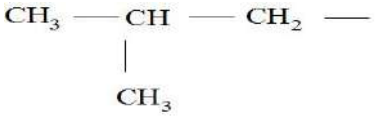


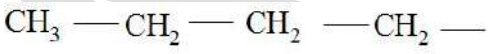
3.Write the IUPAC name of (sep20)

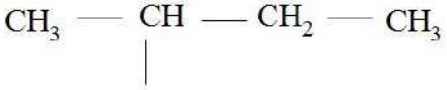
a) 1-formyl propanol b) 1-hydroxy butanal

c) 2-hydroxy butanal d) 3- hydroxyl butanal

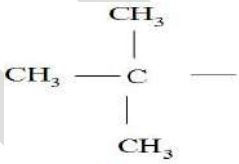
4.The structure of isobutyl group in organic compound (sep21)

a) 

b) 



c)



d)

5.Which of the following is optically active ? (sep21)

a) meso-tartaric acid b) 3-chloropentane

c) glucose d) 2-chloropropane

6.Which of the following is aliphatic saturated hydrocarbon ? (May22)

a) C_9H_{18} b) C_8H_{14} **c) C_8H_{18}** d) All of the above

7.match of following (May22)

1) $-NO_2$ i) propyl

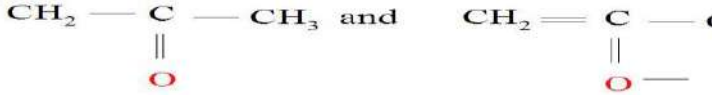
2)$-OCH_3$ ii) Amino

3)$-CH_2-CH_2-CH_3$ iii)Methoxy

4) $-NH_2$ iv) Nitro

a) (1)- (iii), (2)-(ii) , (3)-(iv), (4)-(i) b) (1)- (iii), (2)-(iv) , (3)-(i), (4)-(ii)

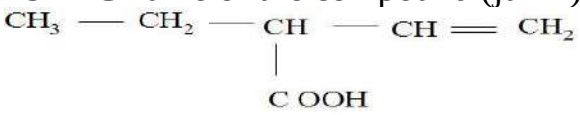
c) (1)- (iv), (2)-(iii) , (3)-(i), (4)-(ii) d) (1)- (ii), (2)-(i) , (3)-(iv), (4)-(iii)

8.  are (May22)

a) optical isomers b) resonating structures

c) conformers **d)tautomers**

9.The IUPAC name of the compound (jul22)



Is

a) 2-ethylbut-2-enoic acid b) 3-ethylbut-3-enoic acid

c) 3-ethylbut-2-enoic acid **d) 2-ethylbut-3-enoic acid**

10.Match the following (jul22)

1) -NH2	i) Sulpho-
2) -CN	ii) Formyl -
3) -SO3H	iii) Amino -
4) -CHO	iv) Cyano -

a) 1)- i) , 2)- ii), 3)- iii , 4)- iv) b) 1)- iv , 2)- iii) , 3)- ii) , 4)- i)

c) 1)- iii), 2)- iv), 3)- i) , 4)- ii) d) 1)- iii), 2)- i) , 3)- iv) , 4)- ii)

2&3&5 MARKS :-

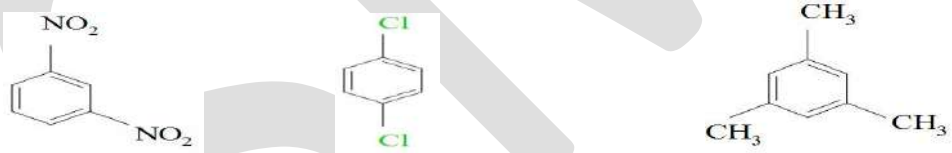
1.Describe the reaction involved in the detection of nitrogen in an organic compound by lassaigne method. (mar 19) (ipn : 138)

2.which is the suitable method for detection of nitrogen present in food and fertilizers? (compulsory 2 mark) (mar 19) (ipn :147)

This method is carried much more easily than the Dumas method. It is used largely in the analysis of foods and fertilizers. Kjeldahls method is based on the fact that when an organic compound containing nitrogen is heated with Conc. H_2SO_4, the nitrogen in it is quantitatively converted to ammonium sulphate.

3.Give the structural formula for the following compounds. (mar 19) (compulsory 3 mark)

a)m-dinitrobenzene b)p-dichlorobenzene c)1,3,5,Tri-methyl Benzene

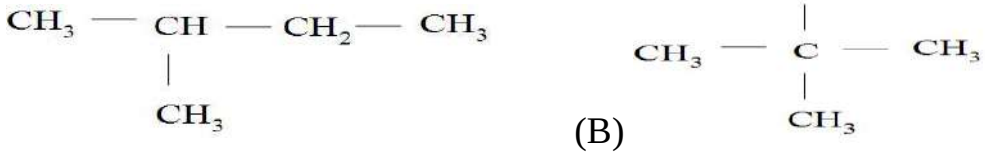


4.Identify the cis and trans isomers for the following compounds (mar 19)

a) b)

TRANS **CIS**

5.Write the IUPAC names for the following compounds. (mar 19)



(A) 2-methyl butane (B) 2,2-dimethyl propane

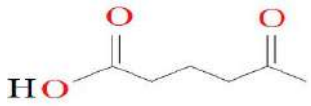
6. Write any two different components you get during fractional distillation of coal tar at any two different temperatures. (mar 19)

S.NO	Name of the fraction	Temperature range	Name of the components
1	Crude tight oil	350-443k	Benzene, toluene,xylene
2	Middle oil	443-503k	Phenol,naphthalene
3	Heavy oil	503-543k	Napththalene,cresol
4	Green oil	543-633k	Antharacene
5	Pitch	Alone 633k	residue

7.How do you detect the presence of nitrogen and sulphur together in an organic compounds ? (jun19) (ipn : 139)

8.explain a suitable method for purifying and separating liquids present in a mixture having very close boiling point. (jun19) (ipn : 150) **(fractional distillation)**

9. Write the IUPAC names for the following compounds : (jun19)

(x) 

5-oxohexanoic acid

(Y) 

4-chloro pent-2-yne

(Y) 

2-ethoxy propane

10.Explain geometrical isomerism in 2-butene. (sep20) (ipn :135) (compulsory 3 mark)

11. Explain the purification of a solid organic compound by crystallization method (sep20) (ipn : 149)

12.Give the general formula for the following class of organic compounds (sep21)

a) Alkanes b) Alkenes c) Alkynes

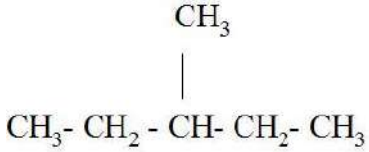
C_nH_{2n+2} **C_nH_{2n}** **C_nH_{2n-2}**

13.What is meant by homologous series ? (sep21) (ipn : 112)

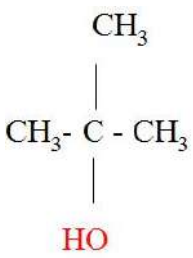
14.Give the structure for the following compounds . (sep21)

1) 3-methylpentane
2) 2-methylpropan-2-ol
3) Propanone

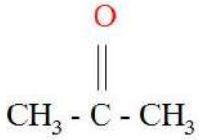
3-methylpentane



2-methylpropan-2-ol

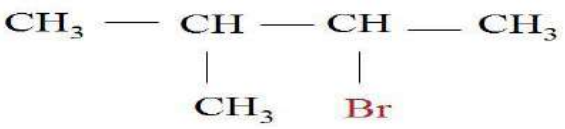


Propanone



15.What is meant by optical isomerism ? (May22) (ipn : 137)

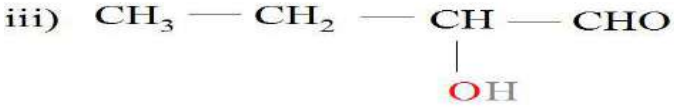
16.Give the IUPAC names of the following compounds . (May22)

i) 

2-bromo-3-methylbutane

ii) 

methoxymethane

iii) 

2-hydroxybutanal

iv) 

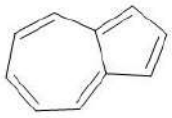
4-chloropent-2-yne

v) $CH_2 = CH - CH = CH_2$ 1,3-butadiene

17.Which element exhibits maximum catenation and why ? (ipn : 110)

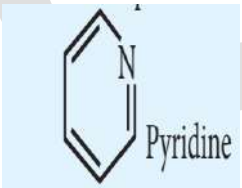
18.Give an example for each of the following type of organic compounds (jul22) (compulsory 3 mark)

i) Non-benzonoid aromatic compound



azulene

ii) Aromatic heterocyclic compound



iii) carbocyclic compound

cyclopropane

19. Describe any two types of constitutional isomers. (jul22) (ipn : 132)

12.Basic Concepts Of Organic Reactions

ONE MARKS ;-

1.Which of the following species does not exert a resonance effect ? (mar 19)

a) $C_6H_5NH_2$ **b) $C_6H_5NH_3^+$** c) C_6H_5OH d) C_6H_5Cl

2.Which of the following species is not electrophile in nature ? (jun19)

a) Cl^+ b) BH_3 **c) H_3O^+** d) $^+NO_2$

3.Which of the following is electron deficient ? (sep20)

a) NH_3 b) PH_3 c) $(CH_3)_2$ **d) BH_3**

4.The geometrical shape of carbocation is (sep21)

a) planar b) linear c) pyramidal d) tetrahedral

5.The correct relative order of +I effect of alkyl groups is : (May22)

a) $-C(CH_3)_3 > -CH(CH_3)_2 > -CH_2CH_3 > -CH_3$ b) $-CH_3 > -CH_2CH_3 > -CH(CH_3)_2 > -C(CH_3)_3$

c) $-CH_2CH_3 > -CH_3 > -C(CH_3)_3 > -CH(CH_3)_2$ d) $-CH(CH_3)_2 > -C(CH_3)_3 > -CH_2CH_3 > -CH_3$

6.-I effect is not shown by (jul22)

a) $-CH_2CH_3$ b) -F c) -Cl d) $-NO_2$

2&3&5 MARKS :-

1. Explain with example the positive mesometric effect. (mar 19) (ipn : 169)

2. What are nucleophiles and electrophiles ? give one example each (mar 19) (ipn : 164)

3. $R-C\equiv N \xrightarrow{H_2O/H^+} (A) \xrightarrow{H2O/H+} (B)$ (mar 19) (ipn : 174)

A= R - C(=O) - NH_2 B = R - C(=O) - O - H

Amide carboxylic acid

4.The bond length between all the four carbon atoms is same in 1,3-butadiene. Explain (compulsory 3 mark) (jun19) (ipn : 168)

1,3-butadiene is a conjugated molecule with four overlapping p-orbital on adjacent atoms,and a electrons are delocalised over four atoms. This shortens the bond length of central c bond thus, the bond length between all the four-c- atoms are same in 1,3-butadiene

5. explain about inductive effect . (jun19) (ipn : 166)

6.Write the no bond resonance structure shown by propene (sep20) (ipn : 170)

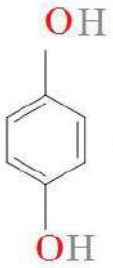
7.Give any three differences between nucleophiles and electrophiles. (May22) (ipn : 164)

8. complete (ipn : 173,173,173,173)

A)  $\xrightarrow{Pt/H_2}$ (sep20)

B) $H_2C{=}CH_2 + H\text{-}Br \xrightarrow{\text{Benzoyl peroxide}}$

C) $CH_3CHO \xrightarrow{\text{Acid dichromate}}$

D)  $\xrightarrow[H_2SO_4]{K_2Cr_2O_7}$

9.Write short notes on hyper conjugation (jul22) (ipn : 170)

13.Hydrocrbons

ONE MARKS ;-

1._____group is ortho para directing and deactivating group (jun19)

a) amino b) methyl

c) halogen d) aldehyde

2.Cold dilute alkaline $KMnO_4$ is known as _____ (sep20)

a) Schiff"s reagent b) Fenton"s reagent

c) Tollen's reagent **d) Baeyer's reagent**

3.n-propyl bromide on rection with alcoholic KOH gives (sep20)

a) Butyl alcohol **b) Propene**

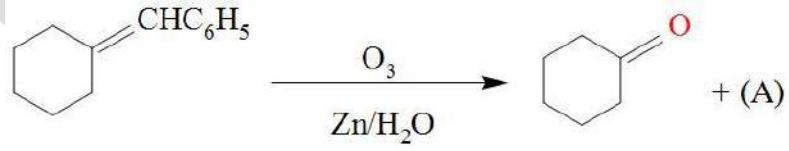
c) Butene d) Propyl alcohol

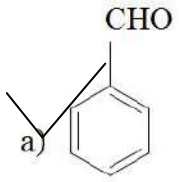
4.An alkene is obtained by decarboxylation of sodium propionate.same alkene can be prepared by : (sep21)

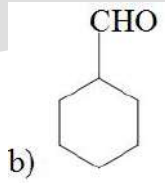
a) reduction of 1-chloro propane b) catalytic hydrogenation of propene

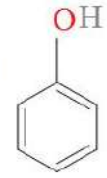
c) reduction of bromo methane **d) action of sodium metal on iodomethane**

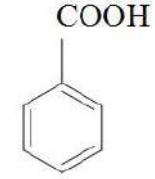
5. Identify the compound (A) in the following reaction : (jul22)



a) 

b) 

c) 

d) 

2&3&5 MARKS :-

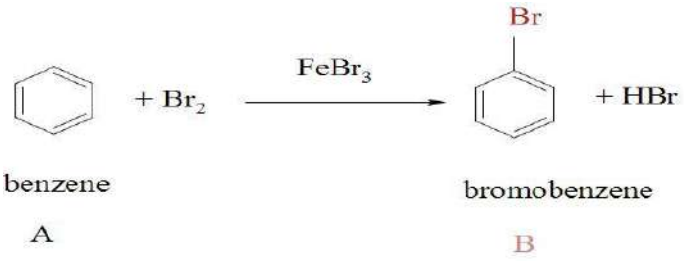
1.How will you get the following products with the given reactants ? (mar 19)

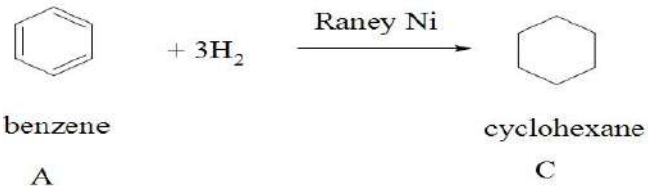
A)Acetylene → Benzene (ipn :204)

B)Phenol → Benzene (ipn : 210)

C)Benzene→ Tolune (ipn : 210)

2.The simple aromatic hydrocarbon compound (A) reacts with bromine to give (B). compound (A) reacts with Raney Ni and gives (C). Identify (A) , (B) and (C).(MAR19)





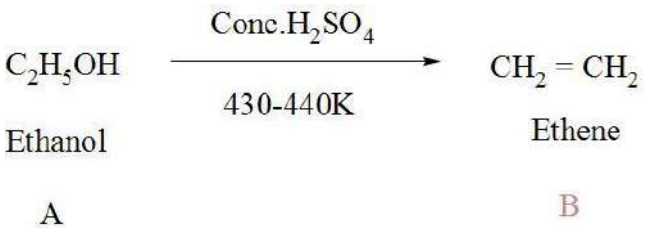
S.NO	COMPOUNDS	FORMULA	NAME
1	A	C_6H_6	Benzene
2	B	C_6H_5-Br	bromobenzene
3	C	C_6H_{12}	cyclohexane

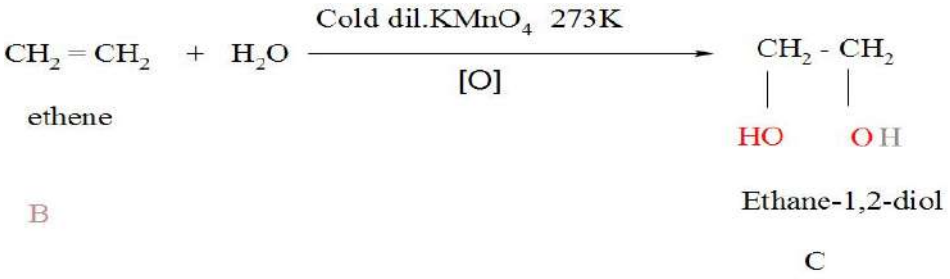
3.What happens when acetylene undergoes ozonolysis ? (jun19) (ipn : 203)

4.What is polymerisation ? explain the two types of polymerisation rection of acetylene . (jun19) (ipn : 204)

5. What do you mean by conformation ? Explain about staggered conformation in ethane . (jun19) (ipn : 187)

6. An organic compound (A) of molecular formula C_2H_6O, on heating with conc.H_2SO_4 gives compound (B) . (B) on treating with cold dilute alkaline $KMnO_4$ gives compound . Identify (A), (B) and (C) and explain the reactions.(JUN19)





S.NO	COMPOUNDS	FORMULA	NAME
1	A	C_2H_5OH	Ethanol
2	B	$CH_2 = CH_2$	Ethene
3	C	$HO\text{-}CH_2\text{-}CH_2\text{-}OH$	Ethane-1,2-diol

7.Explain the different types of polymerisation in ethyne. (sep20) (ipn : 204)

8. write Brich reduction . (sep20) (ipn : 215)

9.Complete the following : (sep21) (compulsory 2 mark)

a) $CH_3\text{-}CH{=}CH_2 + H_2 \xrightarrow{Pt} CH_3\text{-}CH_2\text{-}CH_3$

Propane

b) $CH_3MgCl + H_2O \longrightarrow CH_4 + Mg(OH)Cl$

methane

10.Suggest a simple chemical test to distinguish propane and propene (sep21) (b/b-39)

11.How does Huckel rule help to decide the aromatic character of a compound?

(sep21)(ipn : 205)

12.Write the rection for conversion of acetylene to benzene. (sep21) (ipn : 210)

13.How will you convert ethyl chloride to ethane ? (May22)

$CH_3\text{-}CH_2\text{-}Cl \xrightarrow{Zn/HCl\ [H]} CH_3\text{-}CH_3 + HCl$

ethyl chloride — ethane

14.what happens when ethylene is passed through cold dilute alkaline potassium permanganate ? (May22) (ipn : 198)

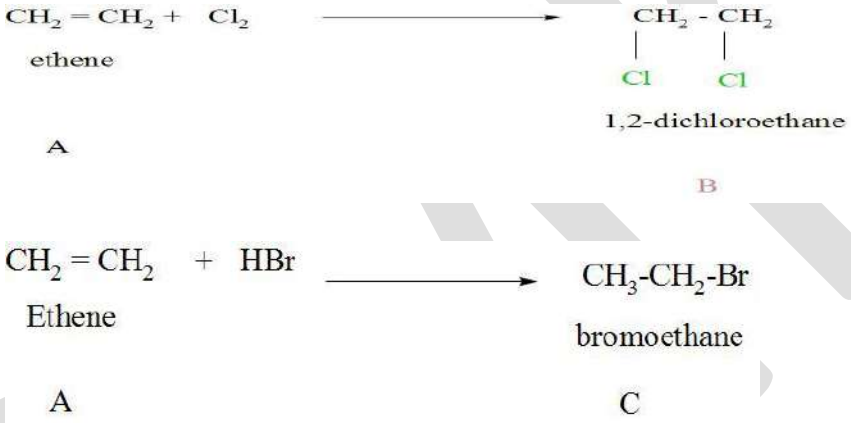
15. How will you prepare the following compounds from benzene ? (May22) (ipn : 211,212,215)

i)nitrobenzene ii)benzene sulphuric acid iii)BHC

16.How will you prepare ethane by Kolbe"s electrolytic method ? (jul22) (ipn :201)

17.Explain Brich reduction (jul22) (ipn : 215)

18. An organic compound (A) C2H4 decolourises bromine water. (A) on reaction with chloride gives (B) . (A) reacts with HBr to give (C) . identify (A), (B) and (C) explain the reactions. (jul22)



S.NO	COMPOUNDS	FORMULA	NAME
1	A	$CH_2 = CH_2$	Ethene
2	B	$Cl\text{-}CH_2\text{-}CH_2\text{-}Cl$	1,2-dichloroethane
3	C	$CH_3\text{-}CH_2\text{-}Br$	bromoethane

14.Haloalkanes And Haloarenes

ONE MARKS ;-

1.match the following (mar 19)

Compound	**uses**
1)Chloro picrin	i) detection of primary amine
2)Methyl isocyanide	ii) DDT
3)Chlolro benzene	iii) paint remover
4)Meythylene chlorine	iv) soil sterilizer

a) (1)- (iv), (2)-(iii) , (3)-(ii), (4)-(i) b) (1)- (iii), (2)-(iv) , (3)-(ii), (4)-(i)

c) (1)- (i), (2)-(ii) , (3)-(iv), (4)-(iii) **d) (1)- (iv), (2)-(i) , (3)-(ii), (4)-(iii)**

2.The raw material for rasching process is _____ (jun19)

a) chloro benzene b) phenol **c) benzene** d) anisole

3. match the following (sep20)

1)Iodoform	i) Fire extinguisher
2)Carbon tetrachloride	ii)Insecticide
3)CFC	iii) Antiseptic
4)DDT	iv)Refrigerants

a) (1)- (iii), (2)-(i) , (3)-(iv), (4)-(ii) b) (1)- (ii), (2)-(iv) , (3)-(i), (4)-(iii)

c) (1)- (iii), (2)-(ii) , (3)-(iv), (4)-(i) d) (1)- (i), (2)-(ii) , (3)-(iii), (4)-(iv)

4.Of the following compounds , which has the highest boiling point? (sep21)

a) t-butyl chloride **b) n-butyl chloride**

c) n-propyl chloride d) Isobutyl chloride

5.Assertion : In monohaloarenes, electrophilic substitution occurs at ortho and para positions

Reason : Halogen atom is a ring deactivator (May22)

a) Assertion is true but reson is false

b) Both assertion and reason are true and reason is the correct explation of assertion

c) Both assertion and reason are false

d) Both assertion and reason are true but reason is not the correct explanation of assertion

6. Assertion : Increasing order of boiling points of halo alkanes are

$CH_3Cl < CH_2Cl_2 < CHCl_3 < CCl_4$

Reason : The boiling points of halo alkanes increase with increase in the number of halogen atoms (jul22)

a) Assertion is true but reason is false

b) both assertion and reason are true and reason is the correct explanation of assertion

c) Both Assertion and reason are false

d) both assertion and reason are true and reason is not the correct explanation of assertion

2&3&5 MARKS :-

1.how is alkane prepared from Grignard reagent ? (mar 19)(ipn : 241)

2.Write note on Williamson's synthesis. (mar 19) (ipn : 234)

3. Among the following compounds ,o-dichloro benzene and p-dichloro benzene , which has higher melting point ? explain with reason . (jun19) (b/b-41(ii)

4.Give the structure and uses of DDT . (sep20) (ipn : 250)

5.explain the mechanism involved in the elimination reaction of tertiary butyl chloride with alcoholic KOH. (sep20) (ipn : 237)

6. Simplest alkene (A) rects with HBr to form compound (B). Compound (B) reacts with ammonia to from compound (C) of molecular formula C_2H_7N. Compound (C) undergoes carbylamines test. Identify (A), (B) and (C). (sep21) (lesson 13& 14)

$$\underset{\text{Ethene}}{CH_2 = CH_2} + HBr \longrightarrow \underset{\text{bromoethane}}{CH_3\text{-}CH_2\text{-}Br}$$

A B

$$\underset{\text{Bromo ethane}}{CH_3\text{-}CH_2\text{-}Br} + NH_3 \longrightarrow \underset{\text{ethyl amine}}{CH_3\text{-}CH_2\text{-}NH_2} + HBr$$

B C

S.NO	COMPOUNDS	FORMULA	NAME
1	A	$CH_2 = CH_2$	Ethene
2	B	$CH_3\text{-}CH_2\text{-}Br$	Bromoethane
3	C	$CH_3\text{-}CH_2\text{-}NH_2$	Ethylamine

7.Write short notes on Swarts reaction ? (sep21) (ipn : 231)

8.Complete the following reactions . (May22) (ipn : 243,244) (compulsory 2 mark)

i) $C_6H_5Cl + 2NH_3 \xrightarrow[50\ atm]{250^0C}$

ii) $C_6H_5Cl + 2Na + Cl\text{-}C_6H_5 \xrightarrow[\Delta]{Ether}$

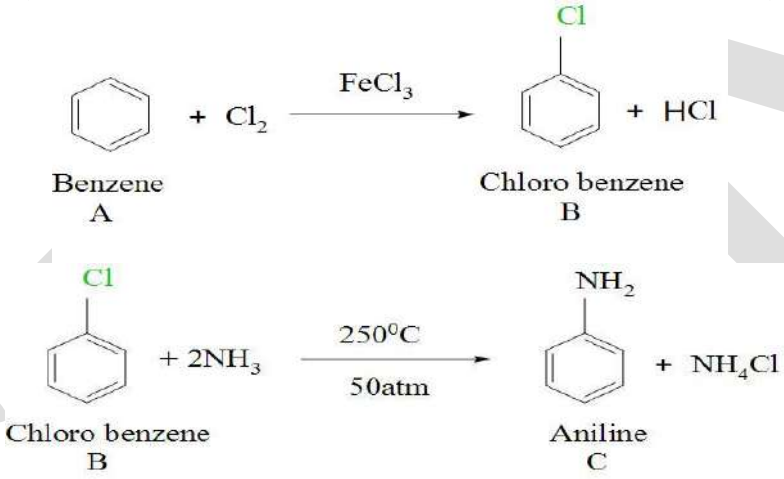
9.Simlest alkene (A) reacts with HCl to form compounds (B) .compounds (B) reacts with ammonia to form compound (C) of molecular formula C_2H_7N compounds (C) undergoes carbylamines test. Identify (A),(B) and (C). (May22)

$$\underset{\text{ethene}}{CH_2 = CH_2} + HCl \xrightarrow{dry} \underset{\text{chloro ethane}}{CH_3\text{-}CH_2\text{-}Cl}$$

A B

S.NO	COMPOUNDS	FORMULA	NAME
1	A	$CH_2 = CH_2$	Ethene
2	B	CH_3-CH_2-Cl	chloroethane
3	C	CH_3-CH_2-NH_2	Ethan amine

10. A simple aromatic hydrocarbon (A) reacts with chlorine to give compound (B) . compound (B) reacts with ammonia to give compound (C) which undergoes carbylamines reaction. Identify (A), (B) and (C) and explain the rteactions. (jun19)



S.NO	COMPOUNDS	FORMULA	NAME
1	A	C_6H_6	Benzene
2	B	C_6H_5-Cl	chlorobenzene
3	C	C_6H_5-NH_2	aniline

11.Mention any two methods of preparation of haloalkanes from alcohols. (jul22)
(ipn : 230,231)

12. Starting from CH_3MgI , how will you prepare the following ? (jul22)
i) Acetaldehyde ii) Acetone iii) Methane (ipn : 240,240,241)

15.Environmental Chemistry

ONE MARKS ;-

1.what is the pH of rain water_____ (mar 19)

a) 5.6 b) 4.6

c) 6.5 d) 7.5

2._____ cause kidney damage (jun19)

a) Cadmium , mercury **b) Lead, Cadmium**

c) Freon, Fluoride d) copper, Cadmium

3.Ozone deplection will cause (sep20)

a) Global warning b) Forest fire

c) Eutrophication **d) Bio-magnification**

2&3&5 MARKS :-

1.define- acid rain (mar 19) (ipn :264)

2.What is green chemistry ? (jun19) (ipn : 275)

3.Write notes on the adverse effect caused by ozone depletion. (jun19) (ipn : 269)

4.What is green house effect ? Name the gases that cause green house effect (sep20) (ipn:263)

5.Write any three strategies to control environment pollution. (sep20) (ipn : 274)

"Life is nothing without chemistry

All are made up of atoms and molecules"

May be any comments

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YOUR HINTS