CHEMISTRY
CLASS XII

BLUE PRINT

	CHAPTERS	V.S.A(1)	S.A(2)	S.A(3)	L.A(5)	TOTAL
1	ATOMIC STRUCTURE	NIL	2(1)	3(1)	NIL	5
2	SOLID STATE	1(1)	NIL	3(1)	NIL	4
3	SOLUTIONS	1(1)	NIL	3(1)	NIL	4
4	THERMODYNAMICS	NIL	2(1)	3(1)	NIL	5
5	ELECTROCHEMISTRY	NIL	NIL	NIL	5(1)	5
6	CHEMICAL KINETICS	1(1)	NIL	3(1)	NIL	4
7	SURFACE CHEMISTRY	NIL	NIL	3(1)		3
8	p-BLOCK ELEMENTS	NIL	2(1)	NIL	5(1)	7
9	d- BLOCK ELEMENTS	NIL	NIL	NIL	5(1)	5
10	COORDINATION COMPOUNDS	NIL	NIL	3(1)	NIL	3
11	NUCLEAR CHEMISTRY	NIL	NIL	3(1)	NIL	3
12	STEREOCHEMISTRY	NIL	2(1)	NIL	NIL	2
13	ORGANIC COMPOUNDS CONTAINING OXYGEN-I	NIL	2(1)	NIL	NIL	2
14	ORGANIC COMPOUNDS CONTAINING OXYGEN-II	1(1)	NIL	3(1)	NIL	4
15	COMPOUNDS CONTAINING NITROGEN	1(1)	NIL	3(1)	NIL	4
16	POLYMERS	NIL	2(1)	NIL	NIL	2
17	BIOMOLECULES	NIL	2(1)	3(1)	NIL	5
18	CHEMISTRY IN EVERYDAYLIFE	NIL	NIL	3(1)	NIL	3
	TOTAL	5	14	36	15	70

1 What is piezoelectricity? Give one example of piezoelectric substance (1)

OR

How many effective sodium ions are present at the centres of edges of a unit cell in a sodium chloride crystal? .

2 What is abnormal molecular mass? (1)

3 What are pseudo first order reactions? (1)

4 Why carbonyl compounds are highly polar in nature?

OR

What is glacial acetic acid? (1)

5 What is Dopamine? (1)

6 $N_{2(g)} + O_{2(g)} \longrightarrow 2NO(g)$ is an endothermic reaction yet it is spontaneous. Explain the

reason. (2)

7 Write balanced equations for the following reactions;

(i) SnO is treated with dilute HNO_3

(ii) Aqueous sodium hydroxide is added dropwise to a solution of gallium chloride in water. A precipitate is formed initially which dissolves on further addition of NaOH solution. (2)

8 Explain the following terms: (2)

(i) Asymmetric induction

(ii) Stereoselective reactions

9 Explain giving reasons: (2)

(i) *ortho*-nitrophenol is more acidic than *ortho*-methoxy phenol

(ii) Propanol has higher boiling point than butane

10 Will you prefer to polymerize acrylonitrile under anionic or cationic polymerization conditions? Explain your choice. (2)

OR

How does the presence of Benzoquinone inhibit the free radical polymerisation of a vinyl derivative?

11 Draw Fischer projections of L-galactose and L-mannose. (2)

12 Use molecular orbital theory to explain why Be_2 molecule does not exist? (2)

13 Two p-orbitals from one atom and two p-orbitals from another are combined to form molecular orbitals. How many molecular orbitals will result from this combination? Explain. (3)

14 Analysis shows that nickel oxide has formula $Ni_{0.98}O_{1.00}$. What fractions of the nickel exist as Ni^{+2} and Ni^{+3} ions? (3)

15 How many ml of a 0.1M HCl are required to react completely with1 gm mixture of Na_2CO_3 and $NaHCO_3$ containing equimolar amounts of two? (3)

OR

Calculate the mass of a non-volatile solute (molecular mass 40) which should be dissolved in 114 gm octane to reduce its vapour pressure to 80%.

16 In a fuel cell (a device for producing electricity directly from chemical reaction) , methanol is used as fuel and oxygen gas is used as an oxidizer. The reaction is:

$$CH_3OH_{(l)} + {}_{3/2}\, O_2 \longrightarrow CO_{2\,(g)} + 2H_2O_{(l)}$$

Calculate the standard Gibbs energy change for the reaction that can be converted into electrical work. If standard enthalpy of combustion for methanol is – 726 kJ mol^{-1}. Calculate the efficiency of conversion of Gibbs free energy into useful work. Given that

$\cong G^0_f$ values (kJ mol^{-1}): $CH_3OH_{(l)} = -166.3$ $CO_{2\,(g)} = -394.4$, $H_2O_{(l)} = -237.1$ (3)

17 During nuclear explosion, one of the products is ^{90}Sr with half life of 28.1 years. If one μg of ^{90}Sr was absorbed in the bones of a newly born baby instead of calcium , how much of it will remain after 10 years and 60 years if it is not lost metabolically. (3)

18 Describe a chemical method each for the preparation of sols of sulphur and platinum in water. (3)

19 (a) Discuss the nature of bonding in $[Ni(CO)_4]$.

(b) Using IUPAC norms write the formulae for the following:

(i) Potassiumtri (oxalato) chromate (III) 2+1=3

(ii) Potassiumtetrachloropalladate (II)

20 Write the nuclear reactions for the following radioactive decay:

(i) $^{238}U_{92}$ undergoes α decay

(ii) $^{234}Pa_{91}$ undergoes β^- decay

(iii) $^{22}Na_{11}$ undergoes β^+ decay (3)

21 How will you prepare the following compounds from benzene? You may use any inorganic reagent and any organic reagent having not more than one carbon atom.

(i) Methyl benzoate

(ii) *m*-nitrobenzoic acid

(iii) Phenylacetic acid (3)

22 Explain giving reasons:

(1) Even under mild conditions aniline on bromination gives 2, 4, 6,-tribromoaniline

instantaneously.

(2) It is difficult to prepare pure amines by ammonolysis of alkyl halides.

(3) Aniline is a weaker base than cyclohexyl amine.

OR

Explain giving reasons:

1) Alkyl amines are stronger bases than aryl amines.
2) Toluene is more easily nitrated than benzene.
3) Amino group is o,p-directing for aromatic electrophilic substitution ,but on nitration it gives substantial amount of nitrobenzene.

23 Which forces are responsible for the stability of α helix? Why is it named as 3.6_{13} helix? Explain secondary structure of proteins. (3)

24 What are carbon fibres? How are they designed? Write two important uses of carbon fibres. (3)

25 (i) The zinc/ silver oxide cell is used in hearing aids and electric watches. The following reaction takes place:

$Zn \longrightarrow Zn^{+2} + 2e^-$; $E^0 = 0.76$ volts

$Ag_2O + H_2O + 2e^- \longrightarrow 2A_g + 2OH^-$; $E^0 = 0.344$ V

(a) What is oxidised and reduced?

(b) Find E^0 of the cell and ΔG in joules.

(ii) Explain Kohlrausch's law of independent migration of ions. Mention one application of Kohlrausch's law. 3+2

OR

(a) 'Corrosion is an electrochemical phenomenon'. Explain.

(b) Give reasons:

(i) For a weak electrolyte, its molar conductance in dilute solutions increases sharply as its concentration in solution is decreased.

(ii) For cathodic protection aluminium cannot be used in place of zinc.

26 Describe the shapes of the following molecules:

(i)

(a) SbF_3

(b) SF_4

(ii) How is lead extracted from galena? Write two equations for the reactions which occur during the process of extraction. (2+3)

OR

(a) What are silicates? How are they classified?

(b) Give Reasons:

(i) CO_2 is a gas but SiO_2 is a solid.

(ii) C and Si are tetravalent but Ge ,Sn and Pb show divalency (3+2)

.27 Answer the following:

(i) $K_2Cr_2O_7$ is orange in colour but turns yellow in an alkaline medium, why?

(j) Draw the structure of dichromate and chromate ion.

(k) Silver halides dissolve in thiosulphate ions. Write chemical reaction and the structure of silver complex formed in the reaction.

(l) With d^4 configuration Cr^{+2} is reducing whereas Mn^{+3} is oxidising.

(m) There is resemblance in the chemical properties of 4d and 5d transition series.

OR

(a) compare the chemistry of lanthanoids and actinoids with special reference to

(i) Electronic configurations

(ii) Oxidation states

(b) Explain Photography. (5)