1st Year

CHEMISTRY (11th Class)

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Important Questions

Chapter 1: Basic Concepts

Short Questions

1	Points of Dalton's atomic theory.
2	Work of Berzelius.
3	Atomicity and macromolecules with example.
4	What is molecular ion? How it is formed?
5	Why isotopes have same chemical properties but different physical properties?
6	No individual Ne (neon) atom in the sample has a mass of 20.18 a.m.u justify.
7	What is the principle of mass spectrometry?
8	Define average atomic mass and relative atomic mass.
9	Differentiate between empirical formula and molecular formula.
10	What is molar volume?
11	23g of sodium and 238g of uranium have equal number of atoms in them. Justify.
12	Mg atom is twice heavier than that of carbon atom.
13	180g of glucose and 342 g of sucrose have the same number of molecules but different number of atoms present in them. Justify.
14	Define Avogadro's number and give its value.
15	Define Stoichiometry with suitable example.
16	What are the assumptions of stoichiometry?
17	Define limiting reactant with example.
18	Write down the steps involved in the determination of a limiting reactant.
19	Concept of limiting reactant is not applicable on reversible reactions. Justify.
20	Why actual yield is less than theoretical yield?
21	How can we calculate the efficiency of the chemical reaction?
22	Law of conservation of mass has to be obeyed during stoichiometric calculations.
23	CO and N2 have same number of electrons protons and neutrons.
24	Many chemical reactions taking place in our surrounding involve limiting reactant.

Long Questions

1	Define the terms with example (Molecule. Mole. Isotopes. Molecular ions).
2	Mass spectrometry.
3	Combustion analysis for the determination of C, H, O in organic compound.
4	Steps to calculate empirical formula.

5	Avogadro's Number
6	Stoichiometry
7	Limiting reactant
8	Yield

Chapter 2: Experimental Techniques in Chemistry

Short Questions

1	What is sublimation? Give example.
2	Why there is need to crystallize the crude product?
3	Define crystallization. Write names of its steps.
4	Good qualities of ideal solvent used in crystallization.
5	How undesirable colours are separated from a crude product?
6	Differentiate between distribution law and distribution co-efficient.
7	What is solvent extraction technique?
8	Differentiate between stationary phase and mobile phase.
9	Differentiate between adsorption chromatography and partition chromatography.
10	What is retardation factor (Rf)? Why it has no unit?
11	Uses of chromatography.

Long Questions

	Long Questions (Not Included)

Chapter 3: Gases

Short Questions

1	Gas law's (define and mathematical relation).
2	Why do we get a straight line when pressures exerted on a gas are plotted against inverse of volume?
3	Define absolute zero. Write its value.
4	Scales of thermometry (definition and conversion). Convert 40C0 into F0 scale.
5	Value of R in different units (S.I unit imp).
6	Why water vapours do not behave ideally at 273K?
7	How can you calculate the molecular mass by density?
8	Dalton's law is applicable in respiration. Justify.
9	Why pilots feel uncomfortable at high altitude?
10	Why deep sea divers take oxygen mixed with inert gas?
11	Differentiate between diffusion and effusion with examples.
12	State Graham's Law of diffusion and write its mathematical form.

13	Four postulates of K.M.T.
14	Two faulty points of K.M.T.
15	Differentiate between mean square velocity and root mean square velocity.
16	Derive gas laws from K.M.T (Boyle's Charle's Avogadro's).
17	Critical temp, volume, pressure with examples.
18	Units of ''a'' and ''b'' Vander waal's constants.
19	How is plasma formed?
20	Differentiate between natural and artificial plasma.
21	Write the characteristics of plasma.
22	What is the future horizon of plasma?
23	Write the applications of plasma.
	Long Questions
	Numericals (Only examples)

Chapter 4: Liquids and Solids

Short Questions

1	Intermolecular forces (dipole- dipole, debye forces, instantaneous).
2	Why ethane is gas while hexane is a liquid?
3	Define hydrogen bonding and show H-bonding in HF, NH3, CHCl3-acetone.
4	Why HF is weaker acid as compared to HCl, HBr, HI?
5	H2O is liquid while H2S and H2Se are gases at room temperature. Give reason.
6	Boiling point of H2O is greater than that of HF. Justify.
7	Water and ethanol can mix easily and in all proportions. Justify.
8	Why ice floats on the surface of water?
9	In a very cold winter the fish in garden ponds owe their lives to hydrogen bonding.
10	Define H-bonding in soaps and detergents.
11	How earthenware vessels keep water cool?
12	One feels sense of cooling under fan after bath. Why?
13	Evaporation is a cooling process. Justify.
14	Why boiling point of water is different at Murree hills and at Mount Everest?
15	Define Polarizibility. How it effect London dispersion forces?
16	How liquid crystals are used to find the potential failure in electrical circuits?
17	How liquid crystals are used to locate infections and tumors in body?
18	Differentiate between crystalline solid and amorphous solid.
19	Define cleavage planes and symmetry.

20	Differentiate between anisotropy and allotropy.
21	Differentiate between isomorphism and polymorphism.
22	Define habit of crystal.
23	Define transition temperature with one example.
24	Define unit cell with example.
25	Draw the shape, axes and angles of hexagonal, cubic and orthorhombic system.
26	Why ionic crystals do not conduct electricity in the solid state?
27	Why ionic crystals are brittle?
28	Diamond is hard and an electrical insulator. Give reason.
29	The electrical conductivity of metals decreases with the increase in temperature. Why?
30	Electron gas/ pool theory.

Long Questions

1	Intermolecular forces and its types.
2	Factors affecting the strength of London forces.
3	Define H-bonding and explain H-bonding in biological molecules (proteins, DNA).
4	Structure of ice.
5	Measurement of vapour pressure by Manometric Method.
6	What are liquid crystals? Also write its uses.
7	Explain the terms (isomorphism-polymorphism, Transition temperature, types of solids).
8	Define ionic solid. Write its properties.

Chapter 5: Atomic Structure

Short Questions

1	Why is it necessary to decrease the pressure in discharge tube?
2	Whichever gas is used in the discharge tube, the nature of the cathode rays remains the same.
3	Why the nature of cathode rays is independent of the nature of gas used in discharge tube?
4	Why e\m value of the cathode rays is just equal to that of electron?
5	Why positive rays are also called canal rays?
6	The e\m value for positive rays obtained from hydrogen gas is 1836 times less than that of cathode rays. Justify it.
7	Justify that cathode rays are material particles.
8	How neutrons were discovered?
9	Differentiate between fast moving and slow moving neutrons.
10	How mass of electron can be calculated from e\m?

11	Two postulates of Planck's theory.
12	Write two postulates of Bohr's atomic model.
13	Differentiate between Zeeman effect and Stark effect.
14	What is spin quantum number?
15	What are degenerate orbitals?
16	Differentiate between atomic emission and atomic absorption spectrum.
17	State Moseley's law. Give its mathematical expression.
18	Define Heisenberg's uncertainty principle with mathematical relation.
19	State Hund's rule, Aufbau principle and Pauli's exclusion principle.
20	Electronic distribution of (P, Cu, Cr, Zn, Br).
21	Difference between orbit and orbita.
22	What is the origin of hydrogen spectrum?

Long Questions

1	Measurement of e\m value of electron (J.J Thomson experiment).
2	Properties 0f cathode rays (any eight).
3	Charge on electron- Millikan's oil drop method.
4	Derivation of radius of revolving electron in nth orbit.
5	Defects of Bohr's atomic model.
6	Calculate wave number of Lyman and Balmer series.
7	Study of X-rays by Moseley.
8	Heisenberg's uncertainty principle.
9	Define quantum numbers and explain (Azimuthal, principal , magnetic) quantum numbers.

Chapter 6: Chemical Bonding

Short Questions

1	Define chemical bond and write the causes of chemical combination.
2	Define octet rule. Give two examples that do not obey this rule.
3	Why the radius of an atom cannot be determined precisely?
4	Differentiate between atomic radii, ionic radii and covalent radii.
5	Why the size of a cation is smaller than its parent atom?
6	Why the size of anion is greater than its parent atom?
7	Second I.E is always higher than 1st I.E value. Justify.
8	Why the second value of electron affinity of an element is usually shown with the positive sign?
9	How the nature of a chemical bond is predicted with the help of electronegativity

	values?
10	Define ionization energy and electronegativity. Write its periodic trend.
11	Define coordinate covalent bond with example.
12	Differentiate between polar and non-polar covalent bond with examples.
13	Why the lone pair of electrons occupies more space than bond pairs?
14	Bond angles of CH4, NH3 and H2O are different while all these show sp3 - hybridization.
15	Why MOT is superior to VBT?
16	Draw the structure of He2 with MOT.
17	Bond distance is the compromise distance between two atoms. Justify.
18	A sigma bond is stronger than a pi-bond.
19	Pi-bonds are more diffused than sigma bond.
20	Differentiate between bonding and antibonding molecular orbitals.
21	The dipole moment of CO2 and CS2 is zero while CO and SO2 is not zero. Justify.
22	How the percentage ionic character of a covalent bond is determined by dipole moment?
	Long Questions
1	Ionization energy.
2	Electron affinity.
3	Postulates of VSEPR Theory (Most v.imp).
4	Ionic bond.
5	Covalent bond.
6	Define hybridization and explain sp3 , sp2 and SP-hybridization.
7	Draw the structures of N2, O2 with the help of MOT.
8	Dipole moment.
	Chapter 7: Thermochemistry
	Short Questions
1	Differentiate between internal energy and enthalpy.
2	Differentiate between internal energy change and enthalpy change.
3	Differentiate between exothermic and endothermic reaction.
4	Differentiate between spontaneous and non-spontaneous reactions.
5	Justify that burning of candle is spontaneous process.
6	Why it is necessary to mention the physical states of reactants and products in thermochemical reactions?
7	Define system, surrounding and state function with examples.

8	State 1st law of thermodynamic with mathematical formula.
9	Enthalpy of formation and combustion with examples.
10	Enthalpy of atomization and solution with examples.
11	Enthalpy of neutralization with examples.

Long Questions

1	Prove that ΔH=qp, ΔE=qv (m.imp).
2	Glass calorimeter and Bomb calorimeter.
3	Hess's law.

Chapter 8: Chemical Equilibrium

Short Questions

1	Differentiate between reversible and irreversible reaction.
2	Define Law of mass action with mathematical expression.
3	Units of Kc value.
4	How some reactions are effected by volume at equilibrium stage?
5	State Le-Chatelier's principle.
6	What is the effect of catalyst and temperature on equilibrium constant?
7	What is the effect of temperature on solubility?
8	Define pH, pOH, pKa and pKb.
9	How Kc is used to find the direction of reaction?
10	How ammonia is synthesized by Haber's process? Also write its conditions.
11	Define common ion effect with one example.
12	Define buffer solutions, why do we need buffer solutions?
13	How do the buffers act?
14	What is buffer capacity?
15	Define solubility product. Give its expression.

Long Questions (Numericals)

1	Examples: (except 3)
2	Exercise: (22 ,24 25)

Chapter 9: Solutions

Short Questions

1	Relative lowering of vapour pressure is independent of temperature.
2	Define molarity of solution with equation.
3	Define molality of solution with equation.

4	One molal solution of urea, in water is dilute as compared to one molar solution of urea, but the number of particles of solute is same. Justify.
5	Sum of the mole fractions of components of solution is always equal to unity. Justify.
6	Define upper consulate temperature with example.
7	Justify that molarity is temperature dependent while molality is independent.
8	Non-ideal solutions do not obey Raoult's law.
9	Differentiate between ideal and non -ideal solution.
10	Differentiate between zeotropic and azeotropic solution with example.
11	Relative lowering of vapour pressure is independent of temperature.
12	Define continuous and discontinuous solubility curve.
13	Define colligative properties and name some colligative properties.
14	Why some properties are called colligative?
15	Differentiate between ebullioscopic and cryoscopic constants.
16	Colligative properties are obeyed when the solute is non-electrolyte and also when the solutions are dilute.
17	What is the physical significance of Kb and Kf?
18	Boiling point of solvent increases due to presence of solutes. Justify.
19	Freezing points are depressed due to the presence of solutes. Justify.
20	In summer antifreeze solutions protect the liquid of radiator from boiling over. Justify.
21	NaCl and KNO3 are used to lower the melting point of ice. Justify.
22	Define hydration energy of ions.
23	Aqueous solution of CuSO4 is acidic in nature. Justify.
24	Define hydration and hydrolysis.
	Long Questions
1	Raoult's Law(both cases).
2	Landsberger's Method.
3	Elevation of boiling point.
4	Beckmann's Method.
5	Applications of boiling point elevation and freezing point depression.
	Chapter 10: Electrochemistry
	Short Questions
1	Differentiate between electrolytic cell and galvanic cell.
2	Define electrochemistry.
3	Rules for assigning oxidation number.
4	Calculate oxidation numbers of different atoms.

5	Difference between ionization and electrolysis.
6	What is Hall-Beroult process?
7	How impure Cu can be purified by an electrolytic process?
8	What is anodized aluminum? Give its advantage.
9	What is the function of salt bridge? OR a salt bridge maintains the electrical neutrality Explain.
10	Define electrode potential.
11	Define SHE.
12	SHE acts as anode when connected with Cu-electrode and as cathode when connected to Zn electrode.
13	How electrochemical series helps to predict the feasibility of chemical reaction?
14	The standard oxidation potential of Zn is +0.76v and its reduction potential is -0.76v. Why?
15	Difference between primary and secondary cell with examples.

Long Questions

1	Electrolytic cell.
2	Voltaic cell\ Galvanic cell.
3	Rules for assigning oxidation numbers.
4	SHE.
5	Measurement of electrode potential.
6	Define electrochemical series and explain any three applications.
7	Lead accumulator battery (recharging and discharging).
8	Fuel cells.

Chapter 11: Reaction Kinetcs

Short Questions

1	Difference between rate of reaction and order of reaction.
2	What is meant by order of reaction? Give example.
3	Difference between instantaneous rate and average rate of reaction.
4	Define specific rate constant or velocity constant.
5	Define zero order reaction and pseudo 1st order reaction with examples.
6	The radioactive decay is always a 1st order reaction. Justify.
7	Define half- life period with example.
8	What is rate determining step? Give example.
9	Difference between energy of activation, activated complex and lattice energy.
10	Justify that rate of reaction depends upon surface area.

11	What is effect of temperature on energy of activation of a reaction?
12	Justify that catalyst is specific in its action.
13	A finely divided catalyst may prove more effective. Give reason.
14	Define autocatalyst with one example.
15	Difference between homogeneous and heterogeneous catalysis with example.

Long Questions

1	Explain half- life period.
2	Measurement of rate of reaction by Chemical method.
3	Explain energy of activation.
4	How half-life method is helpful to find order of reaction?
5	How does the Arrhenius equation help us to calculate the energy of activation of a reaction?