

11th Class Chemistry Objective Paper Group 1 Sahiwal Board 2024

Chemistry

Group: 1st

HSSC(11th)1st Annual 2024

Roll No: _____ (written by the candidate only)

Paper: I

Objective (iii)

Code

6

4

8

5

Time: 20 Minutes

Marks: 17

Note: - You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number in your answer book. Use marker or pen to fill the circles. Cutting or filling up two or more circles will result no mark.

SECTION-A

pakcity.org

Q.1	Questions	A	B	C	D
1.	Orbitals having same energy are called:	Degenerate orbitals	Valence orbitals	d-orbitals	s and p orbitals
2.	Amorphous solids:	Can possess small regions of orderly arrangement of atoms	Have sharp melting point	Have perfect arrangement of atoms	Undergo clean cleavage when cut with knife
3.	Halogen that exists as solid at room temperature is:	F ₂	Cl ₂	Br ₂	I ₂
4.	The order of rate of diffusion of gases NH ₃ , SO ₂ , Cl ₂ and CO ₂ is:	NH ₃ > SO ₂ > Cl ₂ > CO ₂	Cl ₂ > SO ₂ > CO ₂ > NH ₃	NH ₃ > CO ₂ > Cl ₂ > SO ₂	NH ₃ > CO ₂ > SO ₂ > Cl ₂
5.	What is the most abundant form of matter around us on our earth.	Gas	Liquid	Solid	Plasma
6.	How many steps are involved in complete quantitative characterization?	2	3	4	5
7.	Which of the given is used as decolourizing agent in crystallization?	Graphite	Animal Charcoal	H ₂ SO ₄	KOH
8.	Which of the given is a mono isotopic element?	Fluorine	Chlorine	Silver	Calcium
9.	The largest number of molecules are present in:	4.8g of C ₂ H ₅ OH	3.6g of H ₂ O	2.8g of CO	5.4g of NO
10.	If salt bridge is not used between two half cells then the voltage:	Decreases slowly	Drops to zero	Decreases rapidly	Does not change
11.	The rate of reaction:	Decreases as the reaction proceeds	Increases as the reaction proceeds	Remains the same as the reaction proceeds	May decrease or increase as the reaction proceeds
12.	A solution of glucose is 10% w/v. The volume in which its one g.mole is dissolved will be:	1 dm ³	1.8 dm ³	200 cm ³	900 cm ³
13.	Which of the given is weak acid?	HCl	H ₂ SO ₄	CH ₃ COOH	HNO ₃
14.	One calorie is equal to:	0.4184 J	41.84 J	418.4 J	4.184 J
15.	Which of the given species has unpaired electrons in antibonding molecular orbitals?	O ₂ ²⁻	B ₂	N ₂ ²⁻	F ₂
16.	Molecular shape of SO ₃ according to VSEPR Theory:	Triangular Planar	Linear	Pyramidal	Tetrahedral
17.	Visible range contains wave length in between:	200-400 n.m	400-750 n.m	200-800 n.m	800-1200 n.m

Please visit for more data at: www.pakcity.org

211-324-14-17000 ★★★

Chemistry

Group: 1stHSSC(11th)1stAnnual 2024

Roll No: _____ (written by the candidate only)

Paper: I

Time: 2:40 Hours

Subjective

Marks: 68

Note:- Section B is compulsory. Attempt any THREE questions from Section C.

**SECTION-B**

2. Write short answers to any EIGHT parts.

(8 × 2 = 16)

- i. Why 23 g of sodium and 238 g of uranium have equal number of atoms in them?
- ii. Define gram formula giving one example.
- iii. Write down two characteristics of plasma.
- iv. What do you mean by partition chromatography? Give Example.
- v. Define sublimation and name at least two sublimed solids.
- vi. How can rate of filtration be increased by fluted filter paper?
- vii. How does values of equilibrium constant (K_c) help predict extent of a reaction?
- viii. Why lighter gases diffuse more rapidly than heavier ones?
- ix. How are acidic and basic buffers prepared? Give one example in each case.
- x. State Charles's law of gases. Give its mathematical form.
- xi. Differentiate between reversible and irreversible reactions with examples.
- xii. How Mg-atom is twice heavier than that of carbon atom? Explain.

3. Write short answers to any EIGHT parts.

(8 × 2 = 16)

- i. Boiling needs constant supply of heat. Give reason.
- ii. How chloroform and acetone are miscible with each other?
- iii. How does liquid crystals act as temperature sensors?
- iv. Why Molecular solids are soft and easily compressible?
- v. What is the reason for production of positive rays?
- vi. Differentiate between Zeeman and Stark effect.
- vii. Give two points for the significance of Moseley's law.
- viii. Why boiling points of solvents increase due to the presence of solutes?
- ix. What do you mean by Heterogeneous catalysis? Give two examples.
- x. Draw the shapes of 's' and 'p' orbitals.
- xi. Rate of a reaction is everchanging parameter under the given conditions. Justify it.
- xii. Define "Hydrolysis". Give two examples.

4. Write short answers to any SIX parts.

(6 × 2 = 12)

- i. Write down the electrode reactions in alkaline battery.
- ii. Define dipole moment. Give its various units.
- iii. What is pressure-volume work?
- iv. Why do the ionization energies of elements decrease down the group of periodic table although the nuclear charge increases?
- v. The abnormality of bond length in HI is less prominent than that of HCl. Give the reason.
- vi. Why is MOT superior to VBT?
- vii. Define standard enthalpy of a reaction. Give an example.
- viii. Differentiate between exothermic and endothermic reactions.
- ix. SHE acts as anode when connected with Cu electrode but as cathode when connected with Zn electrode. Give the reason.

SECTION-C: Note: Attempt any THREE questions. Each question carries EIGHT (08) marks.

(8 × 3 = 24)

5. (a) What are Ions? Give their different types. Under what conditions these can be generated? (4)
(b) Name the factors affecting the "London Forces". Explain the boiling points of halogens in detail. (4)
6. (a) Calculate the density of CH₄(g) at 0°C and 1 atm pressure. (4)
(b) How $\frac{e}{m}$ value of electron is measured? (4)
7. (a) Define and explain co-ordinate covalent bond with three examples. (4)
(b) What is the percentage ionization of acetic acid in a solution in which 0.1 moles of it has been dissolved per dm³ of the solution (Ka of acetic acid = 1.85 × 10⁻⁵)? (4)
8. (a) Describe in detail the measurement of enthalpy of combustion with the help of Bomb Calorimeter with diagram. (1+3=4)
(b) Define primary storage cell. Explain silver oxide battery in detail. (1+1+2=4)
9. (a) What is Raoult's Law? Explain it with three statements also. (4)
(b) Define order of reaction. Name various methods for its determination and explain only half life method in detail. (4)

211-324-1A-17000

Chemistry

Group: 2ndHSSC(11th)1stAnnual 2024

Roll No: _____ (written by the candidate only)

Paper: I

Objective (iv)

Code

6

4

8

8

Time: 20 Minutes

Marks: 17

Note: - You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of that question number in your answer book. Use marker or pen to fill the circles. Cutting or filling up two or more circles will result no mark.

SECTION-A



Q.1	Questions	A	B	C	D
1.	The quantum number which gives information about degeneracy of orbitals in space is:	Principal quantum number	Azimuthal quantum number	Magnetic quantum number ●	Spin quantum number
2.	The molecules of CO ₂ in dry ice form:	Ionic crystals	Covalent solids	Molecular solids ●	Metallic solids
3.	Acetone and Chloroform are soluble in each other due to:	Hydrogen bonding ●	Ion-dipole forces	Instantaneous dipole	London dispersion forces
4.	The partial pressure of oxygen in the air is:	116 torr	200 torr	159 torr ●	150 torr
5.	The drying agent used in vacuum desiccator is:	Benzoic acid	Glucose	Silical gel ●	Animal charcoal
6.	Solvent extraction is an equilibrium process and is controlled by:	Law of mass action	The amount of solvent	Distribution law ●	The amount of solute
7.	The molar volume of CO ₂ is maximum at:	S.T.P	127 °C and 1 atm ●	0 °C and 2 atm	273 °C and 2atm
8.	The number of moles of CO ₂ which contain 8.0g of oxygen is:	● 0.25	0.50	1.0	1.50
9.	The empirical formula of glucose is:	CHO	C ₆ H ₁₂ O ₆	C ₂ H ₄ O ●	CH ₂ O ●
10.	The reduction potential of Zinc electrode is:	0.76 volt	-0.76 volt ●	-0.34 volt	0.34 volt
11.	The catalyst used in the decomposition of KClO ₃ is:	CuCl ₂	V ₂ O ₅	MnO ₂ ●	NO
12.	The molal boiling point constant is the ratio of the elevation in boiling point to:	Molarity	Mole fraction of solvent	Molality ●	Mole fraction of solute
13.	The pH of human blood is maintained at:	7.0	7.35 ●	4.0	14.0
14.	For a given process, the heat changes at constant pressure (q _p) and at constant volume (q _v) are related to each other as:	q _p = q _v	q _p < q _v	q _p > q _v ●	q _p = $\frac{q_v}{2}$
15.	Which of the hydrogen halides has the highest percentage of ionic character?	HCl	HBr	HF ●	HI
16.	C ₂ H ₄ (ethene) shows hybridization:	sp ³	sp ² ●	sp	dsp ²
17.	The wave number of the light emitted by a certain source is 2×10 ⁶ m ⁻¹ . The wavelength of this light will be:	500 nm	500 m ●	200 nm	5×10 ⁷ m

212-324-14-11000 ★★★★★

Chemistry

Group: 2ndHSSC(11th) 1st Annual 2024

Roll No: _____ (written by the candidate only)

Paper: I

Time: 2:40 Hours

Subjective

Marks: 68

Note:- Section B is compulsory. Attempt any THREE questions from Section C.**SECTION-B****2. Write short answers to any EIGHT parts.****(8 × 2 = 16)**

- i. Define Avogadro's number with a suitable example.
- ii. Write down two assumptions of stoichiometry.
- iii. Many chemical reactions involve limiting reactant as taking place in our surrounding. Justify.
- iv. Why is crystallization a better technique for separation and purification?
- v. Name any four sublimed solids.
- vi. What is R_f value? Also write down its formula.
- vii. Deduce Boyle's law with the help of Kinetic theory of gases.
- viii. Write down any four applications of plasma.
- ix. How does buffer act?
- x. The plot of PV versus P is a straight line at constant temperature and with a fix number of moles of an ideal gas. Explain.
- xi. How does equilibrium constant (K_c) predict direction of a reaction? xii. Give optimum conditions to get maximum yield of Ammonia (NH_3).

3. Write short answers to any EIGHT parts.**(8 × 2 = 16)**

- i. What are liquid crystals? Write down their any two uses.
- ii. Evaporation causes cooling, why?
- iii. Define Anisotropy. Give example.
- iv. Ionic crystals are highly brittle, why?
- v. Write down any two properties of neutrons.
- vi. What is stark effect?
- vii. What is meant by dual nature of matter?
- viii. Define spin quantum number.
- ix. What is percentage weight / weight? Give example.
- x. Non ideal solutions do not obey Raoult's law, why?
- xi. What is heterogeneous catalysis? Give example.
- xii. Define energy of activation.

4. Write short answers to any SIX parts.**(6 × 2 = 12)**

- i. Why atomic radius cannot be measured precisely?
- ii. Size of an anion is always larger than its parent atom. Justify.
- iii. Why is the second electron affinity of oxygen positive?
- iv. Why He_2 does not exist under normal conditions.
- v. Why is it necessary to mention physical states of reactants and products in thermo chemical equation?
- vi. Define internal energy with one example.
- vii. Calculate oxidation number of Cr in $\text{K}_2\text{Cr}_2\text{O}_7$.
- viii. Write down importance of standard hydrogen electrode.
- ix. Define heat and work.

SECTION-C: Note: Attempt any THREE questions. Each question carries EIGHT (08) marks.**(8 × 3 = 24)**

5. (a) What is meant by combustion analysis? Draw neat diagram. Also write down formulas to calculate percentages of carbon and hydrogen. **(1+1+2)**
(b) What are ionic solids? Write down any six properties of ionic solids. **(1+3)**
6. (a) Calculate the mass of 1 dm^3 of NH_3 gas at 30°C and 1000 mmHg pressure considering that NH_3 is behaving ideally. **(4)**
(b) Write down any eight properties of cathode rays. **(4)**
7. (a) Write down four postulates of VSEPR theory. **(4)**
(b) The solubility product of Ag_2CrO_4 is 2.6×10^{-12} at 25°C . Calculate the solubility of the compound. **(4)**
8. (a) State first law of thermodynamics. How will you prove that work done by the system is negative ($W = -P\Delta V$). **(4)**
(b) What is electrochemical series? Explain the following application in detail: **(1+3)**
(i) Comparison of the relative tendency of metals and non metals to get oxidized or reduced.
9. (a) Explain Beckmann method for the measurement of freezing point depression with diagram. **(3+1)**
(b) Define order of reaction. Give one example of first order, second order and third order reaction. **(1+1+1+1)**

212-324-14-11000

Chemistry

H.S.S.C (11th) 1st Annual 2023

Time : 20 Minutes

Paper : I

Group : I

Objective – (ii)

Marks : 17

Paper Code 6 4 8 3

Note: - You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of that question number in your answer book. Use marker or pen to fill the circles. Cutting or filling up two or more circles will result no mark.

SECTION-A



Q.1	Questions	A	B	C	D
1.	Splitting of spectral lines when atoms are subjected to strong electric field is called:	Zeeman effect	Photoelectric effect	Stark effect	Compton effect
2.	Which of the given molecules has zero dipole moment?	BF ₃	H ₂ O	CHCl ₃	NH ₃
3.	For a given process, the heat changes at constant pressure (q _p) and at constant volume (q _v) are related to each other as:	q _p = q _v	q _p > q _v	q _p < q _v	q _p = q _v /2
4.	The enthalpy of solution of sodium carbonate is:	-16.2 KJmol ⁻¹	+16.2 KJmol ⁻¹	-25.0 KJmol ⁻¹	-285.8 KJmol ⁻¹
5.	For which system does the equilibrium constant, K _c has the units of (concentration) ⁻¹ ?	N ₂ + 3H ₂ ⇌ 2NH ₃	H ₂ + I ₂ ⇌ 2HI	2HF ⇌ H ₂ +F ₂	2NO ₂ ⇌ N ₂ O ₄
6.	The solution having zero pH will be:	acidic	Highly acidic	neutral	basic
7.	Which one of the given salts will not hydrolyse in water?	NaCl	AlCl ₃	Na ₂ CO ₃	CH ₃ COONa
8.	If a strip of Cu metal is placed in a solution of FeSO ₄ :	Cu will be deposited	Fe is precipitated out	Cu and Fe both dissolve	No reaction takes place
9.	During a redox reaction, an oxidizing agent:	Gains electrons	Is oxidized	Loses electrons	Is hydrolyzed
10.	If the rate equation of a reaction 2A+B → Product Rate=[A] ² [B], and A is present in large excess, then the order of reaction is:	2.5	3	1	2
11.	Which of the given hydrocarbons has the highest value of heat of vaporization?	CH ₄	C ₂ H ₆	C ₃ H ₈	C ₆ H ₁₄
12.	Ionic solids are characterized by:	Low melting points	Good conductivity in solid state	High vapour pressures	Solubility in polar solvents
13.	The density of an ideal gas at a given temperature and pressure can be calculated by employing the formula:	$d = \frac{PM}{RT}$	$d = \frac{P}{RT}$	$d = \frac{nP}{RT}$	$d = \frac{PM}{V}$
14.	Pressure remaining constant, at which temperature, the volume of a gas will become twice of what it is at 0 °C:	546 °C	200 °C	273 °C	100 °C
15.	The comparative rates at which the solutes move in paper chromatography depend on:	The size of paper	R _f values of solutes	Temperature of the experiment	Size of the chromatographic tank used
16.	One dm ³ of N ₂ at S.T.P contains about:	5.37x10 ²² atoms	3.01x10 ²³ atoms	6.02x10 ²³ atoms	2.68x10 ¹⁹ atoms
17.	The number of moles of CO ₂ which contains 16g of Oxygen:	0.25	0.50	1.0	1.50

Note:- Section B is compulsory. Attempt any Three questions from Section C.

SECTION-B

2. Write short answers to any Eight parts.

(8 x 2 = 16)

- No individual Neon (Ne) atom in the sample of element has mass of 20.18 amu. Why?
- Calculate the number of molecules in 10g of ice.
- How efficiency of reaction is expressed?
- Derive units of 'R' in general gas equation in SI (System International) system.
- Why normal air cannot be used in diver's tank?
- Prove that $d = \frac{PM}{RT}$ from ideal gas equation.
- State Pauli exclusion principle.
- Why nature of Cathode rays is independent of gas used in discharge tube.
- What is origin of spectrum of hydrogen?
- Define standard enthalpy of neutralization with one example.
- What is state function? Give one example.
- Burning of candle is spontaneous process. Justify.

3. Write short answers to any Eight parts.

(8 x 2 = 16)

- Define analytical chemistry.
- Write four salient features of an ideal solvent, used in the process of crystallization.
- What is the difference between adsorption and partition chromatography?
- Write difference between evaporation and condensation.
- Why boiling point of H₂O is higher than that of HF.
- Write difference between crystalline solid and amorphous solid.
- Define zeotropic solutions and concentrated solution.
- Justify that boiling points of the solvents increase due to the presence of solute.
- Non-ideal solutions do not obey the Raoult's law. Give reason.
- Differentiate between homogeneous and heterogeneous catalyses.
- Define Enzyme catalysis. Give one example.
- The radioactive decay is always a first order reaction. Justify.

4. Write short answers to any Six parts.

(6 x 2 = 12)

- Define ionization energy with an example.
- π bonds are more diffused than sigma (σ) bonds. Justify.
- O₂ is paramagnetic. Why?
- State Le-Chatelier's principle.
- Buffers are important in many areas of Chemistry. Justify.
- How K_c predicts the direction of a chemical reaction.
- Calculate oxidation number of chromium in Cr₂(SO₄)₃.
- Define electrode potential with an example.
- Write down the importance of Standard Hydrogen Electrode (SHE).

SECTION-C

Note: Attempt any Three questions. Each question carries Eight (08) marks.

(8x3=24)

- What is a limiting reactant? Give example. Also write down steps to identify it. (4)
 - A sample of Krypton with a volume of 6.25 dm³, a pressure of 765 torr and a temperature of 20 °C is expanded to a volume of 9.55 dm³ and a pressure of 375 torr. What will be its final temperature in °C? (4)
- Discuss structure of sodium chloride in detail. (4)
 - Differentiate between spontaneous and non-spontaneous process with examples. (2+2=4)
- Describe defects in Bohr's atomic model. (4)
 - Calculate the pH of a buffer solution in which 0.11 molar CH₃COONa and 0.09 molar acetic acid solutions are present. K_a for CH₃COOH is 1.85×10^{-5} . (4)
- Define bond energy. Discuss relation between ionic character and bond energy. (1+3=4)
 - What is a Galvanic cell? Draw diagram. Explain its electrodes with reactions occurring on electrodes. (1+1+2=4)
- Enlist colligative properties and why some properties are colligative? Also give conditions for observing colligative properties. (4)
 - Discuss any two factors affecting rate of reactions. (4)

Chemistry

H.S.S.C (11th) 1st Annual 2023

Time : 20 Minutes

Paper : I

Group: II

Objective – (iv)

Marks : 17

Paper Code

6

4

8

8

Note: - You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of that question number in your answer book. Use marker or pen to fill the circles. Cutting or filling up two or more circles will result no mark.

SECTION-A

Q.1	Questions	A	B	C	D
1.	Angle in water molecule is.	104.5°	107.5°	109.5°	120°
2.	(n+l) value for 5s orbital will be.	3	5	7	9
3.	The transition temperature of KNO ₃ is.	13.2 °C	95.6 °C	128 °C	32.05 °C
4.	Hydrogen bonding is maximum in.	H ₂ O	HCl	HBr	HI
5.	The comparative rates at which solute moves in paper chromatography depend upon.	The size of paper	R _f value of solute	Temperature of experiment	Size of chromatographic tank used
6.	A real gas obeying van der Waals equation will resemble ideal gas if.	Both (a) and (b) are large	Both (a) and (b) are small	(a) is small and (b) is large	(a) is large and (b) is small
7.	Critical temperature of water vapours is.	217.0 atm	111.5 atm	39.6 atm	73.0 atm
8.	The largest number of molecules are present in.	3.6g of H ₂ O	4.8g of C ₂ H ₅ OH	2.8g of CO	5.4g of N ₂ O ₅
9.	Isotopes differ in.	Properties which depend upon mass	Arrangements of electrons in orbitals	Chemical properties	The extent to which they may be affected in electromagnetic field
10.	Which of the given statements is not correct about galvanic cell.	Anode is negatively charged	Reduction occurs at anode	Cathode is positively charged	Reduction occurs at cathode
11.	All radioactive disintegration nuclear reactions are of.	First order	Second order	Third order	Zero order
12.	Oxidation number of 'Cl' in Ca(ClO ₃) ₂ is.	-1	+1	+5	-5
13.	The molal boiling point constant is the ratio of the elevation in boiling point to.	Molarity	Molality	Mole fraction of solvent	Mole fraction of solute
14.	The ionization constant of pure water at 25 °C is.	1.8x10 ⁻¹⁶ moles dm ⁻³	1.6x10 ⁻¹⁶ moles dm ⁻³	1.0x10 ⁻¹⁴ moles ² dm ⁻⁶	1.8x10 ⁻¹⁴ moles ² dm ⁻⁶
15.	Which aqueous solution has highest pH.	0.1M H ₂ SO ₄	0.1M NaOH	0.1M HCl	0.2M HNO ₃
16.	Which one is not state function?	Work	Internal energy	Enthalpy	Volume
17.	At constant volume q _v is equal to.	ΔH	ΔE	ΔP	ΔV

Chemistry

H.S.S.C (11th) 1st Annual 2023

Time : 2:40 Hours

Paper : I

Group: II

Subjective

Marks : 68

Note:- Section B is compulsory. Attempt any 3 questions from Section C.

SECTION-B

2. Write short answers to any Eight parts.

(8 x 2 = 16)

- 180g of glucose and 342g of sucrose have the same number of molecules but different number of atoms present in them. Give the reason.
- What is electrometer? Give its function in mass spectrometer.
- Calculate the mass in grams of 2.78×10^{21} molecules of CrO_2Cl_2 .
- State Avogadro's law of gases. Give an example.
- Give two characteristics of plasma.
- Define critical temperature. On what factors does it depend?
- State Pauli Exclusion Principle and Hund's rule.
- How is atomic emission spectrum obtained?
- What particles are formed by the decay of free neutron?
- What is meant by standard enthalpy of atomization? Give an example.
- Differentiate between spontaneous and non-spontaneous process.
- Why is it necessary to mention the physical states of the reactants and products in thermochemical equation?

3. Write short answers to any Eight parts.

(8 x 2 = 16)

- Define non ideal solution. Give example.
- How do you justify that NaCl and KNO_3 are used to lower the melting point of ice?
- Define molality. Give its equation.
- Differentiate between Rate and Rate Constant of a reaction.
- How does the increase of temperature increase the rate of the chemical reaction?
- Why the reaction having lower energies of activation have faster rates?
- Differentiate between stationary and mobile phase.
- Why is there a need to crystallize a crude product?
- Iodine is more soluble in water in the presence of KI . Give reason.
- Define transition temperature. Give example.
- What are the advantages of vacuum distillation?
- Why are the ionic crystals highly brittle?

4. Write short answers to any Six parts.

(6 x 2 = 12)

- What is meant by octet rule? Give one example.
- Fluoride has electron affinity less than the chloride. Give reason.
- Define electronegativity. Give its variation in periodic table.
- Enlist the ways to maximize the yield of ammonia in Haber's process.
- Briefly give the difference between reversible and irreversible reactions.
- How buffer solutions are prepared?
- Write down the oxidation states of oxygen in peroxide and super oxides.
- What is meant by ionization? Briefly explain.
- Write down the chemical equation for electrode processes of electrolysis of fused lead chloride.

SECTION-C

Note: Attempt any Three questions. Each question carries Eight (08) marks.

- Define STOICHIOMETRY. Write down its assumptions. (1+3=4)
 - Calculate the mass of 1dm^3 of NH_3 gas at 30°C and 1000 mm Hg pressure, considering that NH_3 is behaving ideally. (4)
- What are liquid crystals? Give their six uses in daily life. (4)
 - Describe how is the enthalpy of combustion (ΔH_c) of a substance measured by bomb calorimeter? (4)
- Define quantum numbers. Explain Azimuthal Quantum number in detail. (1+3=4)
 - N_2 and H_2 combine to give NH_3 . The value of K_c in this reaction at 500°C is 6.0×10^{-2} . Calculate the value of K_p for this reaction. (4)
- Define and explain electron affinity. Describe the factors influencing it. Also give its trends in periodic table. (4)
 - Explain lead accumulator. Also illustrate its discharging process. (4)
- State and explain Raoult's law when one component is non-volatile. (4)
 - Define order of a reaction and explain it with at least two examples. (4)

Chemistry

H.S.S.C (11th)-A-2022

Time : 20 Minutes

Paper : I

Group: II

Objective – (i)

Marks : 17

Ch-I/II

Paper Code 6 4 8 2

Note: - You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of that question number in your answer book. Use marker or pen to fill the circles. Cutting or filling up two or more circles will result no mark.

SECTION-A

Q.1	Questions	A	B	C	D
1.	The largest number of molecules are present in:	3.6g of H_2O	4.8g of C_2H_5OH	2.8g of CO	5.4g of N_2O_5
2.	The number of isotopes of Tin are:	9	11	6	3
3.	The drying agent used in vacuum desiccator is:	Silica gel	$NaCl$	$AgCl$	I_2
4.	Solvent extraction method is a particularly useful technique for separation when the product to be separated is:	Non-volatile or thermally unstable	Volatile or thermally stable	Non-volatile or thermally stable	Volatile or thermally unstable
5.	The deviation of a gas from ideal behaviour is maximum at:	$-10^\circ C$ and $5.0 atm$	$-10^\circ C$ and $2.0 atm$	$10^\circ C$ and $2.0 atm$	$0^\circ C$ and $2.0 atm$
6.	Equal masses of methane and oxygen are mixed in an empty container at $25^\circ C$. The fraction of total pressure exerted by oxygen is:	$\frac{1}{3}$	$\frac{8}{9}$	$\frac{1}{9}$	$\frac{16}{17}$
7.	When water freezes at $0^\circ C$, its density decreases due to:	Cubic structure of ice	Empty spaces present in the structure of ice	Change of bond lengths	Change of bond angles
8.	Acetone and chloroform are soluble in each other due to:	Intermolecular hydrogen bonding	Instantaneous dipole	Ion dipole interaction	Dipole-dipole forces
9.	When $6d$ orbital is complete, the entering electron goes into:		$7s$	$7p$	$7d$
10.	In the ground state of an atom, the electron is present:	In the nucleus	In the second shell	Nearest to the nucleus	Farthest from the nucleus
11.	The number of bonds in nitrogen molecule is:	One σ and one π	One σ and two π	Three sigma only	Two sigma and one π
12.	Which of the given species has unpaired electrons in anti-bonding molecular orbitals?	O_2^{2+}	N_2^{2-}	B_2	F_2
13.	The net heat change in a chemical reaction is same, whether it is brought about in two or more different ways in one or several steps. It is known as:	Henry's Law	Hess's Law	Joule's Principle	Law of Conservation of Energy
14.	An excess of aqueous $AgNO_3$ is added to aqueous $BaCl_2$ and precipitate is removed by filtration. What are the main ions in the filtrate?	Ag^+ and NO_3^- only	Ba^{2+} and NO_3^- only	Ag^+ , Ba^{2+} and NO_3^-	Ba^{2+} , NO_3^- and Cl^-
15.	18g glucose is dissolved in 90g of water. The relative lowering of vapour pressure is equal to:	$\frac{1}{5}$	5.1	$\frac{1}{51}$	6
16.	If a strip of Cu metal is placed in a solution of $FeSO_4$:	Cu will be deposited	Fe is precipitated out	Cu and Fe both dissolve	No reaction takes place
17.	The rate of reaction:	Increases as the reaction proceeds	Decreases as the reaction proceeds	Remains the same as the reaction proceeds	May decrease or increase as the reaction proceeds

Chemistry**H.S.S.C (11th)-A-2022**

Time : 2:40 Hours

Paper : I

Group: II

Subjective

Marks : 68

Note:- Section B is compulsory. Attempt any 3 questions from Section C.

SECTION-B

2. Write short answers to any Eight parts.

(8 x 2 = 16)

- Law of conservation of mass has to be obeyed during stoichiometric calculations. Justify.
- What do you mean by molar volume? Give an example.
- What is empirical formula? Give an example.
- Define Solvent Extraction and Partition Law.
- Differentiate between stationary and mobile phase.
- Define Sublimate. Give two examples.
- Explain that the process of respiration obeys the Dalton's law of partial pressure.
- What is Avogadro's law of gases?
- Derive the value of R when the pressure is in Nm^{-2} and volume in m^3 .
- What is the pH of a solution? Write formula to calculate pH of a solution.
- Write the effect of common ion on solubility. Give an example.
- Define Lowery Bronsted Concept of Acid and Base.

3. Write short answers to any Eight parts.

(8 x 2 = 16)

- What are dipole-dipole forces? Give example.
- Why ethane (C_2H_6) has higher boiling point than methane (CH_4).
- How fish and plants survive under ice for months in winter?
- Why evaporation causes cooling?
- Give two properties of cathode rays.
- How positive rays are produced?
- What are slow and fast neutrons?
- Why Rutherford's model failed?
- Define Molality. Give its equation.
- Differentiate between ideal and non-ideal solution in two aspects.
- Give two characteristics of enzyme catalysis.
- Define Auto Catalyst with an example.

4. Write short answers to any Six parts.

(6 x 2 = 12)

- Cationic radius is smaller than that of its parent atomic radius, why?
- Explain geometry of H_2S molecule on the basis of VSEPR theory.
- Define State and State Function.
- How electronegativity changes in a group?
- Define Co-ordinate covalent bond with a suitable example.
- Burning of a candle is a spontaneous process, justify.
- What do you mean by enthalpy of neutralization? Give a suitable example.
- What is the function of salt bridge?
- Define Standard Electrode Potential and how it is represented?

SECTION-C**(EACH QUESTION CARRIES EIGHT (8) MARKS)**

5. (a) Write a note on limiting reactant and explain by giving two examples.

(2+2)

(b) Write down postulates of Bohr's atomic model.

(4)

6. (a) Describe four applications of electrolysis processes of industrial importance.

(4)

(b) A gas having a volume of $10 dm^3$ is enclosed in a vessel at $0^\circ C$ and the pressure is 2.5 atm. This gas is allowed to expand until the new pressure is 2atm. What will be the new volume of this gas, if the temperature is maintained at 273K?

(4)

7. (a) How the enthalpy of combustion is measured out by bomb calorimeter?

(4)

(b) Draw out geometry of O_2 , N_2 according to M.O.T.

(4)

8. (a) What are liquid crystals? Give their three uses.

(1+3)

(b) The solubility of PbF_2 at $25^\circ C$ is $0.64 g dm^{-3}$. Calculate K_{sp} of PbF_2 .

(4)

9. (a) Explain the three statements of Raoult's law.

(4)

(b) How does Arrhenius equation help us to calculate the energy of activation of a reaction?

(4)

Chemistry

H.S.S.C (11th)-A-2022

Time : 20 Minutes

Paper : I

Group: I

Objective – (i)

Marks : 17

Ch-I/IV

Paper Code

Note: - You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of that question number in your answer book. Use marker or pen to fill the circles. Cutting or filling up two or more circles will result no mark.



SECTION-A

Q.1	Questions	A	B	C	D
1.	27g of Al will react completely with how much mass of O ₂ to produce Al ₂ O ₃ .	8g of oxygen	16g of oxygen	32g of oxygen	24g of oxygen
2.	The comparative rates at which the solutes move in paper chromatography, depends on:	The size of paper	R _f Values of salutes	Temperature of the experiment	Size of the chromatographic tank used
3.	During the process of crystallization, the hot saturated solution is:	Cooled very slowly to get large sized crystals	Cooled at a moderate rate to get medium sized crystals	Evaporated to get the crystals of the product	Mixed with an immiscible liquid to get the pure crystals of the product
4.	Which of the given will have same number of molecules at STP?	280cm ³ of CO ₂ and 280cm ³ of N ₂ O	11.2dm ³ of O ₂ and 32g of O ₂	44g of CO ₂ and 11.2dm ³ of CO ₂	28g of N ₂ and 5.6dm ³ of oxygen
5.	Acetone and chloroform are soluble into each other due to:	Intermolecular hydrogen bonding	Ion-dipole interaction	Instantaneous dipole	All of these
6.	Quantum number values for 2p orbitals are:	n=2, l=1	n=1, l=2	n=1, l=0	n=2, l=0
7.	The type of hybridization in molecule of ethene (CH ₂ =CH ₂) is:		sp ³	sp ²	dsp
8.	The change in heat energy of a chemical reaction at a constant temperature and pressure is called:	Enthalpy change	Bond energy	Heat of sublimation	Internal energy
9.	For which system, does the equilibrium constant K _c has units of (concentration) ⁻¹ ?	$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$	$H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$	$2NO_2(g) \rightleftharpoons N_2O_4(g)$	$2HF(g) \rightleftharpoons H_2(g) + F_2(g)$
10.	Colligative properties are the properties of:	Dilute solutions which behave as nearly ideal solutions	Concentrated solutions which behave as nearly non-ideal solutions	Both A and B	Neither A nor B
11.	The cathodic reaction in the electrolysis of dil. H ₂ SO ₄ with Pt electrode is:	Reduction	Oxidation	Both oxidation and reduction	Neither oxidation nor reduction
12.	The molar volume of CO ₂ is maximum at:	STP	127°C and 1 atm	0°C and 2 atm	273°C and 2 atm
13.	Which of the given pair do not show isomorphism?	NaNO ₃ , KNO ₃	ZnSO ₄ , NiSO ₄	Cu, Ag	NaCl, CuCl ₂
14.	Which one of the given compounds possess ionic bonding?	CaO	CH ₄	CH ₃ Cl	C ₂ H ₆
15.	Catalyst for a catalyst is also called:	Promotor	Inhibitor	Poisoning	Retarder
16.	The mass of one mole of electrons is:	1.008 mg	0.55 mg	0.184 mg	1.673 mg
17.	Which of the given sub-atomic particle does not show ionization?	Electron	Proton	Neutron	Alpha ray

Chemistry

H.S.S.C (11th)-A-2022

Time : 2:40 Hours

Paper : I

Group : I

Subjective

Marks : 68

Note: Section B is compulsory. Attempt any 3 questions from Section C.

SECTION-B

2. Write short answers to any Eight parts.

(8 x 2 = 16)

- Define Relative Atomic Mass also give two examples.
- How is the law of conservation of mass obeyed during stoichiometric calculations?
- Why do the isotopes have same chemical but different physical properties?
- State Distribution Law.
- How are coloured impurities removed from crystals?
- Write two uses of chromatography.
- Prove that $d = \frac{PM}{RT}$
- Calculate the value of R in SI units.
- Give two applications of plasma.
- What are buffers?
- What is the effect of common ion on solubility?
- How K_c determines the direction of chemical reaction?

3. Write short answers to any Eight parts.

(8 x 2 = 16)

- Evaporation takes place at all temperatures. Give reason.
- Iodine dissolves readily in tetrachloromethane. Give reason.
- Define Transition Temperature. Give an example.
- The electrical conductivity of the metals decreases by increasing temperature. Why?
- Why is e/m value of cathode rays just equal to that of electron?
- State Aufbau Principle.
- State Heisenberg's uncertainty principle. Give its mathematical form.
- Cathode rays are material particles. Justify it.
- The sum of mole fractions of all the components is always equal to unity for any solution. Justify it.
- What are conjugate solutions? Give an example.
- What is rate determining step? Give an example.
- Write two characteristics of enzyme catalysis.

4. Write short answers to any Six parts.

(6 x 2 = 12)

- Why Helium can not exist as diatomic molecule?
- Draw out Lewis structures of (i) BF_3 (ii) CH_4
- The distinction between co-ordinate covalent bond and a covalent bond vanishes after bond formation in NH_4^+ , explain.
- Why the dipole moment of CO_2 is zero?
- Define Standard Enthalpy of Formation with an example.
- Is it true, non-spontaneous process never happens in universe?
- Why burning of candle is spontaneous process?
- Find out oxidation state of Mn in $KMnO_4$.
- Why a salt bridge maintains electrical neutrality in the cell?

SECTION-C

(EACH QUESTION CARRIES EIGHT (8) MARKS)

- What is yield? Write its types. How will you calculate the percentage yield? (1+1+2)
 - What are quantum numbers? Give importance of azimuthal quantum number. (1+3)
- A gas having a volume of 10 dm^3 is enclosed in a vessel at 0°C and the pressure is 2.5 atm. This gas is allowed to expand until the new pressure is 2 atm. What will be the new volume of this gas, if the temperature is maintained at 273K? (4)
 - Write down four applications of electrochemical series. (4)
- Define hybridization and explain sp^2 hybridization by giving the example of ethene ($CH_2 = CH_2$) (1+2+1)
 - How the enthalpy of a reaction can be measured by using bomb calorimeter. (4)
- What is hydrogen bonding? Explain H-Bonding in biological compounds. (1+3)
 - The solubility of CaF_2 in water at 25°C is found to be 2.05×10^{-4} mole dm^{-3} . What is the value of K_{sp} at this temperature? (4)
- What is Raoult's law? Explain it by three ways. (4)
 - Define Order of Reaction. Give examples of some reactions explaining the order of reaction. (4)

Sahiwal Board-2021

Roll No.

(To be filled in by the candidate)

Chemistry

Inter (Part-I)-A-2021

Time : 20 Minutes

Paper : I

Objective – (II)

Marks : 17

Paper Code

Note: - You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of that question number in your answer book. Use marker or pen to fill the circles. Cutting or filling up two or more circles will result no mark.

Q.1	Questions	A	B	C	D
1	Mathematical expression of Raoult's law is:	$p \propto x_1$	$\Delta p \propto x_2$	$\frac{\Delta p}{p} = x_2$	all of these
2	For which system does the equilibrium constant K_c has units of (concentration) ⁻¹ ?	$N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$	$H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$	$2NO_{2(g)} \rightleftharpoons N_2O_{4(g)}$	$2HF_{(g)} \rightleftharpoons H_{2(g)} + F_{2(g)}$
3	The pH of $10^{-3} M$ of an aqueous solution of H_2SO_4 is:	3.0	2.7	2.0	1.5
4	1 kilo calorie is equivalent to:	0.4184 J	4184 J	4184 KJ	4.18 J
5	Most stable electronic configuration is of a/an:	Noble gas	Electronegative element	Alkali metal	Halogen
6	Which one of given is a linear molecule?	H_2O	HCN	Cl_2O	C_2H_4
7	Among the given e/m value is maximum for:	Oxygen	Nitrogen	Helium	Hydrogen
8	Quantum number values for 2p orbitals are:	$n=2, l=0$	$n=1, l=2$	$n=2, l=1$	$n=1, l=0$
9	Among the given H-Bonding is maximum in:	Alcohol	Benzene	Water	Diethyl ether
10	In chloroform and acetone, how many chlorine atoms are responsible for hydrogen bonding?	1	2	3	4
11	At what temperature does the gaseous state of any type of matter can't exist?	$-33^\circ C$	$273.15^\circ C$	$-273.15^\circ C$	$-237.15^\circ C$
12	Density of an ideal gas can be calculated by using equation:	$PV = dRT$	$PM = dPV$	$d = \frac{RT}{MP}$	$PM = dRT$
13	Solvent extraction is an equilibrium process and it is controlled by:	law of mass action	the amount of solvent used	distribution law	the amount of solute
14	27g of Al reacts completely with how much mass of O_2 to produce Al_2O_3 .	8g of oxygen	16g of oxygen	32g of oxygen	24g of oxygen
15	Isotopes differ in:	properties which depends upon mass	arrangement of electrons in orbital	chemical properties	the extent to which they may be effected in electromagnetic field
16	If rate equation of a reaction is $2A + B \rightarrow$ product, its rate equation is, $rate = k[A]^2[B]$, and A is in large excess, the order of reaction is:	1	2	3	1.5
17	Stronger the oxidizing agent, greater is the:	Oxidation potential	Reduction potential	Redox potential	emf of the cell

Note: Section I is compulsory. Attempt any 3 questions from Section II.

(SECTION-I)

2. Write short answers to any Eight parts.

(8 x 2 = 16)

- i. Explain with reason N_2 and CO have the same number of electrons, protons and neutrons.
- ii. Why in experimental work one or more reactants is/are deliberately used in excess quantity?
- iii. Law of Conservation of Mass has to be obeyed during stoichiometric calculations. Explain.
- iv. Define Distribution Coefficient.
- v. What is difference between partition and adsorption type chromatography?
- vi. Write quantitative definition of Charles's law.
- vii. Calculate the values of R (general gas constant) in SI system.
- viii. State Avogadro's law by giving example.
- ix. Non-ideal solutions do not obey Raoult's law. Explain with reason.
- x. Explain with reason that the relative lowering of vapour pressure is independent of temperature.
- xi. Define Cryoscopic Constant.
- xii. What is Future Horizon of plasma?

3. Write short answers to any Eight parts.

(8 x 2 = 16)

- i. How soaps perform their cleansing action?
- ii. What are amorphous solids? Give examples.
- iii. What is Anisotropy?
- iv. Define Symmetry of Crystal.
- v. What is principal quantum number?
- vi. Define Quantum Numbers.
- vii. What is azimuthal quantum number?
- viii. What is basic idea of Planck's quantum theory?
- ix. Define Common Ion Effect with one example.
- x. Define Buffer Solutions.
- xi. What is half-life period?
- xii. Define Order of a Reaction.

4. Write short answers to any Six parts.

(6 x 2 = 12)

- i. Write names of factors affecting electron affinity.
- ii. How does Shielding effect affect ionization energy?
- iii. Define Polar Covalent Bond giving one example.
- iv. Give two examples of coordinate covalent bond.
- v. Define Enthalpy of atomization with one example.
- vi. What is the first Law of Thermodynamics?
- vii. Write reactions involved in extraction of Sodium in Down's Cell.
- viii. Discuss in brief Standard Hydrogen Electrode.
- ix. What is function of salt bridge?

(SECTION-II)**(Each question carries Eight (4+4=8) Marks)**

5. (a) Calculate the number of grams of K_2SO_4 and water produced when 14g of KOH are reacted with excess of H_2SO_4 . Also calculate the number of molecules of water produced.
(b) What are Liquid Crystals? Give their uses in daily life.
6. (a) State and explain Charles's law, alongwith its experimental verification.
(b) Explain Atomic or Line spectrum.
7. (a) Define Co-ordinate Covalent Bond and explain with two suitable examples.
(b) Describe the measurement of enthalpy of a reaction by bomb calorimeter.
8. (a) $N_2(g)$ and $H_2(g)$ combine to give $NH_3(g)$. The value of K_c in this reaction is 6.0×10^{-2} at $500^\circ C$. Calculate the value of K_p .
(b) Explain Energy of Activation.
9. (a) What is Raoult's law? Give its three statements.
(b) Explain the term oxidation number with two examples.

(INTERMEDIATE PART-I) (IV)

Chemistry (New Scheme)

(Objective)

pakcity.org

Paper : 1

Time: 20 Minutes

Code : 6487

Marks : 17

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

- Which of the following is a pseudo solid?
(A) CaF_2 (B) Glass (C) $NaCl$ (D) $AgNO_3$
- When water freezes at $0^\circ C$, its density decreases due to:
(A) cubic structure of ice (B) change of bond length
(C) empty spaces present in the structure of ice (D) change of bond angles
- The molar volume of CO_2 is maximum at:
(A) STP (B) $127^\circ C$ and 1 atm (C) $0^\circ C$ and 2 atm (D) $273^\circ C$ and 2 atm
- Pressure remaining constant, at which temperature the volume of the gas will become twice of what it is at $0^\circ C$:
(A) $546^\circ C$ (B) $200^\circ C$ (C) $546K$ (D) $273K$
- Solvent extraction is an equilibrium process and it is controlled by:
(A) law of mass action (B) the amount of solvent used
(C) distribution law (D) the amount of solute
- The volume occupied by 1.4 g of N_2 at S.T.P is:
(A) $2.24dm^3$ (B) $22.4dm^3$ (C) $1.12dm^3$ (D) $112dm^3$
- The mass of one mole of electrons is:
(A) 1.008 mg (B) 0.55 mg (C) 0.184 mg (D) 1.673 mg
- If the rate equation of a reaction $2A+B \rightarrow \text{products}$ is, $\text{rate} = k[A]^2[B]$, and A is present in large excess, then order of reaction is:
(A) 1 (B) 2 (C) 3 (D) 4
- The cathodic reaction in the electrolysis of dil. H_2SO_4 with Pt electrode is:
(A) reduction (B) oxidation (C) both oxidation and reduction (D) neither oxidation nor reduction
- The molal boiling point constant is the ratio of the elevation in boiling point to :-
(A) molarity (B) molality (C) mole fraction of solvent (D) mole fraction of solute
- Molarity of pure water is :
(A) 1 (B) 18 (C) 55.5 (D) 6
- An excess of aqueous silver nitrate is added to aqueous barium chloride and precipitate is removed by filtration. What are the main ions in the filtrate?
(A) Ag^+ and NO_3^- only (B) Ag^+ and Ba^{2+} and NO_3^- (C) Ba^{2+} and NO_3^- only (D) Ba^{2+} and NO_3^- and Cl^-
- For a given process the heat changes at constant pressure (q_p) and at constant volume (q_v) are related to each other as:
(A) $q_p = q_v$ (B) $q_p < q_v$ (C) $q_p > q_v$ (D) $q_p = \frac{q_v}{2}$
- Which of the following species has unpaired electrons in antibonding molecular orbitals?
(A) O_2^{2+} (B) N_2^{2-} (C) B_2 (D) F_2
- Which of the following molecules has zero dipole moment?
(A) NH_3 (B) $CHCl_3$ (C) H_2O (D) BF_3
- Splitting of spectral lines when atoms are subjected to strong electric field is called:
(A) zeeman effect (B) stark effect (C) photoelectric effect (D) Compton effect
- When 6d orbital is complete, the entering electron goes into:
(A) 7f (B) 7s (C) 7p (D) 7d

Physics (New Scheme)

(INTER PART -I - CLASS 11th)

Time: 2.40 Hours

Paper : I

SUBJECTIVE

Marks : 68

Note:- Section I is compulsory. Attempt any 3 questions from Section II.

(Section – I)

2. Write short answers to any Eight parts.

(8 x 2 = 16)

- i. Give the drawbacks to use the period of simple pendulum as time standards.
- ii. How the digit 5, if insignificant, will be rounded off?
- iii. Define the terms (i) Unit Vector (ii) Position Vector and write their mathematical expressions.
- iv. Is it possible to add a vector quantity to a scalar quantity? Explain.
- v. How would the two vectors of the same magnitude have to be oriented, if they were to be combined to give the resultant equal to a vector of the same magnitude?
- vi. Calculate the work done in kilo joules in lifting a mass of 10 kg (at a steady velocity) through vertical height of 10 m?
- vii. What sort of energy is in the following ?
(a) compressed spring (b) a moving car
- viii. A person is standing near a fast moving train. Is there any danger that he will fall towards it?
- ix. In an orbiting space station, would the blood pressure in major arteries in the legs ever be greater than the blood pressure in major arteries in the neck?
- x. What is meant by phase angle? Does it define the angle between maximum displacement and the driving force?
- xi. Differentiate between Resonance and Damping.
- xii. Under what conditions does the addition of two simple harmonic motions produce a resultant, which is also simple harmonic?

3. Write short answers to any Eight parts.

(8 x 2 = 16)

- i. State Law of Conservation of Momentum. What is its limitation?
- ii. Explain the circumstances in which the velocity \vec{v} and acceleration \vec{a} are parallel and anti parallel.
- iii. If angle of projection of a projectile is 90° . Find its range.
- iv. How can acceleration be found by velocity- time graph?
- v. What is meant by weightlessness?
- vi. Prove that orbital angular momentum depends upon the radius of the orbit.
- vii. What is meant by moment of inertia? Explain its significance.
- viii. Derive relation $S = r\theta$.
- ix. What do you know about radar speed trap?
- x. What are the quantities which affect the frequency of standing waves along a string?
- xi. What are the conditions for points which are in phase and out of phase?
- xii. As we know $PV^\gamma = \text{Constant}$. What do you know about γ in this relation?

(Turn over)

(INTERMEDIATE PART - I) (III)

Chemistry (New Scheme) (Academic Session 2017-2018)

Paper :
Marks : 1

Time: 20 Minutes

Code : 6485 (Objective)

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

I- i. Number of bonds in N_2 molecule are :

- (A) one σ and 2π (B) one σ and one π (C) three σ only (D) 2 σ and one π

ii. Name the electron is given by:

- (A) William Crooks (B) Stoney (C) J.J. Thomson (D) Chadwick

iii. Bohr's model of atom is contradicted by:

- (A) Plank's quantum theory (B) Heisenberg uncertainty principle
(C) Dual Nature of matter (D) Rutherford atomic model

iv. Molecules of CO_2 in dry ice form the :

- (A) molecular crystals (B) ionic crystals (C) metallic crystals (D) covalent crystals

v. Which one of the following is in liquid state at room temperature?

- (A) Methane (B) Ethane (C) Hexane (D) Propane

vi. The spreading of fragrance of scent is due to:

- (A) Osmosis (B) Density (C) Effusion (D) Diffusion

vii. The drying agent used in desiccator is:

- (A) NH_4Cl (B) $AgCl$ (C) $NaCl$ (D) $CaCl_2$

viii. Mass of one mole of electrons is :

- (A) 1.008 mg (B) 0.184 mg (C) 0.55 mg (D) 1.673 mg

ix. Which one of the following is a molecular ion:

- (A) SO_4^{2-} (B) CH_4 (C) Mg^{2+} (D) K^+

x. The enzyme used for hydrolysis of urea is

- (A) urease (B) invertase (C) lipase (D) Zymase

xi. Cathode in NICAD cell is of

- (A) Ag_2O (B) Zn (C) Cd (D) NiO_2

xii. A solution of glucose is 10%, the volume to which 1 gm/mole of it dissolved will be

- (A) $1dm^3$ (B) $200cm^3$ (C) $1.8dm^3$ (D) $900cm^3$

xiii. Which of the following concentration unit is temperature dependent?

- (A) molality (B) molarity (C) mole fraction (D) percentage w/w

xiv. The units of K_c for the reaction of ammonia synthesis are

- (A) $moles^{-2}dm^6$ (B) $moles^{-1}dm^6$ (C) $moles^{-2}dm^3$ (D) $moles^{-2}dm^2$

xv. The term pH was introduced by

- (A) Henderson (B) Millikan (C) Le-chattilier (D) Sorenson

xvi. For the reaction $NaOH + HCl \rightarrow NaCl + H_2O$, the change in enthalpy is called

- (A) heat of neutralization (B) heat of reaction (C) heat of formation (D) heat of combustion

xvii. Which one of the following molecule do not obey the Octet rule?

- (A) CH_4 (B) CO_2 (C) PF_5 (D) CS_2

Subjective

Note :- Section I is compulsory. Attempt any three (3) questions from Section II.

(Section I)

2. Write short answers to any Eight Parts. (8 x 2 = 16)

- i. Mg atom is twice heavier than that of a carbon atom. How?
- ii. Why 23 g of 'Na' and 238 g of uranium have equal number of atoms?
- iii. Define limiting reactant with an example.
- iv. Why is there a need to crystallize a crude product?
- v. Give two uses of chromatography.
- vi. Describe two causes of deviation of gases from ideality.
- vii. Pilots feel un-comfortable in breathing at high altitude. Why?
- viii. Give unit of Vander walls constant 'a' and 'b'.
- ix. What is the ionization constant of acid?
- x. What is the effect of catalyst on equilibrium constant?
- xi. What is the effect of common ion on solubility?
- xii. Define acids and bases by Lowry- Bronsted concept.

3. Write short answers to any Eight parts. (8 x 2 = 16)

- i. One feels sense of cooling under the fan after bath, explain with reason. .
- ii. What are liquid crystals? Who discovered it?
- iii. Ionic crystals do not conduct electricity in the solid state, give reason.
- iv. Explain the term ' Anisotropy' with an example.
- v. Write the Lewis structures for the given compounds:. (a) HCN (b) CS₂
- vi. Explain the formation of coordinate covalent bond between NH₃ and BF₃
- vii. π - bonds are More diffused than sigma bond, give reason.
- viii. NH₃ and BF₃ are tetra atomic but different geometries, why?
- ix. Explain the term "Atomization energy" with an example.
- x. What is internal energy? What is effect of increase in internal energy on the system?
- xi. Define mole fraction; also give its mathematical expression.
- xii. Explain the term hydrolysis with an example.

Sahiwal Board-2018

4. Write short answers to any Six parts. (2 x 6 = 12)
- Calculate potential energy of an electron at a distance "r" from a nucleus.
 - Define Moseley's Law and give its mathematical equation.
 - Define $(n+l)$ rule and Pauli's Exclusion principle.
 - Distribute electrons in orbital of Cu with atomic number 29.
 - Write down electrode reactions occurring during electrolysis of aqueous sodium Nitrate.
 - Explain Alkaline battery giving its electrode reactions.
 - Give differences between electrolytic cell and voltaic cell.
 - Explain mechanism of enzyme catalysis with diagram, briefly.
 - How does nature of reactants affect rate of reaction, give an example.

(Section - II)

Note: Attempt any three (3) questions from Section II. Each question carries 08 marks. (3 x 8 = 24)

5. (a) A well known ideal gas is enclosed in a container having volume 500 cm^3 at S.T.P. Its mass comes out to be 0.72 g. What is the molar mass of this gas?
- (b) Define vapour pressure. How is vapour pressure measured by Manometric method?
6. (a) Write down eight postulates of Kinetic Molecular theory of gases.
- (b) Explain Millikan's oil drop experiment to determine the charge of an electron.
7. (a) Define electronegativity. How does it vary in periodic table? And also discuss its effect on bond strength.
- (b) Prove that, $\Delta H = q_p$
8. (a) What is the common ion effect? Describe it with an example and give its two applications in salt analysis with two examples.
- (b) Describe (i) silver oxide battery (ii) Nickel Cadmium cell
9. (a) Hydrochloric acid available in the laboratory is 36 % (w/w). The density of HCl solution is 1.19 g cm^{-3} . Determine the Molarity of HCl solution.
- (b) How energy of activation can be determined from Arrhenius equation.