Paper Code Number: 2481		2024 (1st-A) INTERMEDIATE PART-I (11th Class)		Roll No: _____	
CHEMISTRY PAPER-I GROUP-I					
TIME ALLOWED: 20 Minutes		OBJECTIVE		MAXIMUM MARKS: 17	

Q.No.1 You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.

S.#	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 to N_2O_5
2	The number of isotopes of nickel are:	1	3	5 ●	7
3	Iodine dissolved in water in presence of KI is due to formation of given species:	I_2	I'	I_4^{-1}	I_3^{-1} ●
4	The comparative rates at which solute moves in paper chromatography depends on:	Size of paper	R_f value of solute ●	Temperature of experiment	Size of chromatographic tank
5	Which of given will have highest rate of diffusion?	O_2	CO_2	NH_3 ●	SO_2
6	Molar volume of CO_2 is maximum at:	S.T.P	127^oC and 1 atm ●	0^oC and 2 atm	273^oC and 2 atm
7	At Murree hills water boils at:	98^oC ●	100^oC	0^oC	50^oC
8	The molecules of CO_2 in dry ice form the:	Ionic crystals	Covalent crystals	Molecular crystals ●	Any type of crystals
9	Orbitals having same energy are called:	Hybrid orbitals	Valence orbitals	d-orbitals	Degenerate orbitals ●
10	The nature of positive rays depends upon:	The nature of electrodes	Nature of discharge tube	The nature of residual gas ●	All of these
11	Which of given species has unpaired electrons in anti-bonding molecular orbitals?	N_2^{-2} ●	O_2^{+2}	B_2	F_2
12	The bond order of N_2 molecule according to Molecular Orbital Theory is:	Zero	01	02	03 ●
13	For a given process the heat changes at constant pressure(q_p) and at constant volume(q_v) are related to each other as:	$q_p = q_v$	$q_p < q_v$	$q_p > q_v$ ●	$q_p = \dfrac{q_v}{2}$
14	pH of pure water is:	7.0 ●	5.4	4.4	8.0
15	Molarity of pure water is:	1	18	55.5 ●	6
16	If salt bridge is not used between two half cells then the voltage:	Decreases rapidly	Decreases slowly	Does not change	Drops to zero ●
17	The unit of rate constant is same as that of rate of reaction in:	First order reaction	Second order reaction	Zero order reaction ●	Third order reaction

21(Obj)(☆)-2024(1st-A)-20000   **(MULTAN)**

CHEMISTRY PAPER-I GROUP-I

| TIME ALLOWED: 2.40 Hours | SUBJECTIVE | MAXIMUM MARKS: 68 |

NOTE: Write same question number and its parts number on answer book, as given in the question paper.

SECTION-I

2. Attempt any eight parts. $8 \times 2 = 16$

(i)	Differentiate between ion and molecular ion.
(ii)	What are macromolecules? Give an example.
(iii)	What is justification of two strong peaks in the mass spectrum for bromine while for iodine only one peak at 127 a.m.u is indicated?
(iv)	Define sublimation. Give two examples.
(v)	Give two applications of paper chromatography.
(vi)	What do you mean by distribution coefficient?
(vii)	What is absolute zero?
(viii)	Give two conditions when gases deviate from ideal behaviour.
(ix)	Joule Thomson effect produces cooling. How?
(x)	How can direction of a reversible reaction be predicted by K_C?
(xi)	Define Buffer capacity.
(xii)	Give two applications of solubility product.

3. Attempt any eight parts. $8 \times 2 = 16$

(i)	Why boiling point of H_2O is greater than HF?
(ii)	Evaporation causes cooling. Justify.
(iii)	What is habit of crystal? What is the effect of impurity on shape of crystal?
(iv)	Define Allotropy. Write names of two elements showing allotropy.
(v)	Why positive rays are called canal rays?
(vi)	How dual nature of matter was got verified by Davison and Germer experimentally?
(vii)	How slow neutrons are used to carry out radioactive reactions by emitting gamma radiations?
(viii)	Cathode rays travel in a straight line. Justify with diagram.
(ix)	What is the effect of temperature on phenol-water system?
(x)	Why $AlCl_3$ and $CuSO_4$ give acidic solution in water? Give chemical equation of each.
(xi)	What is dilatometric and refractrometric method for the determination of concentration of reactant?
(xii)	What is activation of catalyst?

4. Attempt any six parts. $6 \times 2 = 12$

(i)	What is dipole moment? Give its various units.
(ii)	What is octet rule? Give two examples of compounds which deviate from it?
(iii)	Write the Lewis structures for (i) CS_2 (ii) HCN
(iv)	How do you compare the bond strengths of polar and non-polar molecules?
(v)	Justify that the burning of a candle is a spontaneous process.
(vi)	Define state and state functions with examples.
(vii)	Differentiate between heat and temperature.
(viii)	A salt bridge maintains the electrical neutrality in the cell. Why?
(ix)	Calculate the oxidation number of "S" in $Cr_2(SO_4)_3$.

SECTION-II

NOTE: Attempt any three questions. $3 \times 8 = 24$

5.(a)	Define and differentiate between actual and theoretical yield. Explain why actual yield is usually less than theoretical yield.	1+1+2=4
(b)	Describe with the help of diagram the monometric method for the measurement of vapour pressure.	3+1=4
6.(a)	$250cm^3$ of the sample of hydrogen effuses four times as rapidly as $250cm^3$ of a unknown gas. Calculate the molar mass of unknown gas.	4
(b)	State and explain main points of Planck's quantum theory.	4
7.(a)	What is ionization energy? Discuss the variation of ionization energy in the periodic table.	4
(b)	The solubility product of Ag_2CrO_4 is 2.6×10^{-2} at $25^o C$. Calculate the solubility of the compound.	4
8.(a)	Explain the glass calorimetric method for the measurement of enthalpy of reaction.	4
(b)	Define standard electrode potential. Explain the measurement of electrode potential of copper.	4
9.(a)	Explain Beckmann's Method for measuring depression in freezing point.	4
(b)	Explain the effect of temperature on the rate constant of a reaction by "Arrhenius Equation".	4

21-2024(1ˢᵗ-A)-20000 **(MULTAN)**

Paper Code Number: 2482	2024 (1ˢᵗ-A) INTERMEDIATE PART-I (11ᵗʰ Class)		Roll No: _____

CHEMISTRY   PAPER-I   GROUP-II

TIME ALLOWED: 20 Minutes	OBJECTIVE	MAXIMUM MARKS: 17

Q.No.1 You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.

S.#	QUESTIONS	A	B	C	D
1	The number of isotopes of tin(Sn) is:	Six	Nine	Eleven ●	Three
2	27g of Al will react 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 ●
3	A complete quantitative analysis consists of how many major steps:	Two	Five	Four ●	Three
4	Solvent extraction method is 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 melting point of ice on Kelvin Scale, at 1 atmospheric pressure is:	273K ●	373K	0K	-273 K
6	Equal masses of methane and oxygen are mixed in an empty container at 25^oC. The fraction of total pressure exerted by oxygen is:	$\frac{1}{9}$	$\frac{8}{9}$	$\frac{1}{3}$ ●	$\frac{16}{17}$
7	In order to maintain the boiling point of water at 110^oC, the external pressure should be:	Between 200 torr and 760 torr	Between 760 torr and 1200 torr ●	765 torr	Any value of torr
8	Ionic solids are characterized by:	Low melting points	Good conductivity in solid state	High vapour pressure	Solubility in polar solvents ●
9	Splitting of spectral lines when atoms are subjected to strong electric field is called:	Zeeman effect	Stark effect ●	Compton effect	Photoelectric effect
10	Quantum number values for 2p orbitals are:	$n=2, \ell=1$ ●	$n=1, \ell=2$	$n=1, \ell=0$	$n=2, \ell=0$
11	The most electronegative element of the periodic table is:	Chlorine	Bromine	Fluorine ●	Iodine
12	Which molecule shows linear molecular geometry?	CH_4	$AlCl_3$	H_2O	$BeCl_2$ ●
13	Calorie is equivalent to:	0.4184 J	41.8 J	4.18 J ●	418.4 J
14	The solubility product of $AgCl$ is 2.0×10^{-10} $mole^2 dm^{-6}$. The maximum concentration of Ag^+ ions in the solution is:	2.0×10^{-10} $mole\,dm^{-3}$ ●	1.41×10^{-5} $mole\,dm^{-3}$	1.0×10^{-10} $mole\,dm^{-3}$	4.0×10^{-20} $mole\,dm^{-3}$
15	A solution of glucose is 10% w/v. The volume in which 1g mole of it is dissolved will be:	$1.8\,dm^3$ ●	$1\,dm^3$	$200\,cm^3$	$900\,cm^3$
16	If the salt bridge is not used between two half cells, the voltage:	Decreases rapidly	Decreases slowly	Does not change	Drops to zero ●
17	With increase of 10^oC temperature, the rate of reaction doubles. This increase in rate of reaction is due to:	Decrease in activation energy of reaction	Decrease in the number of collisions between reactant molecules	Increase in effective collisions ●	Increase in activation energy of reactants

CHEMISTRY PAPER-I GROUP-II		
TIME ALLOWED: 2.40 Hours	**SUBJECTIVE**	**MAXIMUM MARKS: 68**

NOTE: Write same question number and its parts number on answer book, as given in the question paper.

SECTION-I

2. Attempt any eight parts. $8 \times 2 = 16$

(i) What is the principle of mass spectrometry?

(ii) $23g$ of sodium and $238g$ of uranium have equal number of atoms in them. Give the reason.

(iii) Define gram atom. Give two examples.

(iv) What is R_f value? Give its formula.

(v) Write down the four main characteristics of the solvent used for crystallization.

(vi) What is solvent extraction? Give its importance.

(vii) Gases deviate more significantly at high pressure and low temperature. Why?

(viii) How do you differentiate between effusion and diffusion of gases?

(ix) Derive Graham's law of diffusion from kinetic molecular theory of gases.

(x) Give two applications of common ion effect.

(xi) Why do the equilibrium constant value has its units for some of the reversible reactions but has no units for some other reactions?

(xii) How can we prepare acidic buffers? Give an example.

3. Attempt any eight parts. $8 \times 2 = 16$

(i) Why water is liquid but hydrogen sulphide is gas at room temperature?

(ii) How dynamic equilibrium is established in a close vessel?

(iii) Why molar heat of vapourization is greater than molar heat of fusion?

(iv) Why liquid crystals are used as temperature sensors?

(v) Write reason for production of positive rays.

(vi) How will you justify that cathode rays move in straight line?

(vii) Write any two postulates of Plank's Quantum Theory.

(viii) Calculate wave number of second spectral line of Balmer series.

(ix) $NaCl$ and KNO_3 are used to lower the melting point of ice. Why?

(x) Why non-ideal solutions do not obey Raoult's law?

(xi) Differentiate between rate of reaction and rate constant of a reaction.

(xii) What is heterogenous catalysis? Give an example.

4. Attempt any six parts. $6 \times 2 = 12$

(i) Impure copper can be purified by electrolytic process. Explain by giving reason.

(ii) Calculate the oxidation number of underlined elements $\underline{Cr}_2(SO_4)_3$; $Na_2\underline{C}O_3$

(iii) What is Thermochemistry? Give examples.

(iv) Define enthalpy of reaction. Give example.

(v) In case of liquids and solids system $\Delta H \approx \Delta E$. Explain.

(vi) Bond distance is the compromise distance between two atoms. Explain with reason.

(vii) The melting points of electrovalent compounds are higher than covalent compounds. Explain with reason.

(viii) There is no bond in chemistry with 100% ionic character. Explain.

(ix) The atomic radius cannot be measured precisely. Explain with reason.

SECTION-II

NOTE: Attempt any three questions. $3 \times 8 = 24$

5.(a)	Define stoichiometry. Write two assumptions of stoichiometry. Give example.	4
(b)	Define boiling point. Explain effect of external pressure on boiling point.	4
6.(a)	Calculate the mass of $1 \, dm^3$ of NH_3 gas at $30^0 C$ and $1000 \, mm \, Hg$ pressure considering that NH_3 behaving ideally.	4
(b)	Differentiate between atomic emission and atomic absorption spectrum with diagram.	4
7.(a)	What is paramagnetic character? Give the reason for paramagnetic character of oxygen (O_2) through orbital picture.	4
(b)	The solubility of CaF_2 in water at $25^0 C$ is found to be $2.05 \times 10^{-4} \, mol \, dm^{-3}$. What is the value of K_{sp} at this temperature?	4
8.(a)	Explain construction and working of Bomb calorimeter. Write also formula to calculate q.	3+1=4
(b)	Define electrochemical series. Write its any two applications.	1+3=4
9.(a)	What do you mean by elevation of boiling point? Explain Landsberger's method for its measurement.	4
(b)	Discuss Half Life Method and method of large excess to find order of a reaction.	2+2=4

22-2024(1ˢᵗ-A)-24000 (MULTAN)

CHEMISTRY   PAPER-I   GROUP-I   Multan Board-2023

TIME ALLOWED: 20 Minutes	OBJECTIVE	MAXIMUM MARKS: 17

Q.No.1 You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.

S.#	QUESTIONS	A	B	C	D
1	Pressure remaining constant at which temperature the volume of a gas will become twice of what it is at $0°C$:	$200°C$	$546K$	$546°C$	$273K$
2	The deviation of a gas from ideal behaviour is maximum at:	$-10°C$ and 5.0atm	$-10°C$ and 2.0 atm	$100°C$ and 2.0 atm	$0°C$ and 2.0 atm
3	Glycerin boils at $210°C$ when external pressure is:	760 torr	500 torr	100 torr	50 torr
4	Diamond is bad conductor because:	It has a tight structure	It has a high density	There are no free electron present in the crystal of diamond to conduct electricity	Is transparent to light
5	Quantum number values for $2p$ orbitals are:	$n=1, \ell=2$	$n=2, \ell=1$	$n=1, \ell=0$	$n=2, \ell=0$
6	Which of the following molecule has zero dipole moment?	CO_2	H_2O	HI	$CH_3C\ell$
7	One calorie is equivalent to:	$0.4184 J$	$418.4 J$	$41.84 J$	$4.184 J$
8	The study of heat changes accompanying a chemical reaction is known as:	Chemistry	Thermochemistry	Physical chemistry	Biochemistry
9	The pH of 10^{-3} mol dm⁻³ an aqueous solution of HCl is:	3.0	2.0	2.7	1.5
10	pH of soft drinks is approximately:	1.5	1.0	2.0	3.0
11	An aqueous solution of ethanol in water may have vapour pressure:	Equal to that of water	Equal to that of ethanol	More than that of water	Less than that of water
12	Oxidation number of all elements in free state is:	Zero	$+1$	$+2$	-1
13	If the salt bridge is not used between two half cells, then the voltage:	Decrease rapidly	Decrease slowly	Does not change	Drops to zero
14	If the rate equation of a reaction $2A + B \rightarrow$ products is, rate = $K[A]^2[B]$ and A is present in large excess, then the order of reaction is:	01	02	03	04
15	Empirical formula of glucose is:	CH_2O	$C_2H_4O_2$	$C_6H_{12}O_6$	$C_2H_2O_2$
16	One mole of SO_2 contains:	6.02×10^{23} atoms of oxygen	18.1×10^{23} molecules of SO_2	4 gram atoms of SO_2	6.02×10^{23} atoms of sulphar
17	Which of the following is used as decolourizing agent in crystallization?	H_2SO_4	Graphite	Animal charcoal	H_2O

NOTE: Write same question number and its parts number on answer book, as given in the question paper.

SECTION-I

2. Attempt any eight parts. $8 \times 2 = 16$

(i)	No individual neon atom in the sample of the element has a mass of 20.18 amu.
(ii)	Many chemical reactions taking place in our surrounding involve the limiting reactants. Justify.
(iii)	180g of glucose and 342g of sucrose have the same number of molecules but different number of atoms present in them. Why?
(iv)	Justify that $1\,cm^3$ of H_2 and $1\,cm^3$ of CH_4 at STP will have same number of molecules, when one molecule of CH_4 is 8 times heavier than that of hydrogen.
(v)	Why do we feel comfortable in expressing the densities of gases in the units of $g\,dm^{-3}$ rather than $g\,cm^{-3}$?
(vi)	Water vapours do not behave ideally at 273K. Why?
(vii)	Do you think that the size of Li^{+2} is even smaller than He^{+}? Justify it.
(viii)	Distribute electrons in orbitals of $_{24}Cr$, $_{13}Al$.
(ix)	The e/m value for positive rays obtained from hydrogen gas is 1836 times less than that of Cathode rays. Justify it.
(x)	What is meant by standard enthalpy of neutralization? Give one example.
(xi)	Prove that $q_v = \Delta E$
(xii)	Differentiate between system and surrounding with one example for each.

3. Attempt any eight parts. $8 \times 2 = 16$

(i)	Write down factors affecting relative lowering of vapour pressure.	2
(ii)	Define Solubility. What are Solubility Curves? Give names only.	1 + 1
(iii)	In $CuSO_4.5H_2O$, four water molecules are attached with Cu^{2+} ion while one water molecule with SO_4^{2-} ion. Give reason.	2
(iv)	What is Instantaneous and Average Rate of reaction?	1 + 1
(v)	Write Spectrometry and Optical Rotation Method for the determination of rate of reaction.	1 + 1
(vi)	Define Catalysis. Give only one characteristic of catalyst.	1 + 1
(vii)	How rate of filtration can be increased?	1 + 1
(viii)	What is safe and reliable method for drying the crystals?	2
(ix)	Define Distribution Law. What is distribution coefficient?	1 + 1
(x)	Evaporation causes cooling. Justify.	2
(xi)	Why electrical conductivity of metallic solids decreases by increasing temperature?	2
(xii)	What is cubic close packing and hexagonal close packing?	1 + 1

4. Attempt any six parts. $6 \times 2 = 12$

(i)	Why Helium does not exist in diatomic form?
(ii)	What is Coordinate Covalent Bond? Give one example.
(iii)	Justify that Covalent Bonds in directional in nature.
(iv)	What is Common Ion Effect?
(v)	What is Buffer Capacity?
(vi)	What is pK_a? Give its significance.
(vii)	Define Electrochemistry.
(viii)	Calculate the oxidation number of Mn in $KMnO_4$.
(ix)	Define Electrolytic Conduction.

SECTION-II

NOTE: Attempt any three questions. $3 \times 8 = 24$

5.(a)	What is stoichiometry? Give assumptions mention two important laws which help to perform the stoichiometric calculations.	4
(b)	There is a mixture of hydrogen, helium and methane occupying a vessel of volume $13\,dm^3$ at $37°C$ and pressure of 1 atmosphere. The masses of hydrogen and helium are 0.8g and 0.12g respectively. Calculate the partial pressures in torr of each gas in the mixture.	4
6.(a)	What are Liquid Crystals? Give their three uses in daily life.	1 + 3 = 4
(b)	State First Law of Thermodynamics. Also prove that $\Delta E = q_v$	1 + 3 = 4
7.(a)	Write down Millikan's Oil Drop Method for the measurement of charge of an electron.	4
(b)	Benzoic acid, C_6H_5COOH, is a weak mono-basic acid ($K_a = 6.4 \times 10^{-5}\,mol\,dm^{-3}$). What is the pH of a solution containing 7.2g of sodium benzoate in one dm^3 of $0.02\,mol\,dm^{-3}$ benzoic acid?	4
8.(a)	State postulates of VSEPR Theory.	4
(b)	What is SHE? How it can be used to measure Electrode potential? (Construction 01 + diagram 01 + electrode potential measurement 02) = 4	4
9.(a)	Describe in detail the Elevation of Boiling Point.	4
(b)	Explain Chemical Method for the determination of rate of reaction.	4

Paper Code Number: 2488	2023 (1st-A) INTERMEDIATE PART-I (11th Class)		Roll No: _____
CHEMISTRY PAPER-I GROUP-II			
TIME ALLOWED: 20 Minutes	OBJECTIVE		MAXIMUM MARKS: 17

Q.No.1 You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.

S.#	QUESTIONS	A	B	C	D
1	Quantum number values for 2p orbitals are:	$n = 2, \ell = 0$	$n = 1, \ell = 2$	$n = 1, \ell = 0$	$n = 2, \ell = 1$
2	The number of bonds in nitrogen molecule is:	One σ and one π	One σ and two π	Three sigma only	Two σ and one π
3	The change in heat energy of a chemical reaction at constant temperature and pressure is called:	Enthalpy change	Heat of sublimation	Bond energy	Internal energy change
4	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 $\overline{NO}_3$ only	Ag^+, Ba^{2+} and $\overline{NO}_3$	Ba^{2+} and $\overline{NO}_3$ only	$Ba^{2+}, \overline{NO}_3$ and Cl
5	Molarity of pure water is:	1	18	55.5	6
6	The cathodic reaction in the electrolysis of dil. H_2SO_4 with Pt electrodes is:	Reduction	Oxidation	Both oxidation and reduction	Neither oxidation nor reduction
7	In zero order reaction, the rate is independent of:	Temperature of reaction	Concentration of reactants	Concentration of products	None of these
8	Number of molecules of CH_4 in 16g of CH_4:	12.04×10^{23}	3.01×10^{23}	6.02×10^{23}	1.5×10^{23}
9	The volume occupied by one mole of a gas at STP is:	$54\,dm^3$	$22.414\,dm^3$	$2.24\,dm^3$	$2.4\,dm^3$
10	The strongest acid among halogen acids is:	HI	HBr	HCl	HF
11	Enthalpy of combustion of C_2H_4 is:	$-1168\,kJ\,mol^{-1}$	$-1268\,kJ\,mol^{-1}$	$-1368\,kJ\,mol^{-1}$	$-1468\,kJ\,mol^{-1}$
12	Optimum pressure in Haber's process for synthesis of NH_3:	$100 - 150$ atm	$200 - 300$ atm	$350 - 450$ atm	$500 - 600$ atm
13	The reduction potential of Zn is:	$-0.76v$	$-0.34v$	$+0.34v$	$+0.76v$
14	The volume occupied by $1.4\,g$ of N_2 at S.T.P is:	$2.24\,dm^3$	$22.4\,dm^3$	$112\,dm^3$	$1.12\,dm^3$
15	Solvent extraction is an equilibrium process and is controlled by:	Law of mass action	Distribution law	The amount of solvent used	The amount of solute
16	Pressure remaining constant, at which temperature the volume of a gas will become twice of what it is at $0^o C$:	$546^o C$	$200^o C$	$546\,K$	$273\,K$
17	Acetone and chloroform are soluble in each other due to:	Intermolecular hydrogen bonding	Ion-dipole interaction	Instantaneous dipole	All of these

CHEMISTRY   PAPER-I   GROUP-II   Multan Board-2023

TIME ALLOWED: 2.40 Hours	SUBJECTIVE	MAXIMUM MARKS: 68

NOTE: Write same question number and its parts number on answer book, as given in the question paper.

SECTION-I

2.   Attempt any eight parts. $8 \times 2 = 16$

(i)   Define Stoichiometry. Write its assumptions.

(ii)   What do you know about Avogadro's number? Give one example.

(iii)   Calculate the mass in grams of 2.74 moles of $KMnO_4$. At mass of $Mn = 55$, At mass of $K = 39$.

(iv)   State Charles's Law. Write its mathematical form.

(v)   Write two application of Dalton's Law of Partial pressure.

(vi)   How you can determine the molecular mass of an unknown gas, if we know the pressure, temperature and volume along with the mass of that gas?

(vii)   Whichever gas is used in the discharge tube, the nature of the cathode rays remains the same. Why?

(viii)   Write names of different Quantum Numbers.

(ix)   Differentiate between Frequency and Wave number.

(x)   Define Enthalpy of formation. Give one example.

(xi)   Define Heat Capacity. Write its formula to calculate it.

(xii)   State First Law of Thermodynamics. Write its mathematical form.

3.   Attempt any eight parts. $8 \times 2 = 16$

(i)   Give difference between Qualitative analysis and Quantitative analysis.

(ii)   How rate of filtration can be increased by using fluted filter paper?

(iii)   Define Partition Chromatography. Give one example.

(iv)   What are Dipole-dipole forces of attraction? Give example.

(v)   Why ice floats over surface of liquid water?

(vi)   Define crystal lattice and unit cell.

(vii)   Why heat of hydrate of Li^+ is greater the that of Cs^+?

(viii)   Why ethylene glycol is added in radiator of automobile?

(ix)   What are Conjugated solutions? Give one example.

(x)   Define heterogeneous catalysis. Give an example.

(xi)   Differentiate between instantaneous rate of reaction and average rate of reaction.

(xii)   Discuss order of reaction with one example.

4.   Attempt any six parts. $6 \times 2 = 12$

(i)   Why is sigma bond stronger than pi-bond?

(ii) He_2 molecule is not formed. How do MOT justify it?

(iii)   Why do the ionization energies of elements decrease down the group of periodic table, although the nuclear charge increases?

(iv)   Why do we need buffer solutions?

(v)   What is the effect of rise in temperature on the solubility of KI in water?

(vi)   What is Lowry Bronsted idea of acids and bases?

(vii)   Write down the electrode reactions in alkaline battery.

(viii)   How can copper be purified electrolytically?

(ix)   What is emf of a cell?

SECTION-II

NOTE: Attempt any three questions. $3 \times 8 = 24$

5.(a)	Explain Isotopes. Also describe relative abundance of isotopes.	4
(b)	A sample of nitrogen gas is enclosed in a vessel of volume $380 \, cm^3$ at $120^\circ C$ and pressure of $101325 \, Nm^{-2}$. This gas is transferred to a $10 \, dm^3$ flask and cooled to $27^\circ C$. Calculate the pressure in Nm^{-2} entered by the gas at $27^\circ C$.	4
6.(a)	What is meant by vapour pressure of a liquid? How is it measured by manometric method?	4
(b)	Prove that $\Delta H = q_p$, complete mathematical form.	4
7.(a)	Explain Millikan's Oil Drop Method to calculate charge on electron.	4
(b)	The solubility of CaF_2 at $25^\circ C$ is found to be $2.05 \times 10^{-4} \, mol \, dm^{-3}$. What is the value of K_{sp} at this temperature?	4
8.(a)	Write the postulates of VSEPR theory. Also discuss the structure of NH_3 on the basis of VSEPR theory.	4
(b)	What is Electrochemical series? Also explain its any two applications.	4
9.(a)	Write down measurement of elevation of boiling point by Landsberger's method with diagram. 3+1=4	
(b)	Write down any four physical methods for the determination of rate of reaction.	4

Paper Code

Number: **2483**

2021 (A)

Roll No. _____

INTERMEDIATE PART-I (11ᵗʰ CLASS)

Multan Board-2021

CHEMISTRY   PAPER-I   GROUP-I

TIME ALLOWED: 20 Minutes

OBJECTIVE

MAXIMUM 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 bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) For which system does the equilibrium constant, K_C has units of (concentration)$^{-1}$?
(A) $N_2 + 3H_2 \rightleftharpoons 2NH_3$
(B) $H_2 + I_2 \rightleftharpoons 2HI$
(C) $2NO_2 \rightleftharpoons N_2O_4$
(D) $2HF \rightleftharpoons H_2 + F_2$

(2) 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

(3) If a strip of Cu metal is placed in a solution of $FeSO_4$:
(A) Cu will be deposited
(B) Fe is precipitated out
(C) Cu and Fe both dissolve
(D) No reaction takes place

(4) In zero order reaction, the rate is independent of:
(A) Temperature of reaction
(B) Concentration of reactants
(C) concentration of products
(D) None of these

(5) The comparative rates at which the solutes move in paper chromatography, depend upon:
(A) The size of paper
(B) R_f values of solutes
(C) Temperature of the experiment
(D) Size of the chromatographic tank used

(6) A pair of elements having single isotope are:
(A) $_9F^{19}$, $_{79}Au^{197}$
(B) $_{53}I^{127}$, $_{35}Br^{81}$
(C) $_8O^{16}$, $_7N^{14}$
(D) $_{33}As^{75}$, $_7N^{14}$

(7) 1 mole of CH_3OH and C_2H_5OH have:
(A) Equal number of molecules
(B) Equal number of atoms
(C) Equal number of ions
(D) Equal number of protons

(8) Dalton's law of partial pressure can be derived from:
(A) Avogadro's law
(B) General gas equation
(C) Charles's law
(D) All of these

(9) At absolute zero total Kinetic energy of gas molecules is:
(A) Maximum
(B) Zero
(C) Never becomes lower than 20 KJ
(D) Minimum

(10) Deby forces are also called:
(A) Dipole-dipole forces
(B) Dipole-Induced dipole forces
(C) London forces
(D) Ion-dipole forces

(11) Acetone and chloroform are soluble in each other due to:
(A) Intermolecular H – bonding
(B) Ion-dipole interaction
(C) Instantaneous dipole forces
(D) All of these

(12) The total number of Fundamental particles in an atom of Carbon – 14 is:
(A) 6
(B) 8
(C) 14
(D) 20

(13) Bohr model of an atom is contradicted by:
(A) Plank's quantum theory
(B) Dual nature of matter
(C) Heisenberg Uncertainity Principle
(D) All of these

(14) Among the following quantum a pair of molecule having similar geometry:
(A) BF_3, NH_3
(B) BF_3, AlF_3
(C) BeF_2, H_2O
(D) BCl_3, PCl_3

(15) Which one of following has the highest bond order?
(A) O_2^{+1}
(B) O_2^{+2}
(C) O_2^{-1}
(D) O_2^{-2}

(16) Energy of universe remains constant it is called:
(A) First law of thermodynamics
(B) First law of thermochemistry
(C) Second law of thermochemistry
(D) Second law of thermodynamics

(17) Which statement about the following equilibrium is correct?
$$2SO_{2(g)} + O_{2(g)} \rightleftharpoons 2SO_{3(g)} \qquad \Delta H = -188.3 \, KJ \, mol^{-1}$$
(A) The K_P value falls with a rise in temperature
(B) The K_P value falls with increasing pressure
(C) Adding V_2O_5 catalyst increase the equilibrium yield of SO_3
(D) The K_P value is equal to K_C

NOTE: - Write same question number and its part number on answer book, as given in the question paper.

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SECTION-I

2.   **Attempt any eight parts.** $8 \times 2 = 16$
(i)   Write assumptions of stoichiometry.
(ii)   Why does actual yield is always less than theoretical yield?
(iii)   Define Avogadro's number and give one example.
(iv)   Define R_f value (retardation factor).
(v)   What are different types of chromatography?
(vi)   Derive numerical value of gas constant R in S.I units.
(vii)   Derive an expression for calculating density of a gas from general gas equation.
(viii) Explain Avogadro's law by giving one example.
(ix)   State Dalton's Law of Partial Pressure.
(x)   What are different types of solubility curves?
(xi)   Write names of different types of colligative properties of solutions.
(xii)   Explain hydration energy of ions briefly.

3.   **Attempt any eight parts.** $8 \times 2 = 16$
(i)   What are Debye forces?
(ii)   Why HF has lower boiling point than H_2O?
(iii)   What are crystalline solids?
(iv)   What is a unit cell?
(v)   What is atomic absorption spectrum?
(vi)   What is Stark effect?
(vii)   What is uncertainity principle?
(viii) Calculate wavelength of electron moving with velocity $2.188 \times 10^6 \, ms^{-1}$.
(ix)   What are conditions to maximize yield of NH_3?
(x)   How K_C is used to find the direction of reaction?
(xi)   What is reaction intermediate, give example?
(xii)   Define order of reaction, with example.

4.   **Attempt any six parts.** $6 \times 2 = 12$
(i)   Explain with reason that π bonds are more diffused than σ bonds.
(ii)   Ionization energy decreases down the group and increases along the period, give reason.
(iii)   Write two postulates of VSEPR theory.
(iv)   Prove $\Delta E = qv$
(v)   Prove $qp = \Delta H$
(vi)   Define covalent bond. Give one example.
(vii)   Calculate the oxidation number of Mn in $KMnO_4$.
(viii) What is function of salt bridge in Galvanic cell?
(ix)   What is difference between oxidation and reduction process, give one example of each?

SECTION-II

NOTE: Attempt any three questions. $3 \times 8 = 24$

5.(a)   10g of H_3PO_4 has been dissolved in excess of water to dissociate it completely into ions.
        Calculate   (i) masses of individual ions
                     (ii) number of positive and negative charges dispersed in solution   4
(b)   Give uses of liquid crystals.   4

6.(a)   What is Boyle's law of gases?   Give its experimental verification.   4
(b)   What is spectrum? Differentiate between continuous spectrum and line spectrum.   4

7.(a)   Explain atomic orbital hybridization with reference to structures for C_2H_4 and C_2H_2.   4
(b)   Define the following enthalpies and give one example for each.
        (i) standard enthalpy of atomization   (ii) standard enthalpy of formation   4

8.(a)   Define the following terms: 4
        (i) Instantaneous rate   (ii) Specific rate constant   (iii) order of reaction   (iv) Activated complex
(b) $N_{2(g)}$ and $H_{2(g)}$ combine to give $NH_{3(g)}$. The value of K_C in this reaction at 500^oC is 6.0×10^{-2}.
        Calculate the value of K_P for this reaction.   4

9.(a)   What do you mean by depression of freezing point and describe Beckmann's method
        for measurement of depression of freezing point.   4

Paper Code	2021 (A)	Roll No._____
Number: 2484	INTERMEDIATE PART-I (11th CLASS)	

CHEMISTRY   PAPER-I   GROUP-II   TIME ALLOWED: 20 Minutes
OBJECTIVE   MAXIMUM 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 bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) Total number of electrons in f orbital is:
(A) 14   (B) 10   (C) 6   (D) 2

(2) Bohr model of atom is contradicted by:
(A) Plank's quantum theory   (B) Dual nature of matter
(C) Heisenberg's uncertainty principle   (D) All of these

(3) The bond order of He_2 is:
(A) Two   (B) Three   (C) Zero   (D) One

(4) How many types of bonds in NH_4Cl are:
(A) One type   (B) Two types   (C) Three types   (D) Four types

(5) $\sum \Delta H$ (cycles) = 0 The above law is known as:
(A) Henry's law   (B) Hess's law   (C) Kohlarus law   (D) Darwins law

(6) $2O_3 \rightleftharpoons 3O_2$ K_C at $25°C$ is:
(A) 10^{55} (B) 10^{-13} (C) 2.5   (D) 10^4

(7) Among the following which equation has no unit of K_C:
(A) $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$ (B) $PCl_5 \rightleftharpoons PCl_3 + Cl_2$

(C) $CH_3 - \overset{O}{\overset{\|}{C}} - OC_2H_5 + H_2O \underset{H^+}{\rightleftharpoons} CH_3 - \overset{O}{\overset{\|}{C}} - OH + C_2H_5OH$

(D) $N_2O_4 \rightleftharpoons 2NO_2$

(8) The correct equation of Raoult's law:
(A) $\frac{\Delta p}{p^o} = X_2$ (B) $\frac{\Delta p}{p^o} = X_1$ (C) $\frac{p^o}{\Delta p} = X_2$ (D) $\frac{p^o}{\Delta p} = x_2 - x_1$

(9) The standard redox potential of following reaction is $Zn^{2+} + 2e^- \longrightarrow Zn$
(A) -0.76 V   (B) 2.87 V   (C) -0.026 V   (D) -3.045 Volt

(10) The order of following reaction is $CHCl_{3(\ell)} + Cl_{2(g)} \longrightarrow CCl_{4(\ell)} + HCl_{(g)}$
(A) 1st (B) 1.5   (C) 2.5   (D) Zero

(11) In 98g of sulphuric acid H_2SO_4 number of O atoms:
(A) 6.02×10^{23} (B) 2.408×10^{24} (C) 1.2×10^{24} (D) 6.02×10^{24}

(12) S_n (Tin) has number of isotopes:
(A) 10   (B) 11   (C) 5   (D) 6

(13) The solvent extraction technique is particularly useful when the product is:
(A) Volatile and thermally unstable   (B) Volatile and thermally stable
(C) Non volatile and thermally stable   (D) Non volatile and thermally unstable

(14) Kinetic equation $PV = \frac{1}{3}mN\overline{c^2}$ is derived by:
(A) Maxwell   (B) Boltzmann   (C) Clausius   (D) Bernulli

(15) The sun is a _____ ball of plasma heated by nuclear fusion process.
(A) 1.5 million kilometer   (B) 1.5 billion kilometer   (C) 3 million kilometer   (D) None of these

(16) The order of acidic strength:
(A) $HF > HCl > HBr > HI$ (B) $HCl > HF > HI > HBr$
(C) $HI > HBr > HCl > HF$ (D) $HBr > HF > HI > HCl$

(17) London dispersion forces are the only forces present among:
(A) The molecules of H_2O in liquid state at high temperature
(B) The atoms of Helium in gaseous state at high temperature

NOTE: - Write same question number and its part number on answer book, as given in the question paper.

SECTION-I

2.   **Attempt any eight parts.** $8 \times 2 = 16$

(i)   Why actual yield is always less than theoretical yield?

(ii)   Define limiting reactant with an example.

(iii)   Define Stoichiometry.

(iv)   Give examples of subliming solids.

(v)   What are three ways used for paper chromatography?

(vi)   State Boyle's law with its equation.

(vii)   State Charles's law with its equation.

(viii)   Briefly derive general gas equation.

(ix)   Derive value of 'R' in S.I units.

(x)   Define heat of solution with one example.

(xi)   Justify all solutions containing 1 mole of non-volatile, non-electrolyte solutes in same solvent will have the same freezing point depression.

(xii)   What is Raoult's Law?

3.   **Attempt any eight parts.** $8 \times 2 = 16$

(i)   Explain Dipole-Dipole forces in chloroform ($CHCl_3$).

(ii)   Describe solubility of Hydrogen bonded molecules.

(iii)   Define polymorphism. Write one example.

(iv)   Describe triclinic system. Give its dimensions.

(v)   Why positive rays are called canal rays?

(vi)   Differentiate between frequency and wave length.

(vii)   Describe atomic emission spectrum.

(viii)   State Heisenberg's uncertainty principle. Write its mathematical form.

(ix)   Define acid and base according to Lowry Bronsted.

(x)   Define Buffer solutions. Write its two characteristics.

(xi)   Define rate of reaction. Write its unit.

(xii)   What is Pseudo first order reaction? Give one example.

4.   **Attempt any six parts.** $6 \times 2 = 12$

(i)   Define polar covalent bond. Give two examples.

(ii)   Differentiate between covalent bond and co-ordinate covalent bond.

(iii)   Discuss AB_2 type molecules in the light of VSEPR theory. Give two examples.

(iv)   Define atomic orbital hybridization. Name its two types.

(v)   Differentiate between system and surroundings.

(vi)   State first law of thermodynamics. Also define enthalpy of a system.

(vii)   What is Standard Hydrogen Electrode(SHE)? Explain with the help of diagram.

(viii)   Define electrochemical series.

(ix)   Calculate the oxidation number of chromium in the following compounds.

    (a) $K_2Cr_2O_7$ (b) K_2CrO_4

SECTION-II

NOTE: Attempt any three questions. $3 \times 8 = 24$

5.(a)   What are liquid crystals? Give their uses in daily life.   4

(b)   Magnesium metal reacts with HCl to give hydrogen gas. What is minimum volume of HCl solution (27% by weight) required to produce 12.1g of H_2. The density of HCl solution is 1.14g/cm^3

$$Mg_{(s)} + 2HCl_{(aq)} \longrightarrow MgCl_{2(aq)} + H_{2(g)}$$ 4

6.(a)   Derive Boyle's and Charles's law with the help of kinetic theory of gases.   4

(b)   Explain Rutherford's atomic model. Give its defects.   4

7.(a)   Define sp^3 hybridization. Draw the structure of ammonia molecule according to hybridization concept.   4

(b)   Explain the following terms: 4

    (i) Standard heat of Neutralization   (ii) Standard Enthalpy of solution

8.(a)   Whats the percentage Ionization of acetic acid in a solution in which 0.1 mole of it has been dissolved per dm^3 of solution while Ka of acetic acid is 1.85×10^{-5}.   4

(b)   Explain the Rate determining step with suitable example.   4

Multan Board-2019

Paper Code Number: **2481**

2019 (A)

Roll No._____

INTERMEDIATE PART-I (11ᵗʰ CLASS)

CHEMISTRY PAPER-I (NEW SCHEME) GROUP-I   MAXIMUM MARKS: 17

TIME ALLOWED: 20 Minutes   **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 bubble in front of that question number. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve questions on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) The largest number of molecules are present in:
(A) 3.6g of H_2O (B) 4.8g of C_2H_5OH (C) 12.8g of CO (D) 5.4g of N_2O_5

(2) One mole of SO_2 contains: (A) 6.02×10^{23} atoms of Oxygen
(B) 18.1×10^{23} molecules of SO_2 (C) 6.02×10^{23} atoms of S (D) 4 gram atoms of SO_2

(3) The comparative rates at which the solutes move in paper chromatography depend on:
(A) The size of paper   (B) R_f values of solutes
(C) Temperature of the experiment   (D) Size of the chromatographic tank used

(4) The deviation of a gas from ideal behaviour is maximum at:
(A) $-10^\circ C$ and 5.0 atm   (B) $-10^\circ C$ and 2.0 atm   (C) $100^\circ C$ and 2.0 atm   (D) $0^\circ C$ and 2.0 atm

(5) The order of rate of diffusion of gases NH_3, SO_2, Cl_2 and CO_2 is:
(A) $NH_3 > SO_2 > Cl_2 > CO_2$ (B) $NH_3 > CO_2 > SO_2 > Cl_2$
(C) $Cl_2 > SO_2 > CO_2 > NH_3$ (D) $NH_3 > CO_2 > Cl_2 > SO_2$

(6) Amorphous solids:
(A) Have sharp melting points   (B) Undergo clean cleavage when cut with knife
(C) Have perfect arrangement of atoms   (D) Can possess small regions of orderly arrangement

(7) Diamond is a bad conductor because: (A) It has a tight structure   (B) It has a high density
(C) There are no free electrons present in the crystal of diamond to conduct electricity
(D) Is transparent to light

(8) In the ground state of an atom, the electron is present:
(A) In the nucleus   (B) In the second shell   (C) Nearest to the nucleus   (D) Farthest from the nucleus

(9) Quantum number values for 2P orbitals are:
(A) $n = 2$ $\ell = 1$ (B) $n = 1$ $\ell = 2$ (C) $n = 1$ $\ell = 0$ (D) $n = 2$ $\ell = 0$

(10) The number of bonds in Nitrogen molecule is:
(A) One σ and one π (B) One σ and two π (C) Three sigma only   (D) Two σ and one π

(11) Which of the Hydrogen halides has the highest percentage of ionic character?
(A) HCl (B) HBr (C) HF (D) HI

(12) The change in heat energy of a chemical reaction, at constant temperature and pressure is called:
(A) Enthalpy change   (B) Heat of combustion   (C) Bond energy   (D) Internal energy change

(13) The solubility product of $AgCl$ is 2.0×10^{-10} $mol^2 dm^{-6}$. The maximum concentration of Ag^+ ions in the solution is: (A) 2.0×10^{-10} $mol\, dm^{-3}$
(B) 1.41×10^{-5} $mol\, dm^{-3}$ (C) 1.0×10^{-10} $mol\, dm^{-3}$ (D) 4.0×10^{-20} $mol\, dm^{-3}$

(14) Which of the following solutions has the highest boiling point?
(A) 5.85 % solution of Sodium Chloride   (B) 18.0% solution of Glucose
(C) 6.0 % solution of Urea   (D) All have the same boiling point

(15) 18g of Glucose is dissolved in 90g of water. The relative lowering of vapour pressure is equal to:
(A) $\frac{1}{5}$ (B) 5.1   (C) $\frac{1}{51}$ (D) 6

(16) If the salt bridge is not used between the two half cells, then the voltage:
(A) Decreases rapidly   (B) Decreases slowly   (C) Does not change   (D) Drops to zero

(17) If the rate equation of a reaction $2A + B \rightarrow$ products is, rate = $K[A]^2[B]$ and A is present in large excess, then the order of reaction is: (A) 1   (B) 2   (C) 3   (D) None of these

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NOTE: - Write same question number and its part number on answer book,
as given in the question paper.

SECTION-I

8 × 2 = 16

2.   **Attempt any eight parts.**
   (i)   Why do the isotopes have same chemical but different physical properties?
   (ii)   Define gram formula. Give two examples.
   (iii)   What is Stoichiometry? Give its two assumptions.
   (iv)   Why is there a need to crystallize the crude product?
   (v)   What do you mean by solvent extraction? Which law does control it?
   (vi)   How is absolute zero explained by drawing graph?
   (vii)   Calculate the value of gas constant "R" in S.I units.
   (viii)   Derive Avogadro's Law from Kinetic molecular theory of gases.
   (ix)   Lighter gases diffuse more rapidly than heavier gases. Give reasons.
   (x)   One molal solution of urea is more dilute than one molar solution. Why?
   (xi)   Define Raoult's Law. Give one of its mathematical expression
   (xii)   What is discontinuous solubility curve? Give one example.

8 × 2 = 16

3.   **Attempt any eight parts.**
   (i)   Why do fish and plants in ponds survive under blanket of ice during cold winters?
   (ii)   Define Polymorphism. Give one example.
   (iii)   Freshly cut metals show the property of metallic luster. Comment on the statement.
   (iv)   Write down any two properties of Molecular Solids.
   (v)   Calculate the mass of electron from its e/m value.
   (vi)   Justify the statement that angular momentum of an electron revolving in orbit is quantized.
   (vii)   How was dual nature of electron verified by Davisson and Germer?
   (viii)   State Aufbau principle. Write electronic configuration of Sodium ($_{11}Na$) following this principle.
   (ix)   Define the given terms: (a) common ion effect (b) solubility product
   (x)   What is the difference between heat and temperature?
   (xi)   Define pseudo first order reaction. Given one example.
   (xii)   Write down two examples to explain the activation of catalyst.

6 × 2 = 12

4.   **Attempt any six parts.**
   (i)   Differentiate between exothermic and endothermic reactions.
   (ii)   Define Ionization energy. How does it vary in periodic table?
   (iii)   Ionic radii of anions are greater than their parent atoms. Why?
   (iv) CO_2 is non-polar whereas H_2O is polar molecule. Give reason.
   (v)   Define Dipole Moment. Give its various units.
   (vi)   State 1ˢᵗ law of thermodynamics.
   (vii)   Define oxidation number. Calculate oxidation number of 'Mn' in $KMnO_4$.
   (viii)   Differentiate between a primary cell and a secondary cell.
   (ix)   Write electrochemical reactions taking place in Alkaline battery.

SECTION-II

3 × 8 = 24

NOTE: - **Attempt any three questions.**

5.(a)   Describe combustion analysis to determine mass percentages of C, H and O in
an organic compound.   4

   (b)   What is meant by Hydrogen Bonding? How it explains the helix structure of proteins?   4

6.(a)   Write defects in Bohr's model of an atom.   4

   (b)   One mole of methane gas is maintain at 300K its volume is $250 Cm^3$.
Calculate the pressure exerted by the gas.   4

7.(a)   What is Electron Affinity? How does it show variation along groups and
periods in the periodic table?   4

   (b)   Describe the Hess's Law of Constant Heat Summation and give one example to explain it.   4

8.(a) $N_{2(g)}$ and $H_{2(g)}$ combine to give $NH_{3(g)}$. 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

   (b)   How does Arrhenius equation help us to calculate the energy of activation of a reaction?   4

9.(a)   Write Landsberger's method for determination of elevation of boiling point.   4

   (b)   Define voltaic of Galvanic cell. Write its function with chemical equations.   4

Paper Code Number: **2482**

INTERMEDIATE PART-I (11ᵗʰ CLASS)

CHEMISTRY PAPER-I (NEW SCHEME)   GROUP-II   MAXIMUM MARKS: 17
TIME ALLOWED: 20 Minutes   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 bubble in front of that question number. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve questions on this sheet of OBJECTIVE PAPER.

Q.No.1

(1)   27g of Al will reacts completely with how much mass of O_2 to produce Al_2O_3?
(A) 8 g of Oxygen   (B) 16 g of Oxygen   (C) 32 g of Oxygen   (D) 24 g of Oxygen

(2)   The number of moles of CO_2 which contain 8.0g of Oxygen:
(A) 0.25   (B) 0.50   (C) 1.0   (D) 1.50

(3)   Solvent extraction is an equilibrium process and is controlled by:
(A) Law of mass action
(B) Distribution Law   (C) Amount of the solvent used   (D) The amount of the solute

(4)   A real gas obeying Van der Waal's Equation will resemble ideal gas if:
(A) Both 'a' and 'b' are large   (B) Both 'a' and 'b' are small
(C) 'a' is small and 'b' is large   (D)) 'a' is large and 'b' is small

(5)   The molar volume of CO_2 is maximum at:
(A) STP   (B) $127°C$ and 1atm   (C) $0°C$ and 2atm   (D) $273°C$ and 1atm

(6)   Acetone and chloroform are soluble in each other due to: (A) Intermolecular hydrogen bonding
(B) Ion-dipole interaction   (C) Instantaneous dipole   (D) All these

(7)   London dispersion forces are the only forces present among the:
(A) Molecules of Water in liquid state   (B) Atoms of Helium in gaseous state at high temperature
(C) Molecules of solid Iodine   (D) Molecules of Hydrogen Chloride gas

(8)   The nature of positive rays depend on:
(A) The nature of the electrode   (B) The nature of the discharge tube
(C) The nature of the residual gas   (D) All these

(9)   When 6d orbital is complete, the entering electron goes into: (A) 7f   (B) 7s   (C) 7p   (D) 7d

(10)   Which of the following molecules has zero dipole moment?
(A) NH_3 (B) $CHCl_3$ (C) H_2O (D) BF_3

(11)   The Bond order of N_2 molecule is: (A) 0   (B) 1   (C) 2   (D) 3

(12)   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) $q_p = \frac{q_v}{2}$

(13)   An excess of aqueous Silver nitrate is added to the 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^{++} and NO_3^-
(C) Ba^{++} and NO_3^- (D) Ba^{++} and NO_3^- and Cl^-

(14)   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

(15)   Which of the following solutions has the highest boiling point?
(A) 5.85 % solution of Sodium Chloride   (B) 18.0 % solution of Glucose
(C) 6.0 % solution of Urea   (D) all have the same boiling point

(16)   The unit of the rate constant is the same as that of the rate of reaction in:
(A) First order reaction   (B) Second order reaction   (C) Zero order reaction   (D) Third order reaction

(17)   Which of the following statements is not correct about Galvanic cell?
(A) Anode is negatively charged   (B) Reduction occurs at anode
(C) Cathode is positively charged   (D) Reduction occurs at Cathode

Multan Board-2019
2019 (A)
Roll No: _____
INTERMEDIATE PART-I (11th CLASS)
CHEMISTRY PAPER-I (NEW SCHEME) GROUP-I
TIME ALLOWED: 2.40 Hours **SUBJECTIVE** MAXIMUM MARKS: 68

NOTE: - Write same question number and its part number on answer book, as given in the question paper.

SECTION-I

$8 \times 2 = 16$

2.

Attempt any eight parts.

(i) Why do the isotopes have same chemical but different physical properties?

(ii) Define gram formula. Give two examples.

(iii) What is Stoichiometry? Give its two assumptions.

(iv) Why is there a need to crystallize the crude product?

(v) What do you mean by solvent extraction? Which law does control it?

(vi) How is absolute zero explained by drawing graph?

(vii) Calculate the value of gas constant "R" in S.1 units.

(viii) Derive Avogadro's Law from Kinetic molecular theory of gases.

(ix) Lighter gases diffuse more rapidly than heavier gases. Give reasons.

(x) One molal solution of urea is more dilute than one molar solution. Why?

(xi) Define Raoult's Law. Give one of its mathematical expression

(xii) What is discontinuous solubility curve? Give one example.

$8 \times 2 = 16$

3.

Attempt any eight parts.

(i) Why do fish and plants in ponds survive under blanket of ice during cold winters?

(ii) Define Polymorphism. Give one example.

(iii) Freshly cut metals show the property of metallic luster. Comment on the statement.

(iv) Write down any two properties of Molecular Solids.

(v) Calculate the mass of electron from its e/m value.

(vi) Justify the statement that angular momentum of an electron revolving in orbit is quantized.

(vii) How was dual nature of electron verified by Davisson and Germer?

(viii) State Aufbau principle. Write electronic configuration of Sodium ($_{11}Na$) following this principle.

(ix) Define the given terms: (a) common ion effect (b) solubility product

(x) What is the difference between heat and temperature?

(xi) Define pseudo first order reaction. Given one example.

(xii) Write down two examples to explain the activation of catalyst.

$6 \times 2 = 12$

4.

Attempt any six parts.

(i) Differentiate between exothermic and endothermic reactions.

(ii) Define Ionization energy. How does it vary in periodic table?

(iii) Ionic radii of anions are greater than their parent atoms. Why?

(iv) CO_2 is non-polar whereas H_2O is polar molecule. Give reason.

(v) Define Dipole Moment. Give its various units.

(vi) State 1st law of thermodynamics.

(vii) Define oxidation number. Calculate oxidation number of 'Mn' in $KMnO_4$.

(viii) Differentiate between a primary cell and a secondary cell.

(ix) Write electrochemical reactions taking place in Alkaline battery.

SECTION-II

$3 \times 8 = 24$

NOTE: - Attempt any three questions.

5.(a) Describe combustion analysis to determine mass percentages of C, H and O in an organic compound. 4

(b) What is meant by Hydrogen Bonding? How it explains the helix structure of proteins? 4

6.(a) Write defects in Bohr's model of an atom. 4

(b) One mole of methane gas is maintain at 300K its volume is $250 Cm^3$. Calculate the pressure exerted by the gas. 4

7.(a) What is Electron Affinity? How does it show variation along groups and periods in the periodic table? 4

(b) Describe the Hess's Law of Constant Heat Summation and give one example to explain it. 4

8.(a) $N_{2(g)}$ and $H_{2(g)}$ combine to give $NH_{3(g)}$. 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

(b) How does Arrhenius equation help us to calculate the energy of activation of a reaction? 4

9.(a) Write Landsberger's method for determination of elevation of boiling point. 4

(b) Define voltaic of Galvanic cell. Write its function with chemical equations. 4

CHEMISTRY PAPER-I (NEW SCHEME)   GROUP-I

TIME ALLOWED: 20 Minutes   **OBJECTIVE**   MAXIMUM 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 bubble in front of that question number. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve questions on this sheet of OBJECTIVE PAPER.

Q.No.1

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(1) The size of an atom is in the range of:-

(A) $2 \times 10^{-9}m$ (B) $2 \times 10^{-10}m$ (C) $2 \times 10^{-11}m$ (D) $2 \times 10^{-12}m$

(2) _____ is used as antifreeze in radiator of automobile.

(A) Aspartame   (B) Ethylene glycol   (C) Serotenin   (D) Hydrazine

(3) On cooling a hot saturated solution makes the solution:-

(A) Dilute   (B) Super saturated   (C) Opaque   (D) Unsaturated

(4) _____ gas has lowest rate of diffusion.

(A) He (B) H_2 (C) O_2 (D) N_2

(5) The strongest acid among Halogen acids is:-

(A) HCl (B) HBr (C) HI (D) HF

(6) Dipole-induced dipole forces are also called:-

(A) Dipole-dipole forces   (B) Ion-dipole forces   (C) Debye forces   (D) London dispersion forces

(7) $1\overset{\circ}{A} = $ _____ m (A) 10^{-10} (B) 10^{-11} (C) 10^{-12} (D) 10^{-13}

(8) The maximum number of unpaired electrons are present in:-

(A) $Fe = 26$ (B) $Ni = 28$ (C) $Cr = 24$ (D) $Na = 11$

(9) _____ element has highest value of electron affinity.

(A) Fluorine   (B) Chlorine   (C) Bromine   (D) Iodine

(10) In ethyne molecule the number and nature of bonds are:-

(A) One sigma two pi (B) Two sigma one pi (C) Three sigma two pi (D) Two sigma two pi

(11) 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) $q_p = \dfrac{q_v}{2}$

(12) _____ affects the value of K_c.

(A) Concentration   (B) Temperature   (C) Catalyst   (D) Pressure

(13) When ionic product of a solution is greater than the solubility product at a particular temperature then the solution is said to be:-   (A) Unsaturated   (B) Saturated   (C) Very dilute   (D) Super saturated

(14) 18 g of glucose is dissolved in 90 g of water. The relative lowering of vapour pressure is equal to:-

(A) $\dfrac{1}{51}$ (B) $\dfrac{1}{5}$ (C) 5.1   (D) 6

(15) The number of water molecules in $CuSO_4.5H_2O$ attacked with Cu^{2+} ion:-

(A) One   (B) Two   (C) Three   (D) Four

(16) Anode and cathode in alkaline cell is made up of _____ respectively.

(A) MnO_2 and Zn (B) Pb and PbO_2 (C) Zn and Ag_2O (D) Zn and MnO_2

(17) Half life of a second order reaction is inversely proportional to:-

(A) Initial concentration of reactants   (B) Final concentration of reactants

(C) Initial concentration of products   (D) Final concentration of products

CHEMISTRY   PAPER-I   (NEW SCHEME)   GROUP-I

TIME ALLOWED: 2.40 Hours   **SUBJECTIVE**   MAXIMUM MARKS: 68

NOTE: - Write same question number and its part number on answer book, as given in the question paper.

SECTION-I

2.   **Attempt any eight parts.**   pakcity.org $8 \times 2 = 16$

(i)   Define Relative Atomic Mass and Atomic Mass Unit.

(ii) N_2 and CO have the same number of electrons, protons and neutrons. Justify it.

(iii)   Actual Yield is usually less than Theoretical Yield. Why?

(iv)   Write any four characteristics of a good solvent for crystallization.

(v)   Define Solvent Extraction and Partition Law.

(vi)   Derive Avogadro's Law from Kinetic Molecular theory of gases.

(vii)   Define Joule-Thomson effect and Critical temperature of a gas.

(viii)   Give the units of Van der Waal's Constant 'a' and 'b'.

(ix)   Define Law of Mass Action and Equilibrium Constant (K_C)

(x)   Why do we need buffers in daily life?

(xi)   What is Lowry-Bronsted concept of acids and bases?

(xii)   Define Solubility Product Constant (K_{SP})

3.   **Attempt any eight parts.** $8 \times 2 = 16$

(i)   State Electron Pool Theory.

(ii)   What is Transition Temperature? Give an example.

(iii)   Give two uses of Liquid Crystals.

(iv)   Give reason that Earthenware Vessels keep water cool.

(v)   How nature of bond can be determined by electronegative values?

(vi)   Why Ionic radius is greater than Atomic radius?

(vii)   Write two points of Valence Bond theory.

(viii)   Draw molecular orbital picture of Nitrogen molecule.

(ix)   Define System and Surrounding.

(x)   What is Standard enthalpy of Neutralization? Give an example.

(xi)   What is meant by Water of Crystallization? Give two examples.

(xii)   Aqueous solution of $CuSO_4$ is acidic in nature. Explain.

4.   **Attempt any six parts.** $6 \times 2 = 12$

(i)   Why is the $\frac{e}{m}$ value for the positive rays always smaller that that of cathode rays?

(ii)   The potential energy of an electron in an atom is negative. Give reason.

(iii)   What is fine structure of Hydrogen spectrum?

(iv)   State Heisenberg's uncertainty principle. Give its mathematical formula.

(v)   What is Anodized Aluminium? Give its advantages.

(vi)   Write reactions taking place at anode and cathode in silver oxide battery.

(vii)   What is the difference between Ionization and Electrolysis?

(viii)   What are reaction intermediates? Give one example.

(ix)   Name four physical methods for the determination of rate of a chemical reaction.

SECTION-II

NOTE: - Attempt any three questions. $3 \times 8 = 24$

5.(a)   Define boiling point and how does it is effected by external pressure? Explain briefly.   4

(b)   A mixture of two liquids, hydrazine (N_2H_4) and N_2O_4 are used in rockets. They produce N_2 and water vapours. How many grams of N_2 gas will be formed by reacting 100 g of N_2H_4 and 200 g of N_2O_4 $2N_2H_4 + N_2O_4 \rightarrow 3N_2 + 4H_2O$ 4

6.(a)   Define critical temperature of gases. What is its importance in liquefaction of gases? Discuss Linde's method of liquefaction of gases.   4

(b)   What are x-rays? What is their origin? How was the idea of atomic number derived from discovery of x-Rays and Moseley's Law.   4

7.(a)   Define atomic orbital Hybridization. Explain Sp^2-Hybridization with the help of BF_3 molecule.   4

(b)   How enthalpy of reaction can be measured by Bomb-Calorimeter?   4

8.(a)   Explain Lowry Bronsted Acid and Base concept. Explain giving examples.   4

(b)   Write any four applications of electrochemical series.   4

9.(a)   The boiling point of a solution containing 0.2 g of a substance 'A' in 20.0g of ether(molar mass = 74) is 0.17 K higher than that of pure ether. Calculate the molar mass of 'A'. Molal boiling point constant of ether is 2.16 k.   4

(b)   Define Catalysis. Differentiate between Homogeneous catalysis and Heterogenous catalysis

CHEMISTRY   PAPER-I   (NEW SCHEME)   **GROUP-II**

TIME ALLOWED: 20 Minutes   **OBJECTIVE**   MAXIMUM 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 bubble in front of that question number. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled.   Do not solve questions on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) If 5.85 g of $NaCl$ (Mol. mass 58.5) is dissolved in 90 g of H_2O, the mole fraction of $NaCl$ will be:-

(A) 0.01   (B) 0.1   (C) 0.0196   (D) 0.3

(2) The molal boiling point constant is the ratio of the elevation of boiling point to:-

(A) Molarity   (B) Molality   (C) Mole fraction of solvent   (D) Mole fraction of solute

(3) Fuel cell convert chemical energy into:-

(A) Electrical energy   (B) Light energy   (C) Heat energy   (D) Mechanical energy

(4) The Enzyme used for Hydrolysis of urea is:-

(A) Invertase   (B) Urease   (C) Lipase   (D) Zymase

(5) Atom of _____ element has independent existence.

(A) Fluorine   (B) Krypton   (C) Oxygen   (D) Nitrogen

(6) In combustion analysis, H_2O vapours are absorbed by:-

(A) 50 % KOH (B) Al_2O_3 (C) $Mg(ClO_4)_2$ (D) SiO_2

(7) In _____ technique a solute distribute between two immiscible liquids.

(A) Crystallization   (B) Solvent extraction   (C) Filtration   (D) Distillation

(8) The S.I unit of pressure is expressed in:-

(A) Nm^{-1} (B) Nm^{-2} (C) Nm^{-3} (D) $mmHg$

(9) _____ is molecular solid.

(A) $NaCl$ (B) CO_2 dry ice form   (C) Diamond   (D) Aluminium nitride

(10) Transition temperature of KNO_3 is:-

(A) $13.2°C$ (B) $95.5°C$ (C) $128°C$ (D) $32.02°C$

(11) Orbitals having same energy are called:-

(A) Hybrid orbitals (B) Valence orbitals   (C) Degenerate orbitals   (D) d-orbitals

(12) 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

(13) _____ has net dipole moment.

(A) CCl_4 (B) BF_3 (C) $\ddot{N}H_3$ (D) CO_2

(14) _____ is not paramagnetic.

(A) O_2^{-2} (B) O_2 (C) N_2^{-2} (D) None of these

(15) _____ is not state function.

(A) Pressure   (B) Volume   (C) Temperature   (D) Heat

(16) The sum of P^H and P^{OH} at 25°C always equal to:-

(A) 7   (B) Zero   (C) 14   (D) 10^{-14}

(17) The units for kw of H_2O are:-

(A) $mole/dm^3$ (B) $mol^2 dm^{-6}$ (C) $mol^{-2} dm^6$ (D) $mol^{-2} dm^{-3}$

NOTE: - Write same question number and its part number on answer book, as given in the question paper.

SECTION-I

2. Attempt any eight parts.　　　　　　　　　　　　8 × 2 = 16
- (i) Mg – atom is twice heavier than that of C – atom why?
- (ii) Define Atomicity. Give two examples.
- (iii) Calculate the mass in grams of 2.74 moles of $KMnO_4$.
- (iv) How are crystals dried using filter paper? Give its two disadvantages.
- (v) Write any four properties of a good solvent.
- (vi) Derive Avogadro's law from Kinetic equation(KM.T).
- (vii) Gases deviate from ideal behaviour more significantly at high pressure and low temperature. Give reason.
- (viii) Water vapours do not behave ideally at 273 k. Justify.
- (ix) Differentiate between reversible and irreversible reactions.
- (x) How do the buffer solutions act?
- (xi) Calculate the pH of $10^{-4}\ mol\ dm^{-3}$ of HCl.
- (xii) Explain that a mixture of NH_4OH and NH_4Cl gives us the basic buffer.

3. Attempt any eight parts.　　　　　　　　　　　　8 × 2 = 16
- (i) What is meant by Hydration?
- (ii) Define critical solution temperature or upper consulate temperature.
- (iii) State Octet Rule. Give one example.
- (iv) Isomerism is not possible in ionic compounds. Why?
- (v) How bond length is effected by change of hybridization state?
- (vi) Calculate bond order of N_2 molecule.
- (vii) What are Exothermic Reactions? Give example.
- (viii) Define State Function.
- (ix) Diamond is hard. Why?
- (x) Why metals are good conductor of electricity?
- (xi) What are "dipole – induced dipole forces"?
- (xii) Ice has less density than liquid water. Why?

4. Attempt any six parts.　　　　　　　　　　　　6 × 2 = 12
- (i) Give two defects in Bohr's atomic model.
- (ii) Whatever gas is used in the discharge tube. The nature of the cathode rays remains the same. Why?
- (iii) The positive rays are also called canal rays. Why?
- (iv) Define Heisenberg's Uncertainty Principle and give its mathematical expression.
- (v) Define Oxidation and Oxidation Number.
- (vi) Lead accumulator is a rechargeable battery. Prove.
- (vii) 'Na' and 'K' can displace Hydrogen from acids but 'Pt', 'Pd' and 'Cu' can not, why?
- (viii) Radioactive decay is always a first order reaction. Justify it.
- (ix) What is Negative Catalysis? Give one example.

SECTION-II

NOTE: - Attempt any three questions.　　　　　　　　3 × 8 = 24

5.(a) A well known metal M reacts with S to form a compound M_2S_3. If 3.12 g of M (metal) reacts with exactly 2.88 g of S (Sulphur), what are the names of metal M and the compound M_2S_3.　　　　　　4

(b) Define ionic solids. Give three properties of ionic solids.　　　4

6.(a) Derive General Gas Equation and also give expression for density of a gas.　　　4

(b) Explain Millikan's oil drop experiment to determine the charge of an electron.　　　4

7.(a) Define Hybridization and explain sp^2 – hybridization　　　4

(b) Describe Glass Calorimeter for determination of enthalpy of a substance.　　　4

8.(a) State Le-Chatelier's Principle. Discuss the effect of change in pressure on equilibrium position.　　　4

(b) Describe $Zn – Cu$ Galvanic Cell and explain the function of salt bridge.　　　4

9.(a) Derive Arrhenius Equation.　　　4

(b) 9.2 molar $HClO_4$ is available from the market. The density of this solution is $1.54\ g\ Cm^{-3}$. What is the percentage by weight of $HClO_4$?　　　4