Roll No. : _____

Objective Paper Code **6485**

Intermediate Part First

CHEMISTRY (Objective) GROUP - I

Time: 20 Minutes 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 the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.**

FSD-1-24

S.#	Questions	A	B	C	D
1	The number of neutrons present in $^{39}_{19}K$ is:	39	18	20	19
2	Which is a pseudo solid?	CaF_2	Glass	$NaC\ell$	$KC\ell$
3	When $a \neq b \neq c$ and $\alpha = \gamma = 90°$, $\beta \neq 90°$ then it is:	Monoclinic	Diclinic	Triclinic	Polyclinic
4	Density of an ideal gas can be calculated by the formula:	PV = dRT	PM = dPV	$d = \frac{RT}{PM}$	$d = \frac{PM}{RT}$
5	One atmosphere is equal to:	760mm of Hg	1000mm of Hg	760cm of Hg	20 psi
6	The comparative rates at which the solutes move in paper chromatography, depend on:	The size of the paper	R_f values of solutes	Temperature of the experiment	Size of the chromatogram
7	The drying agent used in desiccator is:	$NaC\ell$	KBr	$CaC\ell_2$	$BaC\ell_2$
8	The number of moles of CO_2 which contain 8.0g oxygen:	0.25	0.50	1.0	1.50
9	The mass of one mole of electrons is:	1.008g	0.55mg	0.184g	1.673mg
10	Glucose is converted into ethanol by the enzyme _____ present in yeast.	Urease	Invertase	Sucrose	Zymase
11	If the salt bridge is not used between two half cells, then the voltage:	Decrease rapidly	Decrease slowly	Does not change	Drops to zero
12	A solution of glucose is 10% $\frac{w}{v}$. The volume in which 1g mole of it is dissolved will be:	$1dm^3$	$1.8dm^3$	$200cm^3$	$900cm^3$
13	pH of pure water is:	4.4	5.4	7.0	8.0
14	One calorie is equivalent to:	0.4184J	41.84J	4.184J	418.4J
15	Which element has smaller size?	Na	K	$A\ell$	Li
16	Which molecule has zero dipole moment?	NH_3	$CHC\ell_3$	H_2O	BF_3
17	The number of electrons in the outermost shell of chloride ($C\ell^-$) ion is:	17	03	01	08

Intermediate Part First Roll No. _____

CHEMISTRY (Subjective) GROUP - I

Time: 02:40 Hours Marks: 68 FSD-I-24

SECTION – I

2. **Write short answers of any EIGHT parts.** 16
   (i) Calculate average atomic mass of neon.
   (ii) Define molar volume. Give one example.
   (iii) What is the function of electric field in mass spectrometer?
   (iv) How crystals are dried in an oven?
   (v) Write any two uses of chromatography.
   (vi) Define crystallization.
   (vii) Write any four properties of gases.
   (viii) Convert 40°C into Kelvin scale.
   (ix) Write two faulty assumptions of kinetic molecular theory.
   (x) Differentiate between reversible and irreversible reactions.
   (xi) State law of mass action.
   (xii) State common ion effect.

3. **Write short answers of any EIGHT parts.** 16
   (i) What are dipole dipole forces? Give one example.
   (ii) Name the factors which affect the London forces.
   (iii) Cleavage of crystals is itself anisotropic behaviour. Explain.
   (iv) Why ice occupies 9% more volume than liquid water?
   (v) Why cathode rays are also called as electrons?
   (vi) Write any four properties of positive rays.
   (vii) Define spectrum and name any two types of spectrums.
   (viii) For azimuthal quantum number, $\ell = 2$ and $\ell = 3$; calculate total values of magnetic quantum number.
   (ix) Define solubility curve. Name its two types.
   (x) Sum of mole fractions of a mixture is always equal to unity. Justify.
   (xi) What do you mean by order of reaction? Give two examples.
   (xii) What is the effect of temperature on rate of chemical reaction?

4. **Write short answers of any SIX parts.** 12
   (i) Name the factors influencing the ionization energy.
   (ii) How sigma and pi bonds are formed?
   (iii) Draw the structure of ethene ($CH_2=CH_2$) using sp^2 hybridization approach.
   (iv) The bond angles of H_2O and NH_3 are not 109.5° like CH_4. Give reason.
   (v) Define system and surroundings.
   (vi) What is standard enthalpy of atomization? Give an example.
   (vii) Differentiate between endothermic and exothermic reactions.
   (viii) Define (a) Electrolysis (b) Oxidation state.
   (ix) A salt bridge maintains electrical neutrality in the cell. Give reason.

SECTION – II Attempt any THREE questions. Each question carries 08 marks.

5. (a) How can we determine the percentage of carbon, hydrogen and oxygen in the given organic compound by combustion analysis? 04
   (b) Define the boiling point. Explain the variation of boiling point with external pressure. 04

6. (a) Discuss defects of Bohr's atomic model. 04
   (b) 250cm^3 of a sample of hydrogen effuses four times as rapidly as 250cm^3 of an unknown gas. Calculate the molar mass of unknown gas. 04

7. (a) Write postulates of VSEPR Theory. Also explain the structures of AB_3 type molecules in detail. (Any two molecules) 02,02
   (b) $N_2(g)$ 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: $N_2(g)+3H_2(g) \rightleftharpoons 2NH_3(g)$ 04

8. (a) Differentiate between spontaneous and non-spontaneous reactions with examples. 04
   (b) Write four important industrial applications of electrolysis. 04

9. (a) Describe phenol-water system in detail for partially miscible liquid. 04
   (b) Write any four characteristics of a catalyst. 04

Roll No. : _____

Objective
Paper Code
6486

Intermediate Part First

CHEMISTRY (Objective) GROUP - II

Time: 20 Minutes 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 the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.**

S.#	Questions	A	B	C	D
1	The wavenumber of the light emitted by a certain source is $2\times10^6\ m^{-1}$. The wavelength of this light will be:	500nm	500m	200nm	5×10^7m
2	Ionic solids are characterized by:	Low melting point	High vapour pressure	Good conductivity in solid state	Solubility in polar solvents
3	In order to mention the boiling point of water at 110°C, the external pressure should be:	Between 760 torr and 1200 torr	Between 200 torr and 760 torr	765 torr	Any value of pressure
4	Equal _____ of ideal gases at the same temperature and pressure contains _____ number of molecules.	Masses ; Equal	Volume ; Equal	Moles ; Unequal	Volume ; Unequal
5	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
6	Solvent extraction is particularly useful technique for the 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
7	The most common laboratory example of solvent extraction is called:	Ether extraction	Distillation	Sublimation	Crystallization
8	1 mole of glucose has _____ number of hydrogen atoms.	6×22.414	$12\times6.02\times10^{23}$	$6\times6.02\times10^{23}$	$24\times6.02\times10^{23}$
9	The number of moles of CO_2 which contains 8g of oxygen:	0.25	0.50	1.0	1.50
10	In zero order reaction, the rate is independent of:	Temperature of reaction	Concentration of reactants	Concentration of products	None of these
11	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 dissolves	No reaction takes place
12	The molal boiling point constant is the ratio of the elevation in boiling point to the:	Molarity	Molality	Mole fraction of solvent	Mole fraction of solute
13	Which combination is an acidic buffer?	A $HC\ell + NaC\ell$		C $NH_4OH + NH_4C\ell$	
		B $CH_3COOH + CH_3COONa$		D $NaOH + NaC\ell$	
14	Which system is endothermic as well as spontaneous?	A $H_2O(\ell) \rightarrow H_2O(g)$		C $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$	
		B $H_2O(g) \rightarrow H_2O(\ell)$		D $NaOH(aq) + HC\ell(aq) \rightarrow NaC\ell(aq) + H_2O(\ell)$	
15	Which molecule has zero dipole moment?	BF_3	H_2O	NH_3	$CHC\ell_3$
16	The bond order of Ne_2 is:	Two	Three	One	Zero
17	When 3d orbital is completely filled the entering electron goes to:	4s	4p	4f	5s

Intermediate Part First

Roll No. _____

CHEMISTRY (Subjective) GROUP - II

Time: 02:40 Hours Marks: 68

SECTION – I

2. **Write short answers of any EIGHT parts.** 16

(i) Many reactions taking place in our surrounding involve limiting reactant. Justify with examples.
(ii) Define mole with example.
(iii) Discuss reason for low actual yield.
(iv) Describe sintered glass crucible.
(v) Discuss folding of filter paper briefly.
(vi) Give uses of chromatography.
(vii) Define effusion with one example.
(viii) Explain Boyl's law from kinetic molecular theory of gases.
(ix) Derive units of 'a' and 'b' used in van der Waals equation of real gas.
(x) How K_c is used to predict direction of reaction?
(xi) Discuss effect of pressure change on reaction $2SO_2(g)+O_2(g) \rightleftharpoons 2SO_3(g)$
(xii) Define pK_a and pK_b

3. **Write short answers of any EIGHT parts.** 16

(i) Complete these nuclear reactions: (a) $^4_2He + ^9_4Be \rightarrow$ (b) $^{14}_7N + ^1_0n \rightarrow$
(ii) Differentiate between continuous and line spectrum.
(iii) Calculate ionization energy of H-atom.
(iv) Give relationship between (a) Energy and Frequency (b) Frequency and wavelength
(v) What are advantages of vacuum distillation?
(vi) Evaporation is a cooling process. Explain why?
(vii) The crystals showing isomorphism mostly have the same atomic ratios. Explain the statement.
(viii) Molecular solids are relatively soft. Why?
(ix) Define upper consulate temperature.
(x) What are azeotropic mixture?
(xi) What do you mean by poisoning of a catalyst?
(xii) What do you mean by heterogeneous catalysis? Give two examples.

4. **Write short answers of any SIX parts.** 12

(i) Why size of anion is always larger than its neutral atom?
(ii) Why second ionization energy is greater than first?
(iii) Define bond length. Give two factors affecting bond length.
(iv) Define bond order. Give its formula.
(v) Burning of candle is spontaneous process. Justify.
(vi) Define enthalpy of combustion. Give one example.
(vii) Why enthalpy of some compounds cannot be measured directly?
(viii) What is anodized aluminum? Give its use.
(ix) What is the function of salt bridge?

SECTION – II Attempt any THREE questions. Each question carries 08 marks.

5. (a) What is limiting reactant? How does it control the quantity of the product formed? Explain with three examples. 04
(b) What are covalent solids? Discuss six properties of covalent solids in detail. 04

6. (a) What pressure is exerted by a mixture of 2.00g of H_2 and 8.00g of N_2 at 273K in a $10dm^3$ vessel? 04
(b) Write four defects of Bohr's model. 04

7. (a) Define orbital hybridization and explain the structure of ethyne (C_2H_2) according to hybridization concept. 01,03
(b) The solubility product of Ag_2CrO_4 is 2.6×10^{-2} at 25°C. Calculate the solubility of the compound. 04

8. (a) Explain Hess's law of constant heat summation giving one example. 04
(b) Describe the construction and working of galvanic cell. 04

9. (a) Explain the measurement of boiling point elevation by Landsberger's method. 04
(b) Explain the effect of concentration of reactants on rate of reaction. 04