

FBD-42-21

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	Bohr model of atom is contradicted by:	Plank's quantum theory	Dual nature of matter	Heisenberg's uncertainty principle	All of these
2	Quantum number values for 2p orbitals are:	$n = 2, \ell = 1$	$n = 1, \ell = 2$	$n = 1, \ell = 0$	$n = 2, \ell = 0$
3	Which is a pseudo solid?	$\text{CaF}_2$	Glass	$\text{NaCl}$	All of these
4	Which is not an isomorphous pair?	$\text{NaNO}_3, \text{KNO}_3$	$\text{MgO}$ and $\text{NaF}$	$\text{K}_2\text{SO}_4$ and $\text{K}_2\text{Cr}_2\text{O}_7$	$\text{NaF}$ and $\text{CaCl}_2$
5	Number of molecules in one $\text{dm}^3$ of water is close to:	$\frac{6.02}{22.4} \times 10^{23}$	$\frac{12.04}{22.4} \times 10^{23}$	$\frac{18}{22.4} \times 10^{23}$	$55.6 \times 6.02 \times 10^{23}$
6	Equal masses of methane and oxygen are mixed in an empty container at $25^\circ\text{C}$ . The fraction of total pressure exerted by oxygen is:	$\frac{1}{3}$	$\frac{8}{9}$	$\frac{1}{9}$	$\frac{16}{17}$
7	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
8	The ratio of actual yield to theoretical yield multiplied by 100 is called:	Complex yield	Experimental yield	%age yield	None of these
9	The calculation based on balanced chemical equation is called:	Complex calculation	Stoichiometric calculation	Non-stoichiometric calculation	None of these
10	The unit of the rate constant is the same as that of the rate of reaction in:	First order reaction	Second order reaction	Zero order reaction	Third order reaction
11	If the salt bridge is not used between two half cells, then voltage:	Decrease rapidly	Decrease slowly	Does not change	Drops to zero
12	The pH of buffers can be calculated by:	Henderson equation	Nerst equation	Kinetic equation	Arrhenius equation
13	Less soluble $\text{KClO}_3$ is precipitated from its solution by common ion effect on adding:	$\text{HCl}$	$\text{KCl}$	$\text{H}_2\text{S}$	$\text{NaCl}$
14	For which system does the equilibrium constant, $K_c$ has units of $(\text{concentration})^{-1}$ :	$\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3$	$\text{H}_2 + \text{I}_2 \rightleftharpoons 2\text{HI}$	$2\text{NO}_2 \rightleftharpoons \text{N}_2\text{O}_4$	$2\text{HF} \rightleftharpoons \text{H}_2 + \text{F}_2$
15	If an endothermic reaction is allowed to take place very rapidly in the air, the temperature of the surrounding air:	Remains constant	Increases	Decreases	Remains unchanged
16	Octet rule is not followed in the formation of:	$\text{NF}_3$	$\text{CF}_4$	$\text{CCl}_4$	$\text{PCl}_5$
17	Which species has unpaired electrons in antibonding molecular orbitals?	$\text{O}_2^+$	$\text{N}_2^-$	$\text{B}_2$	$\text{F}_2$

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**SECTION - I**

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

- (i) No individual neon atom has a mass of 20.18 amu.
- (ii) What is a limiting reactant?
- (iii) What is percentage yield? Give its importance.
- (iv) Define sublimation. Give example.
- (v) What is solvent extraction?
- (vi) Derive Avogadro's Law from KMT.
- (vii) Give characteristics of plasma.
- (viii) What is law of distribution of velocities?
- (ix) What is centigrade scale of temperature?
- (x) Give two differences between ideal and non-ideal solutions.
- (xi) Define solubility and solubility curves.
- (xii) Define enthalpy or heat of solution.

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

- (i) Define polymorphism by giving one example.
- (ii) Define unit cell. Write dimensions of unit cell.
- (iii) What is difference between crystal and crystallite?
- (iv) Why  $H_2O$  is liquid and  $H_2S$  is gas at room temperature?
- (v) Why the positive rays are also called canal rays?
- (vi) Why alpha rays are bounced back in Rutherford experiment?
- (vii) Calculate mass of electron by using e/m value.
- (viii) What is difference between orbit and orbital?
- (ix) Define acidic and basic buffers.
- (x) Define common ion effect by giving one example.
- (xi) Define rate determining step by giving one example.
- (xii) Define energy of activation.

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

- (i) How electronegativity helps us to understand the nature of bond?
- (ii) Differentiate between ionic and covalent bond.
- (iii) Why some covalent bonds are polar while others are non-polar?
- (iv) What is oxonium ion? How it is formed?
- (v) What is enthalpy?
- (vi) What is standard enthalpy of a reaction?
- (vii) Calculate oxidation number of manganese in  $KMnO_4$ .
- (viii) Calculate oxidation number of sulphur in sulphate ions.
- (ix) Define electrode potential.

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**SECTION - II**

Attempt any THREE questions. Each question carries 08 marks.

5. (a) Calculate the number of grams of  $K_2SO_4$  and water produced when 14g of KOH are reacted with excess of  $H_2SO_4$ .  $2KOH + H_2SO_4 \rightarrow K_2SO_4 + 2H_2O$

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- (b) Explain the following properties of crystalline solids. Give one example in each case:

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- (i) Anisotropy (ii) Symmetry (iii) Polymorphism (iv) Habit of a crystal

6. (a) Derive general gas equation for one mole of a gas from gas laws at S.T.P.

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- (b) What is spectrum? Explain atomic emission spectrum and atomic absorption spectrum.

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7. (a) Give the postulates of VSEPR theory.

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- (b) Explain these terms: (i) Standard heat of neutralization (ii) Standard enthalpy of solution

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8. (a)  $N_2(g)$  and  $H_2(g)$  combine to give  $NH_3(g)$ . The value of  $K_c$  in this reaction at  $500^\circ C$  is  $6.0 \times 10^{-2}$ . Calculate the value of  $K_p$  for this reaction.

- (b) (i) Define activation energy and activated complex. (ii) What is meant by specific rate constant?

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9. (a) Explain Landsberger's method for the measurement of boiling point elevation.

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- (b) Define electrochemical series. Write its any two applications.

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