

CHEMISTRY
GROUP : FIRSTTIME: 20 MINUTES
MARKS: 17

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.

QUESTION NO. 1

- 1 The largest number of molecules are present in
(A) 3.6 g of H_2O (B) 4.8 g of C_2H_5OH (C) 2.8 g of CO (D) 5.4 g of N_2O
- 2 Many elements have fractional atomic masses. This is because
(A) The mass of the atom is itself fractional (B) Atomic masses are average masses of isobars
(C) Atomic masses are average masses of isotopes
(D) Atomic masses are average masses of isotopes proportional to their relative abundance
- 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 solvent commonly used in solvent extraction is
(A) Methyl alcohol (B) Diethyl ether (C) Liquid ammonia (D) Hydrochloric acid
- 5 How should the conditions be changed to prevent the volume of a given gas from expanding when its mass is increased?
(A) Temperature is lowered and pressure is increased (B) Temperature is increased and pressure is lowered
(C) Temperature and pressure both are lowered (D) Temperature and pressure both are increased
- 6 The order of the 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) $NH_3 > CO_2 > Cl_2 > SO_2$
- 7 In order to raise the boiling point of water upto $110^\circ C$, the external pressure should be
(A) Between 760 torr and 1200 torr (B) Between 200 torr and 760 torr
(C) 765 torr (D) Any value of pressure
- 8 Ionic solids are characterized by
(A) Low melting points (B) Good conductivity in solid state (C) High vapour pressures
(D) Solubility in polar solvents
- 9 When 6 d orbital is complete, the entering electron goes into
(A) 7 f (B) 7 s (C) 7 p (D) 7 d
- 10 Rutherford's model of atom failed because
(A) The atom did not have a nucleus and electrons
(B) It did not account for the attraction between protons and neutrons
(C) It did not account for the stability of the atom
(D) There is actually no space between the nucleus and the electrons
- 11 Which one has perfectly triangular shape?
(A) $SnCl_2$ (B) CO_2 (C) SO_3 (D) NH_3
- 12 Which of the hydrogen halides has the highest percentage of ionic character?
(A) HCl (B) HBr (C) HF (D) HI
- 13 If an endothermic reaction is allowed to take place very rapidly in the air, the temperature of the surrounding air
(A) Remains constant (B) Increases (C) Decreases (D) Remains unchanged
- 14 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^+ , Ba^{2+} and NO_3^- (C) Ba^{2+} and NO_3^- only (D) Ba^{2+} , NO_3^- and Cl^-
- 15 18 g glucose is dissolved in 90 g 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 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
- 17 In the rate equation of a reaction $2A + B \rightarrow$ products is, rate = $k[A]^2[B]$, and A is present in large excess, then order of reaction is
(A) 1 (B) 2 (C) 3 (D) None of these

CHEMISTRY
GROUP : FIRSTSUBJECTIVE
SECTION-ITIME : 2:40 HOURS
MARKS : 68

QUESTION NO. 2 Write short answers of any Eight (8) parts of the following

16

- i Law of conservation of mass has to obeyed during stoichiometric calculations. Give reason
- ii Why elements have fractional atomic masses ?
- iii Why we use the term relative atomic mass ?
- iv Why regular air cannot be used by sea divers ?
- v Real Gas show non ideal behavior Why ?
- vi Give any two applications of plasma
- vii Define Rf value and why it has no unit ?
- viii Differentiate between stationary and mobile phase
- ix Give applications of paper chromatography
- x Draw out and Labelled the Bomb calorimeter
- xi Burning of candle is spontaneous process. Justify it
- xii Justify Hess's law with an example

QUESTION NO. 3 Write short answers of any Eight (8) parts of the following

16

- i Define hydrogen bonding
- ii Why evaporation causes cooling ?
- iii What is meant by anisotropy ?
- iv Differentiate between Allotropy and Polymorphism
- v State Hund's rule with example
- vi Why e/m value of cathode rays is equal to electron ?
- vii Differentiate between fast and slow neutrons
- viii Positive rays are also called canal rays why ?
- ix What are hydrates ? Give one example
- x Describe continuous solubility curve with graph and example
- xi What is negative catalysis. Give example
- xii Define half life period. What is its importance ?

QUESTION NO. 4 Write short answers of any Six (6) parts of the following

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- i Differentiate between bonding molecular orbital and antibonding molecular orbital
- ii Why do the lone pairs of electrons occupy more space than the bond pairs ?
- iii The dipole moments of CH₄ and CO₂ are zero but that of H₂O is 1.85 D. Why ?
- iv The size of anion is larger than its parents neutral atom. Give the reason
- v Define standard enthalpy of neutralization. Give an example
- vi Differentiate between spontaneous and non-spontaneous process
- vii Why is it necessary to mention the physical states of the reactants and products in thermochemical equations ?
- viii How can copper be purified electrolytically ?
- ix Differentiate between electrolytic and voltaic cell

SECTION-II**Note: Attempt any Three questions from this section**

Q.5 (A)	Define the following terms and give two examples of each (i) Gram Formula (ii) Gram ion (iii) Gram atom (iv) Percentage yield $(\frac{1}{2} + \frac{1}{2}) \times 4 = 4$	
(B)	Explain Planck's quantum theory of radiations and derive the relation $E = h c \bar{\nu}$	4
Q.6 (A)	Calculate the density of CH ₄ (g) at 0 °C and 1 atmospheric pressure, What will happen to the density if temperature is increased to 27 °C	2+2
(B)	Describe the construction and working of standard hydrogen electrode	2+2
Q.7 (A)	Draw the molecular orbital picture of O ₂ molecule and also explain its paramagnetic nature	3+1
(B)	Define the following with suitable example (i) Enthalpy of Neutralization (ii) Enthalpy of formation	2+2
Q.8 (A)	Explain properties of ionic solids	4
(B)	What is the percentage ionization of acetic acid in a solution in which 0.1 mol of it has been dissolved per dm ³ of the solution	4
Q.9 (A)	Define hydrolysis. Explain it with two examples	1+3
(B)	Define enzyme. Mention three characteristics of enzyme catalysis	1+3