

SGD-11-G1-P1

1123 Warning:- Please write your Roll No. in the space provided and sign Roll No-----
(Inter Part - I) (Session 2019-21 to 2022-24) Sig. of Student -----

Chemistry (Objective)

(Group - I)

Paper (I)

Time Allowed:- 20 minutes

PAPER CODE 2481

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 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. Write **PAPER CODE**, which is printed on this question paper, on the both sides of the Answer Sheet and fill bubbles accordingly, otherwise the student will be responsible for the situation. Use of Ink Remover or white correcting fluid is not allowed.

Q. 1

- 1) The volume occupied by 1.4 g of N_2 at S.T.P. is
(A) 1.12 dm^3 (B) 2.24 dm^3 (C) 22.4 dm^3 (D) 112 cm^3
- 2) Which of the following is a monoisotopic element.
(A) Silver (B) Calcium (C) Chlorine (D) Fluorine
- 3) Which of the following can be sublime.
(A) Calcium (B) NaCl (C) Naphthalene (D) Na_2CO_3
- 4) Constant factor in charlie's law.
(A) Volume (B) Pressure (C) Temperature (D) Both V and T
- 5) The order of rate of diffusion of gases NH_3 , SO_2 , Cl_2 and CO_2 is
(A) $NH_3 > CO_2 > SO_2 > Cl_2$ (B) $NH_3 > SO_2 > Cl_2 > CO_2$ (C) $Cl_2 > SO_2 > CO_2 > NH_3$ (D) $NH_3 > CO_2 > Cl_2 > SO_2$
- 6) Which of the following is amorphous solid
(A) NaCl (B) Glass (C) NaBr (D) CaF_2
- 7) Which of the following has highest vapour pressure at $25^\circ C$.
(A) Mercury (B) Ethanol (C) CCl_4 (D) Chloroform
- 8) When 6d orbital is complete the entering electron goes into
(A) 7f (B) 7s (C) 7d (D) 7p
- 9) Number of bonds in nitrogen molecule is
(A) One σ and one π (B) Three sigma (C) Two sigma and one π (D) One σ and Two π
- 10) Units of energy in which heat changes in S.I system are.
(A) Joule (B) Torr (C) Erg (D) Newton
- 11) The net heat change in a chemical reaction is same weather the reaction completes in one step or several steps. It is known as
(A) Henry's law (B) Joule's principle (C) Hesse's law (D) Law of conservation of energy
- 12) Mixture of NH_4OH and NH_4Cl makes a buffer whose pH is
(A) less than seven (B) 7 (C) More than seven (D) 4
- 13) For the reaction $N_2 + 3H_2 \rightleftharpoons 2NH_3$, The pressure at optimum condition is.
(A) 100 atm (B) 600 atm (C) 200-300 atm (D) 1000 atm
- 14) Molarity of pure water is.
(A) 01 (B) 55.5 (C) 18 (D) 8
- 15) 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 dissolved (D) No reaction takes place
- 16) Oxidation number of Mn in $KMnO_4$ is
(A) +5 (B) +7 (C) +3 (D) +2
- 17) The unit of 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

1123 -- 1123 -- 18000 (1)

1123 (Inter Part - I) Warning:- Please, do not write anything on this question paper except your Roll No.

Chemistry (Subjective) (Session 2019-21 to 2022-24) Group (I) Paper (I)

Time Allowed: 2.40 hours Section ----- I

Maximum Marks: 68

2. Answer briefly any Eight parts from the followings:-

8 × 2 = 16

- (i) N₂ and CO have the same number of electrons, protons and neutrons. (ii) 'Mg' atom is twice heavier than that of carbon atom. (iii) How can the efficiency of a chemical reaction can be expressed? (iv) List the four postulates of Kinetic molecular theory of gases. (v) What are characteristics of plasma? (vi) Throw some Light on the factor $\frac{1}{273}$ in charle's Law.

(vii) The e/m value of positive rays for different gases are different but those for cathode rays the e/m values is the same. Justify it. (viii) What are the defects of Bohr's atomic model.

(ix) Compare line emission and line absorption spectra. (x) What is a spontaneous process? Give examples

(xi) Why is it necessary to mention the physical states of reactant and products in a thermochemical equation? (xii) Define state and state function's with one example for each.

3. Answer briefly any Eight parts from the followings:-

8 × 2 = 16

- (i) What is parts per million. Write its formula? (ii) What are the conditions should be fulfilled to observe colligative properties. (iii) Define hydrates. Give example. (iv) What is activation of catalyst. Give one example? (v) How surface area has effect on the rate of reaction? (vi) Catalyst are specific in their action. (vii) Why sintered glass crucible is better than gouch crucible? (viii) Write down major steps involved in complete quantitative analysis. (ix) How mixture of sand and naphthalene can be separated? (x) Earthenware vessel keep water cool. Justify. (xi) Define symmetry. What are symmetry elements. (xii) Ionic solids are highly brittle in nature.

--(02)--

6 × 2 = 12

4. Answer briefly any Six parts from the followings:-

(i) Define Bond Energy? (ii) A Salt Bridge maintains the electrical neutrality in the cell. Justify it.

(iii) Why cationic radius is smaller than atomic radius?

(iv) Why 2nd Ionization Energy is always greater than first Ionization Energy?

(v) What is pK_b? Give its significance. (vi) Define pH?

(vii) What does mean by chemical Equilibrium?

(viii) What is oxidation number? Give example. (ix) Define Electrolysis.

(8 × 3 = 24)

Section ----- II

Note: Attempt any three questions.

5. (a) Describe combustion analysis for the determination of percentage of C, H and O in an organic compound.

(b) Calculate the mass of 1 dm³ of NH₃ gas at 30°C and 1000 mm Hg pressure, considering that NH₃ is behaving ideally.

6. (a) Describe Manometric method for determination of vapour pressure of a liquid with a diagram.

(b) What is Enthalpy of a reaction? How ΔH of a reaction is measured in Laboratory by glass calorimeter?

7. (a) Explain Heisenberg uncertainty principle.

(b) The solubility product of Ag₂CrO₄ is 2.6 × 10⁻² at 25°C. Calculate the solubility of compound. Atomic mass of Ag=108 Cr=52 O=16.

8. (a) What is orbital hybridization? Explain the structure of CH₄ molecule on the basis of hybridization theory.

(b) Describe the construction and working of standard hydrogen electrode (SHE).

9. (a) Explain continuous and discontinuous solubility curves. (b) Describe energy of activation in detail.

1124 - 1123 -- 18000

1125 Warning:- Please write your Roll No. in the space provided and sign. Roll No.-----
(Inter Part – I) (Session 2019-21 to 2022-24) Sig. of Student -----

Chemistry (Objective)

(Group - II)

Paper (I)

Time Allowed:- 20 minutes

PAPER CODE 2488

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 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. Write PAPER CODE, which is printed on this question paper, on the both sides of the Answer Sheet and fill bubbles accordingly, otherwise the student will be responsible for the situation. Use of Ink Remover or white correcting fluid is not allowed.

SG1D-11-672-P1

Q. 1

- 1) Which of the following has hydrogen bonding?
(A) CH₄ (B) CCl₄ (C) NH₃ (D) SiH₄
- 2) The electron affinity of chlorine is.
(A) -349 kJ mol⁻¹ (B) -249 kJ mol⁻¹ (C) -449 kJ mol⁻¹ (D) +396 kJ mol⁻¹
- 3) Acid having K_a > 1 will be .
(A) Weak (B) Very weak (C) Moderate (D) Strong
- 4) 18 g glucose is dissolved in 90 g of water. The relative lowering of vapour pressure is equal to
(A) 1/5 (B) 5.1 (C) 1/51 (D) 6
- 5) Orbitals having same energy are called:
(A) unhybrid orbitals (B) valence orbitals (C) degenerate orbitals (D) d-orbitals
- 6) The volume of 1.6g of CH₄ at S.T.P is
(A) 1.12 dm³ (B) 2.24 dm³ (C) 22.41 dm³ (D) 112 dm³
- 7) Partial pressure of oxygen in air at sea level is.
(A) 149 torr (B) 154 torr (C) 159 torr (D) 164 torr
- 8) In silver oxide battery, the cathode is made up of:
(A) AgO (B) Ag₂O (C) Ag₂O₃ (D) Ag
- 9) For the reaction NaOH + HCl → NaCl + H₂O the change in enthalpy is called:
(A) Heat of reaction (B) Heat of formation (C) Heat of neutralization (D) Heat of combustion
- 10) Stronger the oxidizing agent, greater is the:
(A) oxidation potential (B) reduction potential (C) redox potential (D) E.M.F of cell
- 11) The rate of reaction.
(A) increases as the reaction proceeds (B) decreases as the reaction proceeds (C) remains the same as the reaction proceeds (D) may decrease or increase as the reaction proceeds
- 12) The largest number of molecules are present in:
(A) 3.6 g of H₂O (B) 4.8 g of C₂H₅OH (C) 2.8 g of CO (D) 5.4 g of N₂O₅
- 13) Solvent extraction method is a particularly useful technique for separation when the product to be separated is.
(A) non-volatile or thermally unstable (B) volatile or thermally stable (C) non-volatile or thermally stable (D) volatile or thermally unstable
- 14) The order of the rate of diffusion of gases NH₃, SO₂, Cl₂ and CO₂ is:
(A) NH₃>SO₂>Cl₂>CO₂ (B) NH₃>CO₂>SO₂>Cl₂ (C) Cl₂>SO₂>CO₂>NH₃ (D) NH₃>CO₂>Cl₂>SO₂
- 15) In order to raise the boiling point of water upto 110°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
- 16) Which of the following molecules has zero dipole moment?
(A) NH₃ (B) CHCl₃ (C) H₂O (D) BF₃
- 17) The pH of 10⁻³ mol dm⁻³ of an aqueous solution of H₂SO₄ is
(A) 3.0 (B) 2.7 (C) 2.0 (D) 1.5

1125 -- 1123 -- 15000 (4)

1123 (Inter Part - I) Warning:- Please, do not write anything on this question paper except your Roll No.
Chemistry (Subjective) (Session 2019-21 to 2022-24) Group (II) Paper (I)

Time Allowed: 2.40 hours Section ----- I Maximum Marks: 68

2. Answer briefly any Eight parts from the followings:-

8 × 2 = 16

- (i) Define gram atomic mass and gram molecular mass. (ii) Define molecular ion. Give one example.
(iii) Mg atom is twice heavier than that of carbon atom. Give reason. *SGD-11-672-P2*
(iv) State Graham's Law of diffusion. Write its mathematical form.
(v) How the process of respiration obeys the Dalton's law of partial pressure.
(vi) Give verification of Boyle's law from kinetic molecular theory of gases.
(vii) Why e/m value of cathode rays is just-equal to that of electron.
(viii) State Moseley's law. Give its Mathematical expression.
(ix) What is orbital? Draw the shape of p-orbital. (x) Define Enthalpy of Atomization. Give one example.
(xi) What are spontaneous and non-spontaneous processes. Give one example for each.
(xii) State Hess's law of constant heat summation. Write its mathematical form.

3. Answer briefly any Eight parts from the followings:-

8 × 2 = 16

- (i) Define sublimation giving two examples.
(ii) Give salient features of a solvent used in process of crystallization.
(iii) Describe most safe and reliable method for drying of crystals.
(iv) Why melting point and boiling point of halogens increases down the group.
(v) Lower alcohols are soluble in water while hydrocarbons are insoluble. Give reason.
(vi) Cleavage of crystals is anisotropic property. Explain.
(vii) Why aqueous solution of NH_4Cl is acidic in nature.
(viii) Define solubility with two examples. (ix) Why NaCl and KNO_3 are used to lower melting point of ice.
(x) Define the term energy of activation. (xi) A catalyst is specific in its action. Justify it.
(xii) Rate of reaction decreases with passage of time. Justify it.

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4. Answer briefly any Six parts from the followings:-

6 × 2 = 12

- (i) Define electronegativity. How does it vary in the group of periodic table?
(ii) Pi (π) bonds are more diffused than sigma bonds. Give the reason.
(iii) Define coordinate covalent bond. Give an example.
(iv) How can we prepare basic buffers? Give an example.
(v) Calculate the pH of 10^{-4} mole dm^{-3} of $\text{Ba}(\text{OH})_2$. (vi) Give two applications of common ion effect.
(vii) What is standard hydrogen electrode (SHE)?
(viii) Give the electrode reactions during the recharging of lead accumulator.
(ix) Calculate the oxidation number of Cr in $\text{Cr}_2(\text{SO}_4)_3$ and $\text{Cr}_2\text{O}_7^{2-}$

(8 × 3 = 24)

Section ----- II

Note: Attempt any three questions.

5. (a) Explain evidence of atoms with the help of diagram.
(b) 250 cm^3 of hydrogen is cooled from 127°C to -27°C by maintaining the pressure constant. Calculate the new volume of the gas at Low temperature.
6. (a) Explain molecular solids in detail.
(b) State and explain Hess's law of constant Heat summation with two examples.
7. (a) Write down any four properties of cathode rays.
(b) What is the percentage ionization of acetic acid in a solution in which 0.1 Mole of it has been dissolved per dm^3 of the solution.
8. (a) Explain paramagnetic nature of oxygen on the basis of MOT.
(b) Describe the construction and working of standard hydrogen electrode (SHE).
9. (a) Explain phenol-water system in detail.
(b) Write down any four characteristics of catalyst.

1126- 1123- 15000