

Note: There are three sections in this paper i.e. A, B & C.

VERSION: A

Instructions:

- Please attempt Section-A on the MCQs Answer Sheet only.
- Only black ball point or marker may be used for shading the relevant circle.
- Please make sure that there is no cutting, over writing, erasing, or multiple circles shading.

Time Allowed: 20 Minutes

"Section - A"

Marks: 18

Q.1. Choose the correct option i.e. A, B, C or D.

- How many mole of O_2 is formed by taking 4 moles of $KClO_3$? $KClO_3 \rightarrow KCl + O_2$
 (A) 1 mol (B) 4 mol (C) 6 mol (D) 8 mol
- The Paschen series of the hydrogen spectrum corresponds to transitions to which energy level?
 (A) $n = 3$ (B) $n = 4$ (C) $n = 5$ (D) $n = 6$
- Which of the following molecule has non tetrahedral structure?
 (A) $CHCl_3$ (B) CCl_4 (C) CH_4 (D) C_2H_4
- According to VSEPR theory the minimum repulsion between the electron pair is:
 (A) Bond pair- Bond pair (B) Lone pair- Lone pair (C) Lone pair- Bond pair (D) Depends upon nature of central atom
- A gas cannot be liquefied above its.
 (A) Boyle temperature (B) Inversion temperature (C) Critical temperature (D) Room temperature
- Which of the statement is true about hydrogen bonding?
 (A) Weaker than dipole forces (B) Occurs between non polar molecule (C) Requires specific orientation of molecule (D) Decreases boiling point of substance
- Polar substances have high value of
 (A) ΔH_{vap} (B) ΔH_{sub} (C) $\Delta H_{dissociation}$ (D) Both H_{vap} and H_{sub}
- Allotropy is the property of:
 (A) Elements (B) Ions (C) Compounds (D) Mixture
- If radius of MgO lies between 0.414-0.732, which of the following crystalline structure it exhibit?
 (A) Triangular planar (B) Linear (C) Tetrahedral (D) Octahedral
- Why does ice require a lot of energy to melt?
 (A) Due to its low density (B) Due to its high density (C) Due to its high heat of fusion (D) Due to its low heat of fusion
- For a reaction, $I_2 + H_2 \rightleftharpoons 2HI$ relationship of K_p and K_c is.
 (A) $K_p = K_c$ (B) $K_p > K_c$ (C) $K_p < K_c$ (D) $K_c = 0$
- For a reaction $2X(g) + Y(g) \rightleftharpoons 2Z(g)$ $\Delta H = \text{ive}$, Maximum product Z, will be formed at
 (A) 1000 atm and 500 $^{\circ}C$ (B) 500 atm and 500 $^{\circ}C$ (C) 1000 atm and 100 $^{\circ}C$ (D) 500 atm and 100 $^{\circ}C$
- What is pH of solution having pOH value is 2.5?
 (A) 6.5 (B) 9.5 (C) 10.5 (D) 11.5
- If 50ml of 0.1M HCl solution reacts with 50ml of 0.1M NaOH resultant salt solution will be.
 (A) Basic (B) Acidic (C) Neutral (D) Amphoteric
- If conc. CO is doubled, rate of reaction increases four time. What will be the order of reaction?
 (A) Zero (B) First (C) Second (D) Third
- The mass of glucose required to prepare 1 dm³ of 20% solution is
 (A) 18g (B) 180g (C) 36g (D) 200g
- Heat supplied at constant pressure is equal to $Ch_{p,c}-9168$
 (A) $\Delta H = q$ (B) $\Delta E = q$ (C) $\Delta H = \Delta V$ (D) $\Delta H = \Delta T$
- Oxidation state of carbon in $C_6H_{12}O_6$ is.
 (A) +4 (B) +3 (C) +2 (D) 0

Q-2. Write short answers to any ten (10) of the following parts. All parts carry equal marks:-

- (i) If 2 mol of oxygen react with 2g of hydrogen to form water which one is limiting reagent.
 $O_2 + H_2 \rightarrow H_2O$
- (ii) What is volume of 55g of ammonia at STP?
- (iii) What is energy difference when an electron jump from 5th shell to 6th shell for hydrogen atom.
- (iv) Draw MOT diagram for O_2 also tells about bond order and magnetic behavior.
- (v) Why hydrogen show positive deviation while CO_2 show negative deviation?
- (vi) Determine the relative rates of effusion for equal volume of N_2O and NO under same condition of pressure and temperature?
- (vii) What are units of surface tension, why falling rain drops (water) are nearly spherical?
- (viii) Why water has high heat of vaporization? What does it indicate?
- (ix) What is basic buffer, what happen when strong acid is added to ammonium Chloride and ammonium hydroxide buffer solution?
- (x) How catalyst increases rate of reaction, Justify your answer with graph.
- (xi) What are completely miscible and partially miscible liquids give example of each.
- (xii) Heat of formation of $C_3H_4(g)$, $CO_2(g)$ and $H_2O(g)$ in kJ/mol are + 185.4 , - 393 and -285.81 respectively. Calculate heat of combustion. $C_3H_4(g) + 4O_2(g) \rightarrow 3CO_2(g) + 2H_2O(g)$.
- (xiii) Balance redox equation by ion electron method (Acidic medium) $Cr_2O_7^{2-} + H_2S \rightarrow Cr^{3+} + S$.
- (xiv) How does pressure affect the equilibrium of gaseous reactions?

"Section – C"Marks: 27

Note: Answer any three (3) questions. All questions carry equal marks:-

- Q-3. (a) Calculate radius of 1st and 2nd shell for Lithium atom.
(b) Differentiate between sp and sp^3 hybridization with examples.
- Q-4. (a) Derive root mean square velocity and Grahams law of diffusion using kinetic molecular theory.
(b) What is lattice energy? How different factors effect lattice energy explain with example.
- Q-5. (a) An equilibrium mixture in $2dm^3$ container contains 10g N_2 0.6g H_2 PCl_5 of 1.6g of NH_3 . Find Kc for the reaction $N_{2(g)} + 3H_{2(g)} \rightarrow 2NH_{3(g)}$.
(b) How elevation of B.p and relative lowering of vapor pressure used to calculate Molar mass derive expression. Chqrc-9168
- Q-6. (a) When 1 mole of ice is melt at $0^\circ C$ at constant pressure of 2 atm 6025J heat is absorbed by system, the molar volume of ice and water are 0.2 and $0.18 dm^3$ respectively Calculate ΔE .
(b) Balance the given equation by oxidation number method.
 $NaCl + H_2SO_4 + MnO_2 \rightarrow Na_2SO_4 + MnSO_4 + Cl_2 + H_2O$