

Pune Vidyarthi Griha's
Muktangan English School & Jr. College, Pune - 9
Terminal Examination (2024-25)
Standard - XII

Subject - CHEMISTRY

Marks - 50

Date - 19-10-2024

Time - 1.30 p.m. to 4.00 p.m.

- Instructions :**
- 1) Use of log table is allowed. Use of Calculator is not allowed.
 - 2) Figures to the right indicate full marks.
 - 3) The question paper is divided into four sections.
 Section A : Each 1 mark Section B : Each 2 Marks
 Section C : Each 3 marks Section D : Each 4 Marks
 - 4) For each multiple choice question it is mandatory to write correct answer along with it's alphabets.
 - 5) Physical constant : $N_A = 6.022 \times 10^{23}$

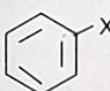
SECTION - A

Q.1 Select and write the correct answer for following multiple choice type of questions. (7)

(i) The relation between radius of an atom and edge length in body centered cubic lattice is given by the formula

- (a) $\sqrt{3}r = 4a$ (b) $r = \frac{\sqrt{3}}{a} \times 4$ (c) $r = \frac{\sqrt{3}}{4} a$ (d) $r = \frac{\sqrt{2}}{4} \times a$

(ii) The allylic halide, among the following is

- (a) $R - \underset{\substack{| \\ X}}{CH} - R$ (b) $CH_2 = CH - X$
- (c)  (d) $CH_2 = CH - CH_2 - X$

(iii) The K_{sp} for the sparingly soluble PbI_2 salt is

- (a) S^2 (b) $27S^4$
 (c) $4S^3$ (d) $3S^4$

(iv) The hybridization of nitrogen in primary amine is

- (a) sp (b) sp^2
 (c) sp^3 (d) sp^3d

(v) of the following compounds will have maximum acidic strength.

- (a) $C_2H_5 - OH$ (b) $(CH_3)_3C - OH$
 (c) $C_6H_5 - OH$ (d) $p - NO_2 - C_6H_4 - OH$

(vi) is an example of liquid in liquid type of solution.

- (a) Carbonated water (b) Gasoline
 (c) Metal alloys (d) Amalgams of metal

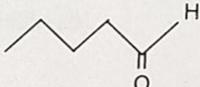
- (vii) Reduction of carboxylic acid with LiAlH_4 gives
- (a) ester (b) ether (c) alcohol (d) alkane

Q.2 Answer the following questions.

- (i) State the second law of thermodynamics.
- (ii) What are diamagnetic solids ?
- (iii) $\text{R} - \text{NO}_2 + \text{A} \xrightarrow{\text{Sn} / \text{HCl}} \text{R} - \text{NH}_2 + 2\text{H}_2\text{O}$
- (iv) What is Swartz reaction ?
- (v) What are tertiary amines ?
- (vi) Write structure of the product formed after bromination of amine.
- (vii) Write the unit of Henry's constant (K_H)

SECTION - B

Attempt any eight of the following questions.

- Q.3 Define :
- i) Substitutional impurity defect
ii) Interstitial impurity defect
- Q.4 Define extensive property. Write any two examples of it.
- Q.5 Write the reactions involved in conversion of ethanoyl chloride to
1) Propanone 2) acetaldehyde
- Q.6 Write the IUPAC name of following compounds.
- i) $\text{C}_6\text{H}_5 - \text{NH} - \text{C}_6\text{H}_5$ ii) 
- Q.7 Draw the structures of optical isomers of 2-Chlorobutane.
- Q.8 How will you prepare phenol from cumene ?
- Q.9 'The solubility of p-Nitrophenol in water is more than o-Nitrophenol.' Give reason.
- Q.10 What is acidic buffer ? Write the equation to calculate pH of acidic buffer.
- Q.11 a) Define Van't Hoff factor.
b) State Raoult's law
- Q.12 Write only balanced chemical equations for aldol condensation reaction of ethanal.
- Q.13 Predict the product :
- a) $\text{R} - \text{X} + \text{AgCN} (\text{alc}) \longrightarrow ?$
- b) $\text{R} - \text{X} + \text{R} - \text{COOAg} \longrightarrow ?$

SECTION - C

Attempt any four of the following questions.

(12)

- Q.14 Define osmosis. Derive an expression to determine molar mass of non-volatile solute by elevation of boiling point.
- Q.15 What is dehydrohalogenation reaction ? What is the action of alc.KOH on 2-Chlorobutane ? Write any two uses of freons.
- Q.16 300 mmol of an ideal gas occupies 13.7 dm^3 at 300K. Calculate the work done when the gas is expanded isothermally and reversibly until it's volume has increased by 2.3 dm^3 .
- Q.17 Explain amphoteric nature of water giving suitable chemical equations.
- Q.18 What is the action of following reagents on arene diazonium salt. $\text{Ar} - \text{N}_2^+ \text{X}^-$
- a) CuCl / HCl b) $\text{H}_3\text{PO}_2 / \text{H}_2\text{O}$ c) $\text{H}_2\text{O}, 283\text{K}$
- Q.19 Calculate the packing efficiency of metal crystal in simple cubic lattice.

SECTION - D

Attempt any two of the following questions.

(8)

- Q.20 Write the balanced chemical equation for the action of following reagents on acetaldehyde.
- a) HCN b) $\text{NH}_2 - \text{OH}$ c) 2 moles of $\text{C}_2\text{H}_5\text{OH}$ (stepwise reactions)
- Q.21 a) "Salt of strong acid and strong base does not undergo hydrolysis." Justify.
- b) What is the molar mass of solute if solution is prepared by dissolving 0.822 g of it in 0.3 dm^3 of water has an osmotic pressure 0.196 atm at 298 K ?
- Q.22 Write the general reactions for the action of
- i) $\text{R} - \text{Mg} - \text{X}$ on a) Formaldehyde b) Acetaldehyde
- ii) dil H_2SO_4 on a) $\text{R} - \text{O} - \text{R}$ b) $\text{Ar} - \text{O} - \text{R}$
- Q.23 a) Calculate standard enthalpy for the following reaction, from the given data.
- $$\text{Fe}_2\text{O}_3(\text{s}) + 3\text{CO}(\text{g}) \rightarrow 2\text{Fe}(\text{s}) + 3\text{CO}_2(\text{g})$$
- $\Delta_f H^\circ(\text{Fe}_2\text{O}_3) = -824 \text{ kJ/mol}$
 $\Delta_f H^\circ(\text{CO}) = -110 \text{ kJ/mol}$
 $\Delta_f H^\circ(\text{CO}_2) = -393 \text{ kJ/mol}$
- b) Define enthalpy of fusion.

