CLASS – XI.

SET - B

Time : 3hrs.

FINAL EXAM -2025
SUBJECT – CHEMISTRY

M. M.70

Note: Q. No. 1 has 20 parts carrying one mark each. Q. No. 2 to 15 carry 2 marks each. Q. No.16 to 19 carry 3 marks each Q. No. 20 to 21 carry 5 marks each.

Q.1-MCQ

(i) Which of the following is dependent on temperature ?
(a) Molality (b) mole fraction (c) molarity (d) mass percentage

(ii) What is the molar mass of 0.1 mol of glucose ($C_6H_{12}O_6$).
(a)16 $gmol^{-1}$ (b) 18 $gmol^{-1}$ (c) 20 $gmol^{-1}$ d) 22 $gmol^{-1}$

(iii) The mass percentage composition of water (H_2O) is approximately:
a)11.19%hydrogen, 88.81%oxygen (b) 5.90%hydrogen 94.10%oxygen (c) 50%hydrogen 50%oxygen
(d) 10%hydrogen 90%oxygen

(iv) What is the conjugate base of H_2O?
(a) H^+ (b) H_3O^+ (c) OH^- (d) H^-

(v) Which of the following favours the backward reaction in a chemical equilibrium ?
(a) Increasing the concentration of reactant (b) Increasing the concentration of product (c) Removal of product (d) None of the above

(vi) The molecule which has zero dipole moment is:
(a) CH_2Cl_2 (b) BF_3 (c) NF_3 (d) ClO_2

(vii) Which of the following is extensive property
(a) Molar heat capacity (b)Temperature (c) Enthalpy (d) All of these

(viii) The oxidation number of Fe in $K_4[Fe(CN)_6]$ is
a) +3 (b) +4 (c) +2 (d) zero

(ix) Out of the following which hybridization has maximum bond angle
(a) sp^2 (b) sp (c) sp^3 (d) dsp^2

(x) Which of the following compound contains aldehyde as functional group?
(a) CH_3COOH (b) CH_3CONH_2 (c) CH_3CHO (d) None of these

COMPREHENSION

In the modern periodic table, element are arranged in order of increasing atomic number which is related to the electronic configuration. Depending upon the type of orbitals receiving the last electron, the element in which periodic table have been divided into four blocks-s, p. d and f. the modern periodic table consists of 7 periods and 18 groups. Each period begins with the filling of a new energy shell. In accordance with the Aufbau principal, the 7 periods (1to 7) have 2, 8, 8, 18, 18, 32 and 32 elements respectively. The seventh period is still incomplete. To avoid the periodic table being too long, the two series of f-block elements, called lanthanoids and actinoids are placed at the bottom of the main body of the periodic table.

xi) How many groups and periods are present in modern periodic table ?

xii) What is general electronic configuration of P- block elements.
xiii) Modern periodic table is divided in how many blocks? Name them.
xiv) Why lanthanoids and actinoids are placed at the bottom of the periodic table?
(xv) On what basis the elements in modern periodic table are arranged?

TRUE/FALSE

(xvi) C_nH_{2n} is general formula of alkanes.
(xvii) For a spontaneous process ΔG = +ve
(xviii) Oxidation number of Mn in $KMnO_4$ is +7
(xix) Electrophile is positively charged species.
(xx). A well stoppered thermos flask contain some ice cubes is an example of open system.

Q. **2** A commercially available sample of sulphuric acid is15% H_2SO_4 by weight. Calculate molarity.
OR Calculate the mole fraction of ethanol (C_2H_5OH) in water which contains 92% of ethanol by mass.

Q.**3** What is the difference between orbit and orbital?

Q4 The electronic configuration of valence shell of Cu is $3d^{10}4s^1$and not $3d^9 4s^2$ how is this configuration explained?

Q.**5** Ionization enthalpy increases along a period but why nitrogen have high ionization enthalpy than oxygen? Explain.

Q. **6** Derive the relationship between Cp and Cv.~~Write Lewis dot symbols for atoms of elements Mg, Na, B, C~~.

Q. **7** Give mathematical expression for first law of thermodynamics .

Q.**8** Define Hess law ,Why this law is called law of constant heat summation?.

Q.**9**. What do you mean by common ion effect?

Q.**10**. Write Lewis dot symbols for atoms of elements Mg, Na, B, C.

Q. **11**.For the reversible reaction. https://www.punjabboardonline.com
$N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$ at 500°C,find K_c if the value of K_p is1.44×10^{-5}. **OR**
Calculate the pH of 0.001M NaOH solution.

Q12.What is isomerism? Write chain isomers of $CH_3CH_2CH_2CH_2CH_2CH_2CH_3$**OR**
What are carbocation ,show order of reactivity of primary, secondary and tertiary carbocations.

Q13.What do you understand by peroxide effect.

Q14. Trans But-2-ene has higher melting point than cis But-2-ene. Explain.

Q.**15**.What is salt bridge? Write its functions. **OR**
Explain standard hydrogen electrode(SHE)with diagram.

Q16. Determine the empirical formula and molecular formula of a compound if percentage of carbon is 57.8% and hydrogen is 3.6% and rest is oxygen. the vapour density is 83.

Q17.Yellow light emitted from a sodium lamp has a wavelength of 580 nm. Calculate the frequency and wave number of this light . **OR**
Calculate the wavelength of an electron moving with a velocity of 2.05×10^7 ms^{-1}.

Q **18**. Give IUPAC Names of
i) CH_3- CH_2 -CH_2-COOH
ii) CH_3-CH_2-CH_2-CH_2-CHO
iii) CH_3–CH_2–CH_2–CH_2–$C(CH_3)_2$– CH_3

Q **19**. Balance the equation by oxidation number method (in acidic medium).

$MnO_4^- + Fe^{2+} \rightarrow Mn^{2+} + Fe^{3+}$

OR Give the difference between (a) Oxidation number and valency. (b) Electrolytic cell and Electrochemical cell.

Q **20**.Write short note on
(a) Wurtz reaction
(b) Kolbe's electrolysis reaction
(c) Ozonolysis of ethene
(d) Friedal craft's alkylation
(e) Reduction of ethyne

OR
(a)Why alkynes are acidic in nature ?explain.
(b) Write the mechanism of nitration of benzene

Q **21**.(a) Draw molecular orbital diagram of N_2 and write molecular configuration ,magnetic behaviour and bond order.
(b) Discuss the shape of SF_6 on the basis of hybridization.
OR
Discuss the shapes of the following compounds on the basis of VSEPR theory.
(a) XeF_4 (b) PCl_5 (c) BF_3 (d) CH_4 (e) H_2O