T COMMON HALF YEARLY EXAMINATION - 2025

Standard - 11

Reg.No. | | | | | | |

CHEMISTRY

Time Allowed:3.00 Hours *Maximum Marks:70*

PART-I

15×1=15

NOTE: i) Answer all the questions.
ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

1) The equivalent mass of Potassium permanganate in alkaline medium is _____.
$MnO_4^- + 2H_2O + 3e^{\ominus} \longrightarrow MnO_2 + 4OH^-$
a) 31.6 b) 52.7
c) 79 d) None of these

2) Given that $C_{(g)} + O_{2(g)} \longrightarrow CO_{2(g)}$ $\Delta H^\circ = -a$ KJ
$2CO_{(g)} + O_{2(g)} \longrightarrow 2CO_{2(g)}$ $\Delta H^\circ = -b$ kJ
Calculate the ΔH° for the reaction $C_{(g)} + \frac{1}{2} O_{2(g)} \longrightarrow CO_{(g)}$
a) $\frac{b+2a}{2}$ b) 2a – b c) $\frac{2a-b}{2}$ d) $\frac{b-2a}{2}$

3) Zeolite used to soften hardness of water is hydrated
a) Sodium aluminium silicate b) Calcium aluminium silicate
c) Zinc aluminium borate d) Lithium aluminium hydride

4) Which oxide is more acidic?
a) BeO b) MgO
c) CaO d) BaO

5) The ratio of de broglie wavelengths of a deutering atom to that of an α-particle, when the velocity of the former is five times greater than that of later, is
a) 4 b) 0.2 c) 2.5 d) 0.4

6) Assertion : Critical temperature of CO_2 is 304 k, it can be liquefied above 304 k.
Reason : For a given mass of gas, Volume is to directly proportional to pressure at constant temperature.
a) both assertion and reason are true and reason is the correct explanation of assertion.
b) both assertion and reason are true but reason is not the correct explanation of assertion.
c) assertion is true but reason is false.
d) both assertion and reason are false.

7) The name 'Blue John' is given to which of the following compounds?
a) CaH_2 b) CaF_2
c) $Ca_3(PO_4)_2$ d) CaO

8) Non-Zero dipole moment is shown by
a) CO_2 b) p-dichlorobenzene
c) carbontetrachloride d) water

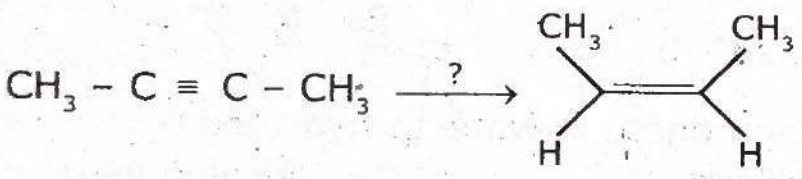
9) The solution which deviates positive or negative from Raoult's law
   a) Ideal solutions
   b) True solutions
   c) Non-ideal solutions
   d) Colloidal solutions

10) If x is the fraction of PCl_5 dissociated at equilibrium in the reaction $PCl_5 \rightleftharpoons PCl_3 + Cl_2$ then starting with 0.5 mole of PCl_5 the total number of moles of reactants and products at equilibrium is
   a) 0.5 – x
   b) x + 0.5
   c) 2x + 0.5
   d) x + 1

11) Sodium nitroprusside reacts with sulphide ion to give a purple colour due to the formation of
   a) $[Fe(CN)_5NO]^{3-}$
   b) $[Fe(CN)(NO)_5]^{+}$
   c) $[Fe(CN)_5NOS]^{4-}$
   d) $[Fe(CN)_5NOS]^{3-}$

12) Which one of the following represents Hyperconjugation?
   a) $\sigma - \sigma$
   b) $\sigma - \pi$
   c) $\pi - \pi^*$
   d) $\sigma - \sigma^*$

13) The catalyst used in the following reaction is



   a) Hg^{2+} / H^+, H_2O
   b) Na / liq.NH_3
   c) H_2, Pd / $CaCO_3$
   d) Zn / HCl

14) The most easily hydrolysed molecule under SN^1 condition is _____.
   a) Allyl chloride
   b) Ethyl chloride
   c) Isopropyl chloride
   d) Benzyl chloride

15) Match the List-I with List-II and select the correct answer using the code given below this.

List-I	List-II
A. Depletion of Ozone layer	1. CO_2
B. Acid rain	2. NO
C. Photo chemical smog	3. SO_2
D. Green house effect	4. CFC

   a) A-3, B-4, C-1, D-2
   b) A-2, B-1, C-4, D-3
   c) A-4, B-3, C-2, D-1
   d) A-2, B-4, C-1, D-3

PART-II

Note : Answer any six questions. Q.No:24 is compulsory: **6×2=12**

16) Define equivalent mass.
17) State Pauli's exclusion principle.
18) What is meant by Metallic hydrides? Give an example.
19) Define Hess's law of constant heat summation.

20) Write four colligative properties.

21) How will you convert chlorobenzene to benzene?

22) Explain positive Mesomeric effect with suitable examples.

23) What is Eutrophication?

24) At particular temperature $K_c = 4 \times 10^{-2}$ for the reaction.

$$H_2S_{(g)} \rightleftharpoons H_{2(g)} + \frac{1}{2}S_{2(g)}$$

Calculate Kc for each of the following reaction.

i) $2H_2S_{(g)} \rightleftharpoons 2H_{2(g)} + S_{2(g)}$

ii) $3H_2S_{(g)} \rightleftharpoons 3H_{2(g)} + \frac{3}{2}S_{2(g)}$.

Part-III

Note : Answer any six questions. Q.No:33 is compulsory: **6×3=18**

25) Briefly give the basis for pauling's scale of electrongativity.

26) Explain the correction term for volume in the Vander waal's equation.

27) Differentiate BOD and COD.

28) Describe Fajan's rule.

29) Write down the Born-Haber cycle for the formation of $CaCl_2$.

30) Explain Inductive effect with the suitable examples.

31) What is Reaction Quotient?

32) Suggest a simple chemical test to distinguish propane and propene.

33) A hydrocarbon C_3H_6 (A) reacts with HBr to form Compound (B). Compound (B) reacts with aqueous potassium hydroxide to give (C) of molecular formula C_3H_8O. What are (A), (B) and (C). Explain the reactions.

Part-IV

Note : Answer all the questions: **5×5=25**

34) a) i) Calculate the empirical and moleculer formula of a compound containing 76.6% carbon, 6.38% hydrogen and rest oxygen its vapour density is 47. (5m)

(OR)

b) ii) Explain briefly the time independent Schrodinger wave equation. (3m)

iii) State the trends in the variation of electronegativity in group and periods. (2m)

35) a) i) Give the uses of Hydrogen peroxide. (3m)

ii) Among NH_3, H_2O and HF in the order of increasing magnitude of hydrogen bonding and explain the basis for your arrangement. (2m)

(OR)

b) Deduce the Vant Hoff equation. (5m)

36) a) i) Discuss the formation of N_2 molecule using MO theory. (5m)

(OR)

b) ii) State Joule-Thomson effect. (2m)

iii) What are the advantages of using standard solutions? (3m)

37) a) i) Give the general characteristics of Organic Compounds. (3m)

ii) State the third law of thermodynamics. (2m)

(OR)

b) iii) Describe the mechanism of nitration of benzene. (3m)

iv) Complete the following: (2m)

a) $CH_3 - CH = CH_2 + HBr \xrightarrow{\text{Peroxide}}$

b) $CH_3CH_2Br + NaSH \xrightarrow[H_2O]{\text{Alcohol}}$

38) a) Starting from CH_3MgI, How will you prepare the following?

i) Acetone (1½)

ii) Isopropyl alcohol (1½)

iii) Acetic acid (2)

(OR)

b) How is acid rain formed? Explain its effect. (5m)

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