P.S.E.B. Sample Paper for 2025-26

Time : 3 Hours   **Class 12th**   **Subject- Chemistry**   **Max. Marks: 70**

Question 1 contains 20 parts of 1 mark each. Question 2 to 15 are of 2 marks each. Question 16 to 19 are of 3 marks each. Question 20 and 21 are of 5 marks each. All questions are compulsory.

Q1. **Choose the correct answer**

(i) An unripe mango placed in a concentrated salt solution to prepare pickle, shrivels because-

a. It gains water due to osmosis.
b. It loses water due to osmosis.
c. It gains water due to reverse osmosis.
d. It loses water due to reverse osmosis.

(ii) In comparison to a 0.01 M solution of glucose, the depression in freezing point of a 0.01 M $MgCl_2$ solution is?

a. The same   b. About twice   c. About three times   d. About six times

(iii) a-Isotonic solution have

a. same boiling point   b. same vapour Pressure

c. Same melting point   d. Same osmotic Pressure

(iv) What is the final oxidation state of manganese after the electrochemical reactions in a Dry Cell?

a. +4   b. +3   c. +2   d. +1

(v) If the unit of specific rate constant (k) for a certain gaseous reaction is atm^{-2} s^{-1}, then, the order of the reaction is-

a. Zero order   b. First order   c. Second order   d. Third order

(vi) The coordination number of platinum in $[PtCl_2(C_5H_5N)(NH_3)]$ is-

a. 3   b. 4   c. 5   d. 6

(vii) The reaction of toluene with Cl_2 in the presence of $FeCl_3$ gives predominantly-

    a. benzoyl chloride   b. benzyl chloride

    c. m-chlorotoluene   d. o- and p- chlorotoluene

(viii) Which of the following is most reactive towards nucleophilic addition reactions?

    a. CH_3COCH_3 b. CH_3CHO c. $CH_3COC_2H_5$ d. HCHO

(ix) Which of the following reagents cannot be used to distinguish between pentanal and 2-pentanone?

    a. Tollen's reagent   b. Fehling's solution

    c. Br_2 in CCl_4 d. I_2 in NaOH

(x) Which of these is most acidic?

a. CF_3COOH b. CCl_3COOH c. CBr_3COOH d. CH_3COOH

True/False

(xi) The compounds $[Co\ Cl_2\ (NH_3)_4]\ NO_2$ and $[Co\ Cl\ (NO_2)\ (NH_3)_4]\ Cl$ show coordination isomerism.

(xii) The crystal field splitting Δ_o, depends on the field produced by the ligand and charge on the metal ion.

(xiii) The boiling point of ethers are higher than those of isomeric alcohols.

(xiv) Benzaldehyde cannot undergo Cannizzaro reaction.

(xv) The red brown precipitate of Aldehydes with Fehling's solution is due to the formation of Cu_2O

Read the passage and answer the questions (xvi) to (xx)-
Carbohydrates are optically active polyhydroxy aldehydes and ketones or those compounds which on hydrolysis give such compounds are also carbohydrates. The carbohydrates which are not hydrolysed are called monosaccharides. Monosaccharides with aldehydic group are called Aldoses and those with free Ketonic group are called Ketoses. Carbohydrates are optically active. Number of optical isomers= 2^n , where n= number of asymmetric carbons. Carbohydrates are mainly synthesised by plants during photosynthesis. The monosaccharides

exist in the form of cyclic structures. In cyclization, the -OH group combines with the aldehydic or ketonic group. As a result, cyclic structures of five or six membered rings containing one oxygen are formed e.g. Glucose, Fructose, Galactose.

(xvi) What are carbohydrates?

(xvii) What are Aldoses?

(xviii) Define Monosaccharides.

(xix) Name a monosaccharide.

(xx) Glucose molecule has four asymmetric carbons. Find the total number of optical isomers in glucose.

2 Marks Questions

Q2. The boiling point of a solution containing 1.5g of dichlorobenzene in 100g of benzene was higher by 0.268 K. Calculate the molar mass ofdichlorobenzene. (K_b for benzene is 2.62 degree/molal)

ORCalculate the number of molecules of Oxallic acid ($H_2C_2O_4.2H_2O$)in 100 mL of 0.2 N oxalic acid solution.

Q3. Shazia removed the outer hard shells of two different eggs. She then placed one egg in pure water and the other egg in a saturated solution of sucrose. What change is she likely to observe in the eggs after few hours? Explain it.   (1+1)

Q4. Conductivity of a 0.00241 M acetic acid is 7.896 x 10^{-5} S cm^{-1}. Calculate its molar conductivity. If Λ^o for acetic acid is 390.5 S cm^2 mol^{-1}, what is its degree of dissociation (α)?   (1+1)

Q5. Write down the functions of a salt bridge in an electrochemical cell.

Q6. The rate constant of a reaction at 500 K and 700 K are 0.02 s^{-1} and 0.07 s^{-1} respectively. Calculate the value of E_a (Activation energy).

ORConsider the reaction: 4 NO_2 (g) + O_2 (g) → 2 N_2O_5 (g)

In an experiment, the rate of disappearance of O_2 is 0.24 mol L^{-1} s^{-1}. Calculate (i) the rate of disappearance of NO_2 and (ii) the rate of formation of N_2O_5.   (1+1)

Q7. Define: (i) Half life of a reaction (ii) Pseudo first order reaction   (1+1)

Q8. Transition metals form alloys with other transition metals. Explain why?

Q9. Write down the IUPAC names of-

(i)   Na [PtBrCl(ONO)(NH$_3$)]   (ii) [Ag(NH$_3$)$_2$] [Ag(CN)$_2$] (1+1)

Q10. (i) Define coordination number   (1)

(ii) What is the hybridisation and structure of [Ni(CN)$_4$]$^{2-}$ (1)

Q11. How will you convert phenol to salicylaldehyde?

ORExplain the mechanism of acidic dehydration of ethyl alcohol to form ethene.

Q12. Write down the following reactions-

(i) Aldol condensation   (ii) HVZ reaction   (1+1)

ORExplain why carboxylic acids exist as associated molecules?

Q13. Alkylamines are more basic than ammonia. Explain why?

Q14. Write down the following reactions-

(i)   Carbylamine reaction   (1)
(ii)   Reaction between benzene diazonium chloride and phenol in basic
        medium   (1)

Q15. Differentiate between fibrous and globular proteins.

3 Marks Questions

Q16. Three electrolytic cells A, B and C containing electrolytes of zinc sulphate, silver nitrate and copper sulphate respectively were connected in series. A steady current of 1.5 amp was passed through them until 1.45 g of silver were deposited at the cathode of cell B.

(i)   How long did the current flow?   (1)
(ii)   What weight of copper and zinc get deposited?   (2)

(Atomic masses of Zinc, Silver and Copper respectively are 65.3 g, 108 g and 63.5 g)

ORThe emf of the cell Zn (s) / Zn^{2+} (0.1 M) // Cd^{2+} (M$_1$) / Cd (s) has been found to be 0.3305 V at 298 K. Calculate the value of M$_1$. Given thatE^{o} Zn^{2+}/Zn = -0.76V and E^{o} Cd^{2+}/Cd = -0.40 V

Q17. Starting from 100 g of a radioactive substance, 2.5 g was left after 5 years. If its radioactive decay follows first order kinetics, calculate-

(i)   Rate constant for the decay of the radioactive substance   (1)

(ii)   The amount of substance left after one year   (1)

(iii)   The time required for half of the substance to decay.   (1)

Q18. Complete the following reactions:

(i) $CH_3OH + I_2 + NaOH \xrightarrow{\Delta}$ (1)

(ii) $CH_3CH_2OH \xrightarrow{Al_2O_3\ 523K}$ (1)

(iii) $C_2H_5ONa + C_2H_5Br \xrightarrow{\Delta}$ (1)

OR   What is Lucas reagent? Write down Lucas test for distinction between primary, secondary and tertiary alcohol.   (1+2)

Q19. (i) Lower aliphatic amines are soluble in water. Why?   (1)

(ii)   Write down a test to distinguish between aromatic primary amines from aliphatic primary amines.   (2)

5 Marks Questions

Q20. (i) Which Element of 3d transition series has lowest enthalpy of atomisation and why?   (1+1)

(ii) Transition elements or their compounds act as catalysts. Explain why. (3)

OR (i) Define Lanthanoid contraction.   (1)

(ii) Why do Ce and Tb show +4 oxidation state?   (2)

(iii)   Write down two similarities between Lanthanoids and Actinoids.   (2)

Q 21. (i) Write down the following reactions:-

a. Sandmeyer reaction
b. Hoffmann ammonolysis reaction
c. Wurtz Fittig reaction
d. Finkelstein Reaction
e. Friedel craft's Alkylation   (5)

OR   (i) Explain the mechanism of Substitution Nucleophilic bimolecular reactions of Haloalkanes with a suitable example.   (3)

(ii) Explain giving two reasons why Haloarenes are less reactive towards Nucleophilic substitution reactions than Haloalkanes.   (2)