

Class XII | Session 2026-27
Subject - Chemistry
Sample Question Paper - Set 9

General Instructions:

Read the following instructions carefully.

1. There are **33** questions in this question paper with internal choice.
2. SECTION A consists of 16 multiple-choice questions carrying 1 mark each.
3. SECTION B consists of 5 very short answer questions carrying 2 marks each.
4. SECTION C consists of 7 short answer questions carrying 3 marks each.
5. SECTION D consists of 2 case-based questions carrying 4 marks each.
6. SECTION E consists of 3 long answer questions carrying 5 marks each.
7. **All questions are compulsory.**
8. **Use of log tables and calculators is not allowed.**

Section A

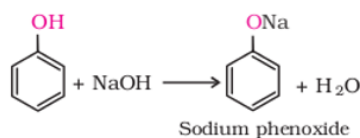
1. Which of the following is a disaccharide? [1]

- a) Glucose b) Starch
c) Cellulose d) Lactose

2. When diethyl ether is heated with excess of HI, it produces : [1]

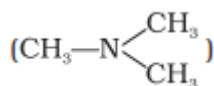
- a) ethyl iodide b) ethanol
c) iodoform d) methyl iodide

3. In the reaction [1]



- a) Cleavage of O - H bond b) Phenols are acidic in nature.
c) All of these d) They can donate a proton to a stronger base
4. Chloromethane on treatment with excess of ammonia yields mainly [1]

- a) N, N-Dimethylmethanamine b) N-methylmethanamine ($\text{CH}_3\text{—NH—CH}_3$)



- c) Methanamine (CH_3NH_2) d) Mixture containing all these in equal proportion

5. Which one among the following metals of 3d series has the lowest melting point? [1]

- a) Mn
c) Cu
- b) Fe
d) Zn

6. Match the item given in Column I with expression given in Column II. [1]

Column I	Column II
(a) Osmotic Pressure	(i) $p = K_H \cdot \chi_B$
(b) Relative lowering of vapour pressure	(ii) $\frac{\Delta P}{P_A^0} = \chi_B$
(c) Henry Law	(iii) $\Delta T_b = K_b \cdot m$
(d) Elevation in boiling point	(iv) $p = iCRT$

- a) (a) - (ii), (b) - (iii), (c) - (iv), (d) - (i). b) (a) - (iii), (b) - (i), (c) - (ii), (d) - (iv).
- c) (a) - (iv), (b) - (iii), (c) - (ii), (d) - (i). d) (a) - (iv), (b) - (ii), (c) - (i), (d) - (iii).

7. Which of the following does not give silver mirror test? [1]

- a) HCOOH b) $\text{CH}_3\text{CH}_2\text{CHO}$
c) CH_3COCH_3 d) CH_3CHO

8. The fragrance of the aldehyde and ketone are used for perfume and similar uses depend on: [1]

- a) moisture of the air.
- b) on its reactivity with other functional groups.
- c) only solubility of aldehydes and ketones.
- d) size and solubility of the aldehyde and ketone molecule.

9. For a certain reaction $R \longrightarrow \text{products}$, a plot of $\log [R]$ vs. time gives a straight line with a slope of 1.25 s^{-1} . The order of the reaction is: [1]

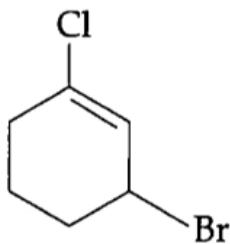
- a) Two b) One

c) Fractional d) Zero

10. Value of Henry's constant K_H : [1]

- a) increases with increase in temperature. b) increases with decrease in temperature.
c) remains constant. d) decreases with increase in temperature.

11. The IUPAC name of the compound shown below is: [1]



- a) 1-bromo-3-chlorocyclohexene b) 3-bromo-1-chlorocyclohexene
c) 2-bromo-6-chlorocyclohex-1-ene d) 6-bromo-2-chlorocyclohexene

12. Gabriel synthesis is used for the preparation of: [1]

13. **Assertion (A):** Vitamin A and D are not absorbed in the body unless fat digestion and absorption proceed normally. **[1]**

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

- Reason (R):** $I^{\ominus}$ is strong nucleophile so, it attacks from less hindered side.

- a) Both A and R are true and R is the correct explanation of A.
- b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.

- Reason (R):** Reaction involves the addition of Cn^- in rate determining step.

- a) Both A and R are true and R is the correct explanation of A.
- b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.

- Reason (R):** S_N2 reactions are always accompanied by inversion of configuration.

- a) Both A and R are true and R is the correct explanation of A.
- b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.

17. Why are Fe^{2+} compounds easily oxidised to Fe^{3+} as compared to Mn^{2+} compounds. [2]

18. **Answer the following:** [2]

- (a) a. Write the mathematical relation between rate constant and half-life of a first order reaction. [1]
b. What is collision frequency?

- (b) If the rate equation is given below: [1]

then what will be the unit of its rate and rate constant?

19. Calculate the temperature at which the solution containing 54 g of glucose, $C_6H_{12}O_6$ in 250 g of water will freeze. (K_b for water = $1.86\ K\ kg\ mol^{-1}$) **[2]**

Define the terms Mass percentage.

An organic compound 'A' (molecular formula C_3H_6O) is resistant to oxidation but forms a compound 'B' (C_3H_8O) on reduction. 'B' reacts with HBr to form a bromide 'C' which on treatment with alcoholic KOH forms an alkene 'D'.

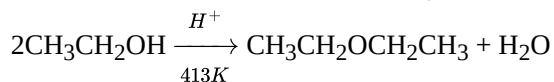
C_3H_6). Deduce the structures of A, B, C and D.

20. Write the formulae for the following coordination compounds: [2]

- Potassium tetrahydroxo sinate (II)
- Potassium trioxalatoaluminate (III)
- Dichloridobis cobalt III (ethane - 1, 2 diamine)

Section C

21. i. Write the mechanism of the following reaction: [3]



- Write the preparation of phenol from cumene.

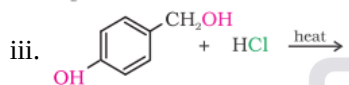
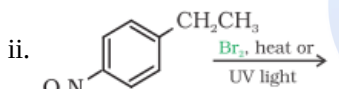
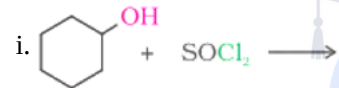
OR

Write the reactions and conditions for the following conversions:

- 2-Propanone into 2-methyl-2-Propanol
- n-Propyl alcohol into hexane

22. State Kohlrausch's law of independent migration of ions. How can the degree of dissociation of acetic acid in a solution be calculated from its molar conductivity data? [3]

23. Draw the structures of major monohalo products in each of the following reactions: [3]



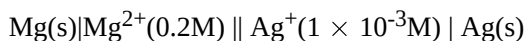
24. In a reaction between A and B, the initial rate of reaction was measured for different initial concentrations of A and B as given below: [3]

$A/mol\ L^{-1}$	0.20	0.20	0.40
$B/mol\ L^{-1}$	0.30	0.10	0.05
$r_0/mol\ L^{-1}\ s^{-1}$	5.07×10^{-5}	5.07×10^{-5}	1.43×10^{-4}

What is the order of the reaction with respect to A and B?

Powered by QualCrypt

25. Calculate the emf of the following cell: [3]



$$E^0(Ag^+/Ag) = 0.80V$$

$$E^0(Mg^{2+}/Mg) = -2.37V$$

26. What are fuel cells? Explain the electrode reactions involved in the working of $H_2 - O_2$ fuel cell. [3]

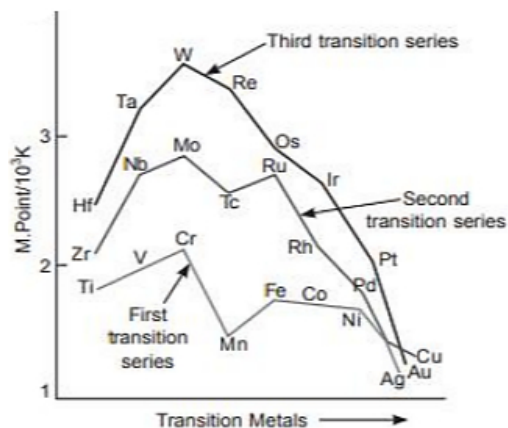
27. How would you bring about the following conversions? [3]

- Propanal to butanone
- Benzaldehyde to benzophenone
- Benzoyl chloride to benzonitrile

Section D

28. Read the following text carefully and answer the questions that follow: [4]

Observe the graph of transition metal and their melting points



- Why does W (tungsten) has highest melting point? (1)
- Which element in 3d series has lowest enthalpy of atomisation and why? (1)
- Why is mercury liquid? (2)

OR

Why are transition metals less electropositive than 's'-block elements? (2)

29. **Read the following text carefully and answer the questions that follow:**

[4]

A raw mango placed in concentrated salt solution loses water via osmosis and shrivel into pickle. Wilted flowers revive when placed in fresh water. A carrot that has become limp because of water loss into the atmosphere can be placed into the water making it firm once again. Water will move into its cells through osmosis. When placed in water containing less than 0.9% (mass/volume) salt, blood cells swell due to flow of water in them by osmosis.

- People taking a lot of salt or salty food suffer from puffiness or edema. What is the reason behind this?
- The preservation of meat by salting and of fruits by adding sugar protects against bacterial action. How?
- Why the direction of osmosis gets reversed if a pressure larger than the osmotic pressure is applied to the solution side? Write its one application.

OR

What care is generally taken during intravenous injections and why?

30. **Attempt any five of the following:**

[5]

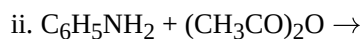
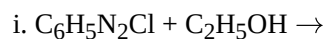
- Define native state in reference to proteins. [1]
- Define the following terms: [1]
 - Polysaccharides
 - Nucleotides
- Deficiency of which vitamin causes scurvy? [1]
- What happens when D-glucose is treated with the following? Give equations to support your answer. [1]
 - HI
 - HNO_3
- Name the disaccharide which on hydrolysis gives glucose and galactose. [1]
- Write the products obtained after hydrolysis of lactose. [1]
- Give the reaction of glucose with hydrogen cyanide. Presence of which group is confirmed by this reaction? [1]

31. a. Give plausible explanation for each of the following:

[5]

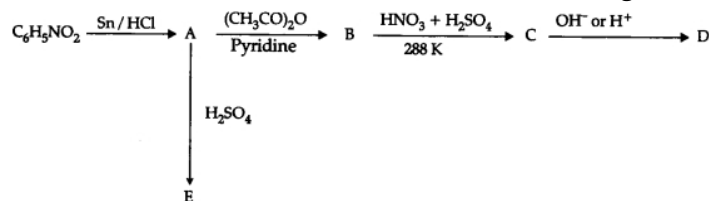
- i. Why are amines less acidic than alcohols of comparable molecular masses?
- ii. Why are primary amines highest boiling than tertiary amines?
- iii. Why are aliphatic amines stronger bases than aromatic amines?

b. Complete the following reactions:

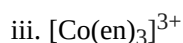


OR

Write the structure of A, B, C, D and E in the following reactions:



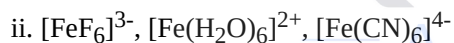
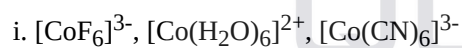
32. a. Write IUPAC name for each of the following complexes:



b. Draw one of the geometrical isomers of the complex $[\text{Pt}(\text{en})_2\text{Cl}]^{2+}$ which is optically inactive. Also write the name of this entity according to the IUPAC nomenclature.

OR

Using crystal field theory, draw energy level diagram, write the electronic configuration of the central metal atom/ion and determine the magnetic moment value in the following:



AI POWERED
LEARNING



CONCEPT
MASTERY



PERFORMANCE
FOCUSED



EXCELLENCE
DRIVEN

Powered by QualCrypt