DREAMERS EDU HUB
PRE-BOARD EXAMINATION PAPER 2025-26

CLASS 12th **CHEMISTRY** **20.12.2025**

Time Allowed: 3 Hours
Maximum Marks: 70
General Instructions
There are 33 questions in this question paper with internal choice.
SECTION A: 16 MCQs × 1 mark = 16 marks
SECTION B: 5 VSA × 2 marks = 10 marks
SECTION C: 7 SA × 3 marks = 21 marks
SECTION D: 2 Case-based questions × 4 marks = 8 marks
SECTION E: 3 LA × 5 marks = 15 marks
Use of calculators is NOT allowed.
All questions are compulsory.

SECTION A — Multiple Choice Questions(1 mark each)

1.Identify the IUPAC name of the following compound:
$CH_3–CH_2–CH(Br)–CH_3$
a) 3-Bromobutane b) 2-Bromobutane c) 1-Bromobutane d) 2-Methyl-2-bromopropane

2.Which compound gives a positive Tollen's test?
a) Propanone b) Benzaldehyde c) Cyclohexanone d) 2-Butanone

3.Which metal forms interstitial hydrides?
a) Na b) Ca c) Pd d) Al

4.Colligative property used for molar mass determination:
a) Surface tension b) Osmotic pressure c) Refractive index d) Viscosity

5.Which shows optical isomerism?
a) $[Co(NH_3)_6]^{3+}$ b) $[Cr(en)_3]^{3+}$ c) $[Ni(CN)_4]^{2-}$ d) $[CuCl_4]^{2-}$

6.Hydrolysis of lactose yields:
a) Glucose only b) Glucose & fructose c) Glucose & galactose d) Fructose only

7.Compound showing Cannizzaro reaction:
a) Acetone b) Benzaldehyde c) Propanal d) Butanone

8. Hinsberg reagent is
a) HCl + ZnCl2 b) Benzene sulphonyl Chloride c) AlCl3 d) $KMnO_4$

9.Reagent reducing nitrobenzene to aniline:
a) Sn/HCl b) H_2O_2 c) $KMnO_4$ d) $K_2Cr_2O_7$

10.Highest electrical conductivity:
a) Fe b) Cu c) Zn d) Ag

11.Van't Hoff factor for KCl (aqueous):
a) 1 b) 2 c) 3 d) 4

12.Geometry of $[Ni(CN)_4]^{2-}$:
a) Tetrahedral b) Square planar c) Octahedral d) Square pyramidal

13. Tollens test is used to detect:
a) Amines b) Aldehydes & Ketones c) Alcohols d) Acids

14.rate = $k[A]^2$ means reaction is:
a) Zero order b) 1st order c) 2nd order d) 3rd order

15.Assertion: HF has highest boiling point among HX
Reason: HF has H-bonding
a) Both true, R correct b) Both true, R incorrect c) A false, R true d) Both false

16.Assertion: Phenol is acidic
Reason: Phenoxide ion is resonance stabilized
a) Both true, R correct b) Both true, R incorrect c) A false, R true d) Both false

SECTION B — Very Short Answer(2 marks each)

17.Calculate molar mass of solute X if freezing point depression for 5 g of solute in 100 g water is same as 9 g of urea (M=60 g/mol).

18.What is lanthanoid contraction? State one consequence.

19. A first order reaction is 20 % completed in 40 mins , calculate time required for 60% completion ?

20.(a)Define pseudo first order reactions .
(b) Define molecularity.

21.Explain why tertiary alkyl halides undergo SN1 more readily than primary halides. Write the mechanism .

SECTION C — Short Answer(3 marks each)

22.A first-order reaction has $k = 4\times10^{-3}\ s^{-1}$.
Calculate:
a) t½ b) Change in rate if concentration doubled.

23.Explain:
(a) High enthalpy of atomisation in transition metals (b) $[Ni(CO)_4]$ forms easily but not $[Ni(NH_3)_6]^{3+}$

24.Identify A, B, C:
A: C_2H_6O → strong Oxidation → B
B + Na → C + $H_2\uparrow$

25.Convert:
(a) Chlorobenzene → Aniline (b) Benzyl chloride → Benzyl alcohol (c) Propanone → Propan-2-ol

26.Calculate emf of cell:
$Zn|Zn^{2+}$ (0.1M) || Cu^{2+} (1M)|Cu
$E°_{cell}$ = 1.10 V

27.Explain mechanism of dehydration of ethanol using conc. H_2SO_4.

28. State first law of thermodynamics . 0.02 Faraday electricity is passed through molten $AlCl_3$. Calculate mass of Al deposited.

SECTION D — Case Based Questions(4 marks each)

29.A chemistry teacher is demonstrating the behaviour of different transition-metal ions to a class. She prepares three solutions containing **Ti^{4+}**, **Mn^{2+}**, and **Zn^{2+}** ions. The students notice that the Ti^{4+} solution is colourless, Mn^{2+} shows magnetic behaviour, and Zn^{2+} always appears in the +2 oxidation state in textbooks and laboratory experiments. The teacher explains that these properties depend on the **electronic configurations** of the ions and the presence or absence of **unpaired d-electrons**.
Using the information given, answer the following questions:
a) Why Ti^{4+} is colourless? (1)
b) Why Mn^{2+} is paramagnetic? (1)
c) Why Zn^{2+} doesn't show variable oxidation states? (1)
d) Which element shows maximum oxidation states in 3d series .

30. A chemistry teacher is explaining colligative properties and gas solubility to her class. She begins by discussing how the number of particles formed in a solution affects properties like boiling point elevation and freezing point depression. She introduces the **van't Hoff factor (i)**, which tells students how many particles a solute produces upon dissociation.
Next, she dissolves **K_2SO_4** in water and explains that electrolytes may dissociate completely into ions, increasing the value of *i*. After that, she prepares a sodium hydroxide (NaOH) solution by dissolving **10 g NaOH in 250 mL of water** and asks the students to calculate its molarity. Finally, she explains how the solubility of gases in liquids is governed by **Henry's Law**.
Using the passage, answer the following questions:
a) Define van't Hoff factor. (1)
b) i for K_2SO_4 if fully dissociated. (1)
c) (i) Calculate Molarity of 10 g NaOH IN 250ml solution . (2)
(ii) State Henry Law .

SECTION E — Long Answer(5 marks each)

31.(a) Essential amino acids — define (1)
(b) Name two reducing sugars (1)
(c) Write the reaction of glucose with HI ? (1)
(d) Draw Cyclic structure of β-D-glucose and β-D fructose (2)

32.(a) (i) Draw geometrical isomers of $[Pt(NH_3)_2Cl_2]$. (1)
(ii) Write main postulates of collision theory . (2)
(b) Why $[Fe(CN)_6]^{4-}$ is low spin? Write the hybridisation of central metal atom in this compound. (2)

33.(a) Write Hoffmann bromamide reaction and Swarts reaction . (2)
(b) Distinguish primary vs secondary amines. write the reactions involved . (2)
(c) Test for primary , secondry and tertiary halides . (1)