Pragati Classes

Final Test

Date: 28 Nov 2026

Class XII · Chemistry

Duration: 180 Minutes

Max. Marks: 70

Section A — 1 Mark Questions

Q1. The product of the reaction of propanamide with Br_2 and NaOH is

(A) propanamine

(B) ethanamine

(C) propanenitrile

(D) propanoic acid

Q2. An SN2 reaction at a chiral carbon gives a product with

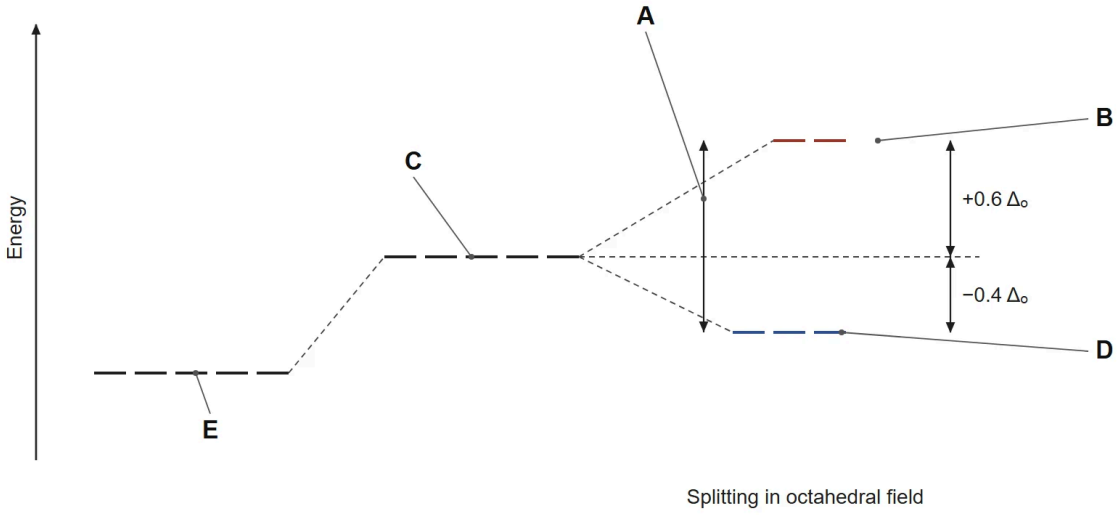
(A) racemisation

(B) no product

(C) retention

(D) inversion

Q3. In the diagram of the d orbital splitting in an octahedral crystal field given below, the part labelled **A** is



Splitting in octahedral field

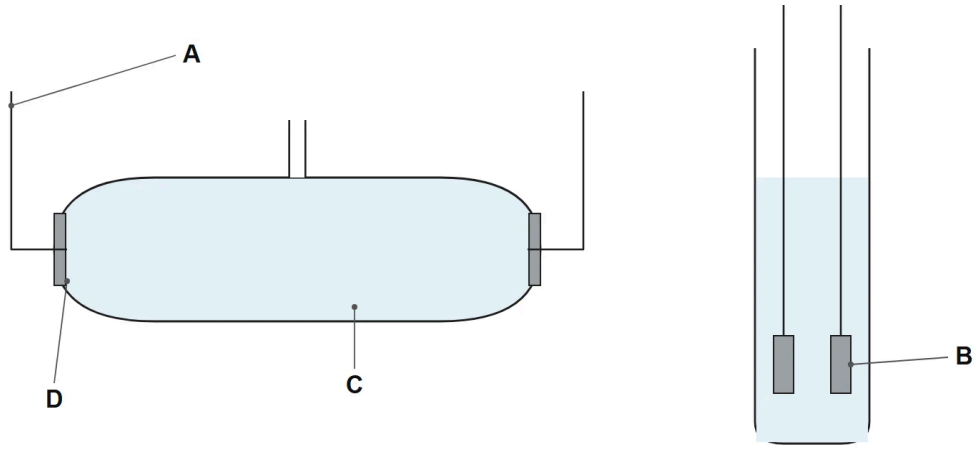
(A) Δ_o (crystal field splitting energy)

(B) eg ($dx^2–y^2$, dz^2)

(C) Average energy in spherical field (barycentre)

(D) t2g (dxy, dyz, dxz)

Q4. In the diagram of two types of conductivity cells given below, the part labelled **D** is



(A) Electrolyte solution
(B) Platinised Pt electrodes
(C) Connecting wires
(D) Platinised Pt electrode

Q5. Which nitrobenzoic acid is the strongest?

(A) o-nitrobenzoic acid
(B) m-nitrobenzoic acid
(C) p-nitrobenzoic acid
(D) benzoic acid

Q6. Oxidation of phenol with chromic acid gives

(A) benzoquinone
(B) benzoic acid
(C) catechol
(D) salicylic acid

Q7. Which pair shows positive deviation from Raoult's law?

(A) Phenol + aniline
(B) Chloroform + acetone
(C) Acetone + carbon disulphide
(D) Nitric acid + water

Q8. The test used to identify primary aromatic amines is

(A) iodoform test
(B) azo dye test (diazotisation then β-naphthol)
(C) Tollens' test
(D) Lucas test

Q9. The ion that is coloured in aqueous solution is

(A) Zn^{2+}
(B) Sc^{3+}
(C) Ti^{4+}
(D) V^{3+}

Q10. Glucose with Br_2 water and with HNO_3 gives respectively

(A) gluconic acid, saccharic acid
(B) saccharic acid, gluconic acid
(C) glucaric acid in both
(D) n-hexane, gluconic acid

Q11. Which of the following has a higher boiling point than ethanol (CH_3CH_2OH)?

(A) CH_3CHO
(B) C_3H_8
(C) CH_3OCH_3
(D) CH_3COOH

Q12. The oxidation state of Fe in $K_3[Fe(CN)_6]$ is

(A) +2 **(B)** +3

(C) +6 **(D)** −3

Q13. Assertion (A): Benzaldehyde does not give Fehling's test.

Reason (R): Aromatic aldehydes are weaker reducing agents than aliphatic aldehydes towards Fehling's solution.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is true but Reason (R) is false.

(D) Assertion (A) is false but Reason (R) is true.

Q14. Assertion (A): Chloroacetic acid is stronger than acetic acid.

Reason (R): Chlorine shows −I effect and stabilises the carboxylate ion.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is true but Reason (R) is false.

(D) Assertion (A) is false but Reason (R) is true.

Q15. Assertion (A): 3° alcohols are not oxidised easily.

Reason (R): They have no α-hydrogen.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is true but Reason (R) is false.

(D) Assertion (A) is false but Reason (R) is true.

Q16. Assertion (A): [CBSE 2020] Boiling points of alkyl halides decrease in the order R-I > R-Br > R-Cl > R-F.

Reason (R): Van der Waals forces decrease with increase in the size of halogen atom.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is true but Reason (R) is false.

(D) Assertion (A) is false but Reason (R) is true.

Section B — 2 Marks Questions

Q1. Explain how does the –OH group attached to a carbon of benzene ring activate it towards electrophilic substitution?

Q2. Write the equations for the reactions of ethanol with (i) Na (ii) CH_3COOH (conc. H_2SO_4).

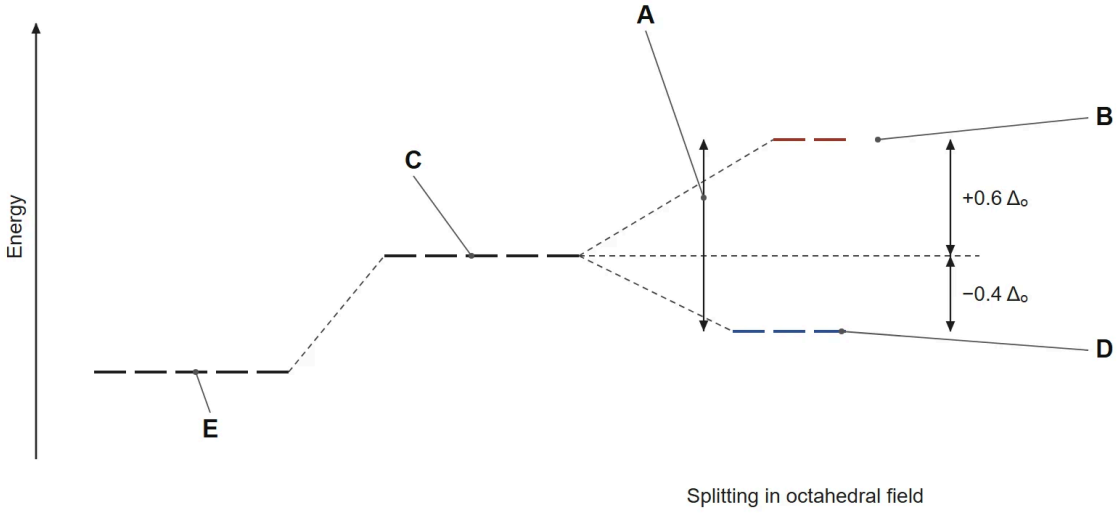
Q3. Name two diseases caused by hormonal imbalance.

Q4. What are ambident nucleophiles? Give two examples.

Q5. $[Fe(H_2O)_6]^{3+}$ is pale violet but its solutions often look yellow-brown. Suggest a reason.

Section C — 3 Marks Questions

Q1. Study the diagram of the d orbital splitting in an octahedral crystal field given below. Identify the parts labelled A, B, C, D and E.

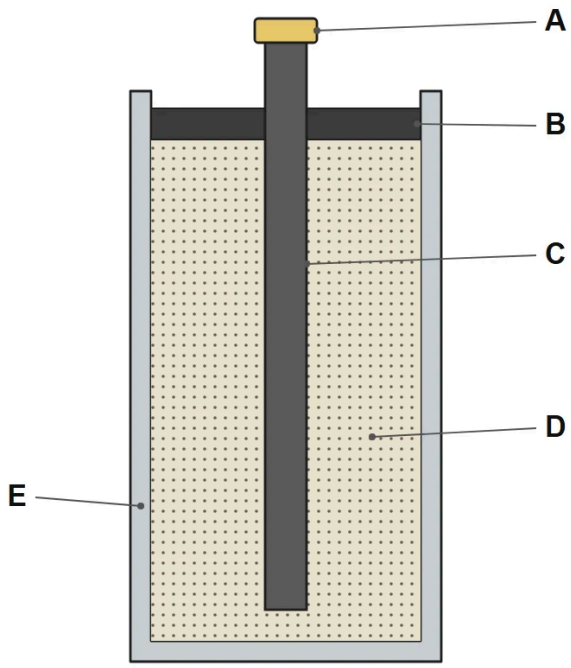


Q2. Write down the electronic configuration of: (i) Cr^{3+} (ii) Pm^{3+} (iii) Cu^{+} (iv) Ce^{4+} (v) Co^{2+} (vi) Lu^{2+} (vii) Mn^{2+} (viii) Th^{4+}.

Q3. Write the IUPAC names of (i) $[Co(NH_3)_6][Cr(CN)_6]$ (ii) $[Pt(NH_3)_4][PtCl_4]$ (iii) $Na[Ag(CN)_2]$.

Q4. How will you carry out the following conversions? (i) Ethanol to 3-hydroxybutanal (ii) Benzene to m-nitroacetophenone (iii) Ethylbenzene to benzoic acid.

Q5. Study the diagram of the commercial dry (Leclanché) cell given below. Identify the parts labelled A, B, C, D and E.



Q6. [CBSE 2022] A first order reaction takes 30 minutes for 75% decomposition. Calculate $t_{1/2}$. Given : [log 2 = 0.3, log 3 = 0.48, log 4 = 0.6, log 5 = 0.7]

Q7. A 0.1 m solution of a weak acid HA freezes at −0.205 °C. Find i and α (K_f = 1.86).

Section D — 4 Marks Questions

Q1. Vinegar. Vinegar contains 6–8% acetic acid, made by bacterial oxidation of ethanol. In the lab, a student titrates 10 mL of vinegar with 0.5 M NaOH and needs 12 mL. (CH_3COOH = 60 g mol^{-1})

(a) Write the reaction for the oxidation of ethanol to acetic acid.

(b) How can you show that vinegar is acidic using $NaHCO_3$?

(c) Calculate the mass of acetic acid in 100 mL of vinegar.

Q2. Testing for nickel. A chemist adds an alcoholic solution of dimethylglyoxime (dmgH, a bidentate ligand) to an ammoniacal solution of a nickel salt. A bright red precipitate of $[Ni(dmg)_2]$ forms. The complex is square planar and diamagnetic.

(a) What is the oxidation state of Ni in $[Ni(dmg)_2]$?

(b) What is the hybridisation of Ni?

(c) Why is the complex very stable, and why is it diamagnetic?

Section E — 5 Marks Questions

Q1. An organic compound A (C_7H_9N) is a primary aromatic amine whose amino group is not attached to the ring (it gives N_2 with HNO_2 at room temperature). Its isomer B gives a diazonium salt that couples with β-naphthol. Identify A and B, and write the reactions involved. Give one more isomer of B.

Q2. [CBSE 2016] (a) Write the chemical reaction involved in Etard reaction. (b) Arrange the following in the increasing order of their reactivity towards nucleophilic addition reaction : CH_3-CHO, $C_6H_5COCH_3$, HCHO (c) Why pK_a of $Cl-CH_2-COOH$ is lower than the pK_a of CH_3COOH ? (d) Write the product in the following reaction : $CH_3CH_2CH=CH-CH_2CN \xrightarrow[2.\ H_2O]{1.\ (i-Bu)_2AlH}$ (e) A and B are two functional isomers of compound C_3H_6O. On heating with NaOH and I_2, isomer A forms yellow precipitate of iodoform whereas isomer B does not form any precipitate. Write the formulae of A and B.

Q3. [CBSE 2026] An organic compound 'A', with molecular formula C_2H_6O reacts with active metals such as sodium to give compound 'B' and hydrogen gas. 'A' on treatment with iodine and sodium hydroxide gives 'C' and in presence of H_2SO_4 at 413 K gives 'D' ($C_4H_{10}O$). 'D' on reaction with excess of HI gives 'E'. Identify 'A', 'B', 'C', 'D' and 'E' and write all the reactions involved.

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