Class XII Chemistry — Practice Paper 1

Practice paper in the CBSE section pattern · Time: 1 hour · Maximum marks: 30

General instructions
1. This is an original practice paper, shorter than a board paper. It is not an official CBSE sample paper; official sample papers are published at cbseacademic.nic.in.
2. All questions are compulsory. Marks are shown in brackets.
3. Section A has 1-mark questions, Section B 2-mark, Section C 3-mark, Section D a 5-mark question and Section E a case-based question.
4. Write neatly, show your working and check your answers in the last five minutes.

Section A (6 marks)

Multiple choice and assertion–reason. 1 mark each.

1. The unit of the rate constant of a first-order reaction is: [1]
   (a) mol L^{-1} s^{-1}
   (b) s^{-1}
   (c) L mol^{-1} s^{-1}
   (d) no unit

2. Which is a colligative property? [1]
   (a) density
   (b) viscosity
   (c) osmotic pressure
   (d) colour

3. Lanthanoid contraction is caused by: [1]
   (a) poor shielding by 4f electrons
   (b) high ionisation energy
   (c) small nuclear charge
   (d) d-electrons

4. The IUPAC name of CH_3COCH_3 is: [1]

5. Which gives a positive iodoform test? [1]
   (a) methanol
   (b) ethanol
   (c) propan-1-ol
   (d) benzyl alcohol

6. Assertion (A): Phenol is more acidic than ethanol. [1]
   Reason (R): The phenoxide ion is stabilised by resonance.
   (a) Both true, R explains A
   (b) Both true, R does not explain A
   (c) A true, R false
   (d) A false, R true

Section B (6 marks)

Very short answers. 2 marks each.

7. 9 g of glucose (M = 180 g mol^{-1}) is dissolved in 250 g of water. Find the molality. [2]

8. A first-order reaction has k = 0.0693 min^{-1}. Find its half-life. [2]

9. Give two reasons why transition metals and their compounds are good catalysts. [2]

Section C (9 marks)

Short answers. 3 marks each.

10. For Zn | Zn^{2+}(1 M) || Cu^{2+}(1 M) | Cu, $E°(Zn^{2+}/Zn) = -0.76$ V and $E°(Cu^{2+}/Cu) = +0.34$ V. Find $E°_{cell}$ and $\Delta G°$, and say whether the reaction is spontaneous. [3]

11. Give three differences between SN1 and SN2 reactions. [3]

12. For $[Ni(CN)_4]^{2-}$, give the hybridisation, shape and magnetic behaviour. [3]

Section D (5 marks)

Long answer. 5 marks.

13. (a) Write the aldol condensation of ethanal. [5]
(b) Write the Cannizzaro reaction of methanal.
(c) Give a test to tell ethanal from propanone.
(d) What does Clemmensen reduction of propanone give?
(e) Why are aldehydes generally more reactive than ketones in nucleophilic addition?

Section E (4 marks)

Case-based question. 4 marks.

14. Glucose is the main fuel of the body. [4]
(i) Glucose heated for a long time with HI gives n-hexane. What does this show? (1)
(ii) Why is glucose called a reducing sugar? (1)
(iii) What is a peptide bond? (1)
(iv) Name one water-soluble vitamin. (1)

Answer key and marking guide

Award marks for each correct step shown in brackets. Accept any correct method or equivalent wording; value points are a guide, not a script.

Section A

Q	Answer	Marking
1	(b) s^{-1}	1 mark for the correct answer.
2	(c) osmotic pressure	1 mark for the correct answer.
3	(a)	1 mark for the correct answer.
4	propan-2-one (propanone)	1 mark for the correct answer.
5	(b) ethanol	1 mark for the correct answer.
6	(a)	1 mark for the correct answer.

Section B

Q	Answer	Marking
7	0.2 mol kg^{-1}	Moles = 0.05 (1); 0.05/0.25 = 0.2 m (1).
8	10 min	$t_{½}$ = 0.693/k (1); 10 min (1).
9	Variable oxidation states; ability to form complexes / provide a surface for adsorption	1 mark each.

Section C

Q	Answer	Marking
10	1.10 V; $\Delta G^\circ \approx -212.3$ kJ mol^{-1}; spontaneous	E°cell (1); $\Delta G^\circ = -nFE^\circ$ (1); conclusion (1).
11	Two steps via carbocation / one step; first / second order; racemisation / inversion; favoured by 3° / 1° halides	Any three, 1 mark each.
12	dsp^2; square planar; diamagnetic	1 mark each.

Section D

Q	Answer	Marking
13	(a) $2CH_3CHO \rightarrow CH_3CH(OH)CH_2CHO$ (dil. NaOH), then but-2-enal on heating (b) $2HCHO$ + conc. NaOH $\rightarrow CH_3OH$ + HCOONa (c) Tollens' test: ethanal gives a silver mirror (d) propane (e) Less steric hindrance and less electron release to the carbonyl carbon	1 mark each.

Section E

Q	Answer	Marking
14	(i) Six carbons in a straight chain (ii) It reduces Tollens' / Fehling's reagent (free aldehyde group) (iii) The –CO–NH– link between two amino acids (iv) Vitamin C or any B vitamin	1 mark each.

Marking guide in brief

- Step marks: a correct method with a slip in arithmetic keeps most of the marks.
- Units, labels and a final statement are part of the answer.
- In long answers, marks go to the points made, not the length.
- Time check: about 1 minute per mark leaves time to revise.