CBSE EXAMINATION PAPER-2024

CHEMISTRY

(Solved)

Time allowed : 3 hours | Maximum Marks : 12

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **16 questions.** All questions are **compulsory.**

ii. This question paper is divided into **3 sections.**

iii. **Section A** – questions number **1 to 12** are multiple choice questions Each question carries **1 marks.**

iv. **Section B** – questions number **13 to 13** are very short answer Each question carries **2 marks.**

v. **Section C** – questions number **14 to 16** are case based questions

vi. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.

vii. Use of calculator is NOT allowed.

Section A

Question 1.

Which of the following acids represents Vitamin C?

[1 Marks]

(A) Benzoic acid

(B) Saccharic acid

(C) Gluconic acid

(D) Ascorbic acid

Question 2.

Rosenmund reduction is used for the preparation of Aldehydes. The catalyst used in this reaction is.

[1 Marks]

(A) Iron (II) oxide

(B) Pd-$BaSO_4$

(C) $HgSO_4$

(D) Anhydrous $AlCl_3$

Question 3.

Which alkyl halide from the given options will undergo SN1 reaction faster?

[1 Marks]

(A) $(CH_3)_3C$-Br

(B) CH_3-CH_2-Br

(C) $(CH_3)_2CH$-Br

(D) $(CH_3)_3C$-CH_2-Br

Question 4.

From the elements of 3d series given below, which element shows the maximum number of oxidation states?

[1 Marks]

(A) Manganese

(B) Titanium

(C) Scandium

(D) Chromium

Question 5.

Identify the tertiary amine from the following:

[1 Marks]

(A) $CH_3–NH–CH_2–CH_3$

(B) $CH_3–CH(NH_2)–CH_3$

(C) $(C_2H_5)_2CHNH_2$

(D) $CH_3–N(CH_3)–CH_3$

Question 6.

Nucleophilic addition of Grignard reagent to ketones followed by hydrolysis with dilute acids forms

[1 Marks]

(A) Tertiary alcohol

(B) Alkene

(C) Primary alcohol

(D) Secondary alcohol

Question 7.

In a given graph of zero order reaction, the slope and intercept are:

[1 Marks]

(A) Slope = k, Intercept = $[R]_0$

(B) Slope = k/2.303, Intercept = $\ln[R]_0$

(C) Slope = -k/2.303, Intercept = n

(D) Slope = -k, Intercept = $[R]_0$

Question 8.

Assertion (A): p-nitrophenol is less acidic than phenol. Reason

(R): Nitro group is electron withdrawing and helps in the stabilization of p-nitrophenoxide ion.

[1 Marks]

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

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

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

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

Question 9.

Assertion (A): Benzoic acid does not undergo Friedel–Crafts reaction. Reason

(R): Carboxyl group is deactivating and the catalyst aluminium chloride gets bonded to the carboxyl group.

[1 Marks]

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

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

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

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

Question 10.

Assertion (A): Fructose is a reducing sugar.

Reason (R): Fructose does not reduce Fehling solution and Tollen's reagent.

[1 Marks]

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

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

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

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

Question 11.

The general electronic configuration of d-block elements is :

[1 Marks]

(A) $(n-1)d^{1-10}\ ns^{1-2}$

(B) $(n-1)d^{10}\ ns^{2\ -3}$

(C) $(n-1)\ d^{0}\ ns^{1-2}$

(D) $(n-1)d^{10}\ ns^{1-2}$

Question 12.

Consider the following reaction :

[-1 Marks]

(A) A- Methanol, B -Potassium formate

(B) A- Ethanol, B -Potassium formate

(C) A- Methanol, B -Potassium acetate

(D) A- Methanol, B -Potassium Ethanol

Section B

Question 13. 18 g of a non-volatile solute is dissolved in 200 g of H_2O that freezes at 272.07 K. Calculate the molecular mass of the solute (Kf for water = 1.86 K kg mol^{-1}).

[2 Marks]

Section C

Question 14. The nature of bonding, structure of the coordination compound can be explained to some extent by valence bond theory. The central metal atom/ion makes available a number of vacant orbitals equal to its coordination number. The appropriate atomic orbitals (s, p and d) of the metal hybridise to give a set of equivalent orbitals of definite geometry such as square planar, tetrahedral, octahedral and so on. A strong covalent bond is formed only when the orbitals overlap to the maximum extent. The d-orbitals involved in the hybridisation may be either inner d-orbitals i.e. (n-1)d or outer d-orbitals i.e. nd. The complexes formed are called inner orbital complex (low spin complex) and outer orbital complex (high spin complex) respectively. Further, the complexes can be paramagnetic or diamagnetic in nature. The drawbacks of this theory are that this involves number of assumptions and also does not explain the colour of the complex.

Question 15.

Question 16.

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Answer the following questions :