

CBSE EXAMINATION PAPER-2023

CHEMISTRY

(Solved)

Time allowed : 3 hours

Maximum Marks : 18

General Instructions :

Read the following instructions carefully and follow them :

- i. This question paper contains **18 questions**. All questions are **compulsory**.
- ii. This question paper is divided into **3 sections**.
- iii. **Section A** – questions number **1 to 16** are multiple choice questions Each question carries **1 marks**.
- iv. **Section B** – questions number **17 to 17** are very short answer Each question carries **2 marks**.
- v. **Section C** – questions number **18 to 18** 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 is not true about enantiomers?

[1 Marks]

- (A) They have the same specific rotation.
- (B) They have the same chemical reactivity.
- (C) They have the same density.

(D) They have the same melting or boiling point.

Question 2.

Aspirin is obtained by the acetylation of which of the following compounds?

[1 Marks]

(A) Salicylic acid

(B) Phenol

(C) Acetyl salicylic acid

(D) Salicylaldehyde

Question 3.

The reactivities of the carbonyl compounds HCHO (I), CH_3CHO (II) and CH_3COCH_3 (III) towards nucleophilic addition reaction decreases in the order:

[1 Marks]

(A) II > III > I

(B) I > III > II

(C) III > II > I

(D) I > II > III

Question 4.

On hydrolysis, which of the following carbohydrates gives only glucose?

[1 Marks]

(A) Lactose

(B) Sucrose

(C) Starch

(D) Fructose

Question 5.

Which of the following vitamins is water soluble?

[1 Marks]

- (A) Vitamin E
- (B) Vitamin A
- (C) Vitamin D
- (D) Vitamin C

Question 6.

The unit of the rate of reaction is the same as that of the rate constant for a:

[1 Marks]

- (A) first order reaction
- (B) it cannot be same
- (C) zero order reaction
- (D) second order reaction

Question 7.

Kohlrausch gave the following relation for strong electrolyte:

$\Lambda = \Lambda_0 - A\sqrt{C}$ Which of the following equality holds true?

[1 Marks]

- (A) $\Lambda = \Lambda_0$ as $C \rightarrow 1$
- (B) $\Lambda = \Lambda_0$ as $C \rightarrow 0$
- (C) $\Lambda = \Lambda_0$ as $C \rightarrow \infty$
- (D) $\Lambda = \Lambda_0$ as $C \rightarrow \sqrt{A}$

Question 8.

An azeotropic mixture of two liquids has a boiling point higher than either of the two liquids when it:

[1 Marks]

- (A) obeys Raoult's law.
- (B) shows large positive deviation from Raoult's law.

(C) shows no deviation from Raoult's law.

(D) shows large negative deviation from Raoult's law.

Question 9.

Which of the following colligative property is used to find the molar mass of proteins?

[1 Marks]

(A) Depression in freezing point

(B) Relative lowering of vapour pressure

(C) Elevation in boiling point

(D) Osmotic pressure

Question 10.

Among the following outermost configurations of transition metals which one shows the highest oxidation state?

[1 Marks]

(A) $3d^54s^2$

(B) $3d^34s^2$

(C) $3d^54s^1$

(D) $3d^64s^2$

Question 11.

How many ions are produced in the solution from the complex $[\text{Ni}(\text{NH}_3)_6]\text{Cl}_2$?

[1 Marks]

(A) 5

(B) 3

(C) 2

(D) 4

Question 12.

Which of the following species is not expected to be a ligand?

[1 Marks]

(A) NH_3

(B) NH_4^+

(C) CO

(D) H_2O

Question 13.

Which of the following is the most stable complex species?

[1 Marks]

(A) $[\text{Fe}(\text{C}_2\text{O}_4)_3]^{3-}$

(B) $[\text{Fe}(\text{CO})_5]$

(C) $[\text{Fe}(\text{CN})_6]^{3-}$

(D) $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$

Question 14.

Assertion (A) : Order and molecularity of a reaction are always same.

Reason (R) : Complex reactions involve a sequence of elementary reactions and the slowest step is rate determining.

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

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

Question 15.

Assertion (A) : Nucleophilic substitution of iodoethane is easier than chloroethane.

Reason (R): Bond energy of C Cl bond is less than C I bond.

[1 Marks]

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

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

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

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

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

Question 16.

Assertion (A): Zinc is not regarded as a transition element.

Reason (R): In zinc, 3d orbitals are completely filled in its ground state as well as in its oxidised state.

[1 Marks]

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

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

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

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

Section B

Question 17.

Define fuel cell and write its two advantages.

[2 Marks]

Section C

Question 18. The polarity of C–X bond of alkyl halides is responsible for their nucleophilic substitution, elimination and their reaction with metal atoms to form organometallic compounds. Alkyl halides are prepared by the free radical halogenation of alkanes, addition of halogen acids to alkenes, replacement of OH group of alcohols with halogens using phosphorus halides, thionyl chloride or halogen acids. Aryl halides are prepared by electrophilic substitution of arenes. Nucleophilic substitution reactions are categorised into SN1 and SN2 on the basis of their kinetic properties. Chirality has a profound role in understanding the SN1 and SN2 mechanism.

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