# QB365 Question Paper Software
# 12th Standard - Chemistry
# Electrochemistry Assertion and reason

Exam Time: 00:20 Hrs | Date: 2025-10-01

Total Marks: 10

## Questions:

1. In the following questions.an Assertion (A) is followed by a corresponding Reason (R) Use the following keys to choose the appropriate answer.
**Assertion (A)** Conductivity of pure water is $3.5 \times 10^{-5}$ $Sm^{-1}$.
**Reason (R)** High amounts of hydrogen and hydroxyl ions are present in water.
**Codes:**
(a) Both (A) and (R) are correct, (R) is the correct explanation of (A).
(b) Both (A) and (R) are correct, (R) is not the correct explanation of (A).
(c) (A) is correct; (R) is incorrect.
(d) (A) is incorrect; (R) is correct.

2. In the following questions.an Assertion (A) is followed by a corresponding Reason (R) Use the following keys to choose the appropriate answer.
**Assertion (A)** 96500 C charge is required for the reduction of one mole of silver ions.
**Reason (R)** The amount of electricity (or charge) required for oxidation or reduction depends on.
the stoichiometry of the electrode reaction.
**Codes:**
(a) Both (A) and (R) are correct, (R) is the correct explanation of (A).
(b) Both (A) and (R) are correct, (R) is not the correct explanation of (A).
(c) (A) is correct; (R) is incorrect.
(d) (A) is incorrect; (R) is correct.

3. In the following questions.an Assertion (A) is followed by a corresponding Reason (R) Use the following keys to choose the appropriate answer.
**Assertion (A)** $H_2$-$O_2$ fuel cell gives a constant voltage throughout its life.
**Reason (R)** In this fuel cell, $H_2$ reacts with OH ions yet the overall concentration of $OH^-$ ions does not change.
**Codes:**
(a) Both (A) and (R) are correct, (R) is the correct explanation of (A).
(b) Both (A) and (R) are correct, (R) is not the correct explanation of (A).
(c) (A) is correct; (R) is incorrect.
(d) (A) is incorrect; (R) is correct.

4. **Assertion :** The electrical resistance of any object decreases with increase in its length.
**Reason :** The electrical resistance of any object decreases with increase in its area of cross-section.
**Codes :**
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.

5. **Assertion :** Molar conductivity of a weak electrolyte at infinite dilution cannot be determined experimentally.
**Reason :** Kohlrausch law helps tofind the molar conductivity of a weak electrolyte at infinite dilution.
**Codes :**
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.

6. **Assertion :** If $\lambda^0_{Na^+}$ and $\lambda^0_{Cl^-}$ are molar limiting conductivities of the sodium and chloride ions respectively, then the limiting molar conductivity for sodium chloride is given by the equation, $\Lambda^\circ_{NaCl} = \lambda^\circ_{Na^+} + \lambda^\circ_{Cl^-}$
**Reason :** This is according to Kohlrausch law of independent migration of ions.
**Codes :**
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.

7. **Assertion :** KCI, NaCl and $NH_4CI$ cannot be used in the salt bridge of a cell containing silver.
**Reason :** A salt bridge contains concentrated solution of an inert electrolyte like KCl, $KNO_3$ , $K_2$ $SO_4$ or solidified solution of such an electrolyte in agar-agar and gelatine.
**Codes :**
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.

8. **Assertion :** If standard reduction potential for the reaction,
$Ag^+ + e^- \rightarrow Ag$ is 0.80 volt, then for the reaction
$2Ag^+ + 2e^- \rightarrow 2Ag$ it will be 1.60 volt.
**Reason :** If concentration of $Ag^+$ ions is doubled, the standard electrode potential remains same .
**Codes :**
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.

9. **Assertion :** At the end of electrolysis using platinum electrodes, an aqueous solution of copper sulphate turns colourless.
**Reason:** Copper in $CuSO_4$ is converted to $Cu(OH)_2$ during the electrolysis.
**Codes :**
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.

10. **Assertion:** $A_m$ for weak electrolytes shows a sharp increase when the electrolytic solution is diluted.
**Reason:** For weak electrolytes degree of dissociation increases with dilution of solution.
**codes :**
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.



## Answers Key:

1. (c) Pure water has small amounts of hydrogen and hydroxyl ions ($\sim 10^{-7}$ M)due to which it has very low conductivity ($3.5x\ 10^{-5}$ S $m^{-1}$ ). Thus, (A)is correct but (R) is incorrect.
2. (a) Both (A) and (R) are correct and (R) is the correct explanation of (A).
3. (a) Both (A) and (R) are correct and (R) is the correct explanation of (A).
4. (d) : The electrical resistance of any object is directly proportional to its length I, and inversely proportional to its area of cross-section, A. So, it increases with increase in length of object and decreases with increase in area of cross-section of object.
5. (b) : In the plot of molar conductivity versus concentration, the extrapolation to zero concentration is not possible.
6. (a) : According to Kohlrausch law, "limiting molar conductivity of an electrolyte can be represented as the sum of the individual contributions of the anion and cation of the electrolyte".
7. (b) : KCI, NaCI and $NH_4CI$ cannot be used as salt bridge in a cell containing silver as one of the electrodes because they react to form a precipitate of AgCl.
8. (d) : Standard reduction potential of an electrode has a fixed value
9. (c) : $Cu^{2+}$ ions are deposited as Cu.
10. (a) Assertion and reason both are correct statements and reason is correct explanation for assertion.