

**QB365 Question Paper Software**  
**12th Standard - Chemistry**  
**Solutions 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)** Polar solute dissolves in polar solvents and non-polar solute dissolves in non-polar solvents.

**Reason (R)** Like dissolves like.

- (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)** Experimentally determined molar mass is always higher than the true value.

**Reason (R)** Lower molar mass is due to dissociation of solute into ions.

- (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)** One molar aqueous solution has always higher concentration than one molal.

**Reason (R)** The molality of a solution depends upon the density of the solution whereas molarity does not.

- (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:** Sodium chloride used to clear snow on the roads.

**Reason:** Sodium chloride depresses the freezing point of water.

- (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. In the following question a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

**Assertion:** When methyl alcohol is added to water, boiling point of water increases.

**Reason:** When a volatile solute is added to a volatile solvent elevation in boiling point is observed.

**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 and reason both are incorrect statements.
- (e) Assertion is wrong statement but reason is correct statement.

6. **Assertion :** If one component of a solution obeys Raoult's law over a certain range of composition, the other component will not obey Henry's law in that range.

**Reason :** Raoult's law is a special case of Henry's law.

**Codes:**

- (a) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
- (b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
- (c) If the Assertion is correct but Reason is incorrect.
- (d) If both the Assertion and Reason are incorrect.

7. **Assertion:** Dilute solution of benzene and toluene is an ideal solution.

**Reason:** Benzene and toluene form H-bonding with each other.

**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:** The boiling point of 200 mL of 1 M urea solution is less than that of 200 mL of 2 M glucose solution.

**Reason:** Elevation of boiling point is directly proportional to the number of species present in the 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.

9. **Assertion:** Camphor is used as a solvent in the determination of molecular masses of naphthalene, anthracene, etc.

**Reason:** Camphor has high molal elevation constant.

**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:** Elevation in boiling point and depression in freezing point are colligative properties.

**Reason:** All colligative properties are used for the calculation of molecular masses.

**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.

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### Answers Key:

1. (a) Polar solute formed interaction with polar solvent and non-polar solute gives interaction with non-polar solvent. Hence, both (A) and (R) are correct and (R) is the correct explanation of (A).
2. (d) When there is dissociation of solute into ions, the experimentally determined molar mass is lower than the true value. Thus, (A) is incorrect but (R) is correct.
3. (b) Both (A) and (R) are true but (R) is not the correct explanation of (A). The correct explanation is that one molar aqueous solution has 1 mole in less than 1000 g of water. Hence, 1000 g of water will be associated with more than 1 mole while 1 molal has 1 mole in 1000 g of water
4. **(a):** According to colligative property, on addition of a non-volatile solute to a volatile solvent, the freezing point of solution decreases.
5. **(d)** Assertion and reason both are incorrect statements.
6. (b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
7. C) Assertion is correct statement but reason is wrong statement.  
**Explanation:**  
Benzene and toluene do not form H-bonding with each other.
8. A) Assertion and reason both are correct statements and reason is correct explanation for assertion.
9. C) Assertion is correct statement but reason is wrong statement.  
**Explanation:**  
Camphor has high molal depression constant.
10. C) Assertion is correct statement but reason is wrong statement.  
**Explanation:**  
Elevation in boiling point and depression in freezing point are colligative properties because they depend only on the number of solute particles in a solution irrespective of their nature. But all colligative properties are not used for mass determination for every substance, as some give very low precision, or require excessive heating or cooling.