QB365 Question Paper Software
12th Standard - Chemistry
Biomolecules 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) The coagulation of egg white occur on boiling.
Reason (R) Denaturation of protein is occur when its native form is subjected to physical change or chemical 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.

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) Vitamins A, D, E and K are stored in liver and adipose tissue.
Reason (R) Vitamins A, D, E and K are soluble in fats and oils.
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) When RNA is hydrolysed, there is no relationship among the quantities of different bases obtained.
Reason (R) RNA molecules are of three types and they perform different functions.
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. 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) Vitamins Band C must be supplied regularly in the diet.
Reason (R) Vitamins Band C are soluble in water which are readily excreted through urine and cannot be stored (except vitamin $B_{12)}$ in our body.
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.

5. **Assertion:** The specific rotation of a freshly prepared solution of a-glucose decreases from + 112° to 52.7° while that of β -glucose increases from + 19° to 52.7°.
Reason: The change in specific rotation of an optically active compound with time to an equilibrium value is called mutarotation.
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:** Glucose when treated with CH_3OH in presence of dry HCI gas gives a-and β -methyl glucosides.
Reason: Glucose reacts with phenyl hydrazine to form crystalline osazone.
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:** Glycine exists as zwitter ion but o - and p-aminobenzoic acids do not.
Reason: Due to the presence of $-NH_2$ and -COOH group within the same molecule, they neutralise each other and hence, α -amino acids exist as dipolar ions or zwitter 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.

8. **Assertion:** Insulin is water soluble.
Reason: Insulin is a globular protein.
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:** Uracil occurs in DNA.
Reason: DNA undergoes replication.
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:** D (+) - Glucose is dextrorotatory in nature .
Reason: 'D' represents its dextrorotatory nature.
Codes:
(a) Assertion and reason both are correct and reason is correct explanation of assertion.
(b) Assertion and reason both are wrong statements.
(c) Assertion is correct but reason is wrong statement.
(d) Assertion is wrong but reason is correct statement.
(e) Assertion and reason both are correct statements but reason is not correct explanation of assertion.

Answers Key:

1. (a) When a protein in its native form is subjected to physical change like change in temperature or chemical change like change in pH, the hydrogen bonds are disturbed. Due to this, globules unfold and helix get uncoiled and protein loses its biological activity. This is called denaturation of protein. The coagulation of egg white on boiling is the common example of denaturation. Thus, both (A)and (R)are correct explanation of (A).
2. (b) Some vitamins are soluble in fat and oils but insoluble in water. These are vitamins A, D,E and K. They are stored in liver and adipose (fat storing) tissues. Hence, Both (A) and (R) are correct but (R) is not the correct explanation of (A).
3. (b)When RNA is hydrolysed, there is no relationship among the quantities of four different bases obtained because in RNA,the bases don't occur in pairs as it is a single stranded strcuture. RNA molecules are of three types and they perform different functions. They are named as messenger RNA (m-RNA), ribosomal RNA (r-RNA) and transfer RNA (t-RNA). Thus, both A and R are correct but R is not the correct explanation of A.
4. (a) Vitamin B group and vitamin C are soluble in water so they are grouped together. Water soluble vitamins must be supplied regularly in diet because they are readily excreted through urine and cannot be stored (except vitamin B_{12}) in our body. Hence, Both (A) and (R) are correct and R is correct explanation of (A).
5. **(b):** Glucose exists in two forms, i.e. α -D-glucose with a specific rotation of + 112° and β -D-glucose with a specific rotation of + 19°. However, when either of these two forms is dissolved in water and allowed to stand, it gets converted into the same equilibrium mixture of both the α- and β -forms with a small amount of open chain form. As a result of this equilibrium, the specific rotation of a freshly prepared solution of α -glucose decreases from + 112° to 52.7° while that of β -glucose increases from +19° to 52.7°.
6. (b): Because of the ring structure C_1 in glucose becomes chiral and hence glucose exists in two stereoisomeric forms, i.e., α - and β -, corresponding to each stereoisomeric form glucose forms two methyl glucosides, i.e., α - and β -methyl glucosides.
7. (b): In o- or p-aminobenzoic acids, the lone pair of electrons on the $-NH_2$ group is donated towards the benzene ring. As a result, the basic character of $-NH_2$ group and acidic character of -COOH group decreases. Therefore, the weakly acidic -COOH group cannot transfer H^+ ion to the weakly basic $-NH_2$ group therefore, o and p-aminobenzoic acids do not exist as zwitter ion.
8. (b): Insulin is a globular protein. This protein has three-dimensional folded structure. These are stabilised by internal hydrogen bonding, hence, they are water soluble.
9. **(d):** Uracil occurs in RNA.

10. (c) Assertion is correct but reason is wrong statement. 'D' represents configuration, i.e., - OH group on right side on first chiral carbon from the bottom (+) dextrorotatory, it is also denoted by d(+),