

# CHEMISTRY STUDY MATERIALS FOR CLASS 12 (NCERT Based Questions - Answers)

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## Biomolecules

### SHORT ANSWER-II TYPE QUESTIONS (3 Marks)

Q. 1. (i) Deficiency of which vitamin causes scurvy?

(ii) What type of linkage is responsible for the formation of proteins?

(iii) Write the product formed when glucose is treated with HI.

Ans. (i) Vitamin C (ii) Peptide linkage (iii) n-hexane.

Q. 2. (i) Write the name of two monosaccharides obtained by hydrolysis of lactose?

(ii) Why vitamin C cannot be stored in our body?

(iii) What is the difference between nucleotide and nucleoside?

Ans. (i)  $\beta$ -D-glucose and  $\beta$ -D-galactose

(ii) Water soluble, excreted out of body.

(iii) In nucleotide, phosphoric acid/phosphate group attached to the nucleoside/  
nucleotide = base + sugar + phosphate group,

Nucleoside = base + sugar.

Q. 3. (i) Deficiency of which vitamin causes night blindness?

(ii) Name the base that is found in nucleotide of RNA only.

(iii) Glucose on reaction with HI gives n-hexane. What does it suggest about structure of glucose?

Ans. (i) Vitamin A (ii) Uracil.

(iii) This reaction suggests that all six carbon atoms in glucose are arranged in a straight chain.

Q. 4. Differentiate between the following:

(i) Secondary and tertiary structure of protein

(ii)  $\alpha$ -helix and  $\beta$ -pleated sheet structure of protein

(iii) Fibrous and globular protein

**Ans. (i) Secondary structure** is responsible for the shape of protein  $\alpha$ -helix and  $\beta$ -pleated sheets in which polypeptide chains have peptide bonds

**Tertiary structure** represents overall folding of polypeptide chain and give rise to the fibrous or globular molecular shape.

(ii)  **$\alpha$ -helix structure:** The peptide chains coiled up to form right handed helix involving H-bonding (Intramolecular).

**$\beta$ -pleated sheets:** The peptide chains lie side by side together by intermolecular hydrogen bonding.

(iii) **Globular protein**

**Fibrous protein**

(i) They form a  $\alpha$ -helix structure. (i) They have  $\beta$ -pleated structure.

(ii) They are water soluble. (ii) They are water insoluble

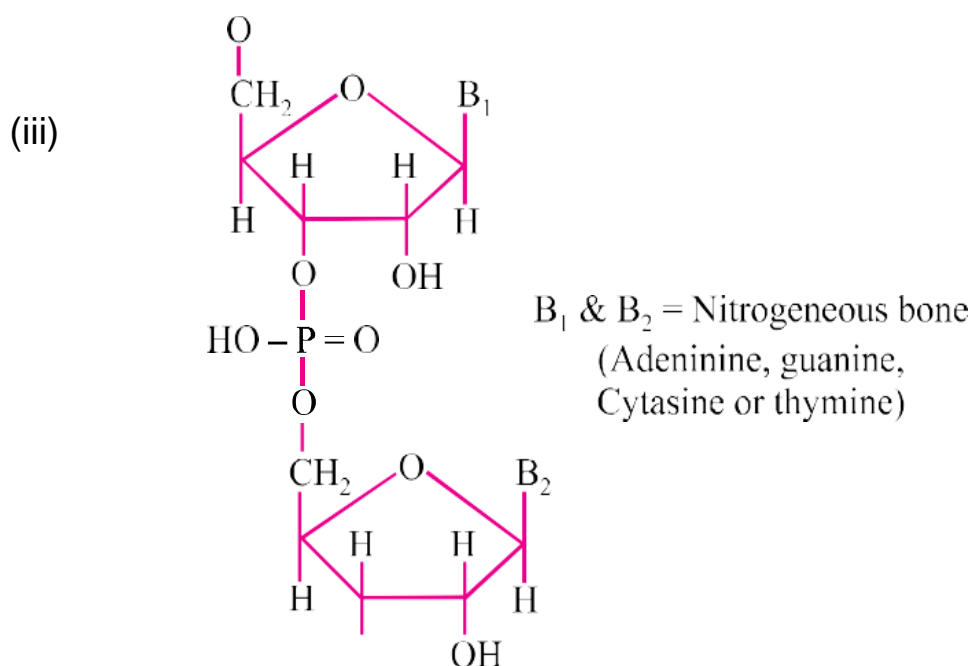
Q. 5. (i) **Name the four bases present in DNA.**

(ii) **Which of them is not present in RNA?**

(iii) **Give the structure of a nucleotide of DNA.**

**Ans. (i)** Adenine, Guanine, Thymine, Cytosine.

(ii) Thymine.



Q. 6. **Define with example:**

(i) **Isoelectric point** (ii) **Mutarotation** (iii) **Transcription**

**Ans. (i) Isoelectric point:** The pH at which there is no net migration of any ion towards electrode e.g., amino acids have Isoelectric point at pH = 5.5-6.3.

(ii) **Mutarotation:** It is spontaneous change in optical rotation when an optically active substance is dissolved in water e.g.,  $\alpha$ -glucose when dissolved in water changes its optical rotation from  $111^\circ$  to  $52.5^\circ$ .

(iii) **Transcription :** It is process by which m-RNA is generated from DNA e.g., if DNA has base sequence ATACA then m-RNA has base sequence UAUCGU

**Q. 7. Glucose or sucrose is soluble in water but cyclohexane and benzene are insoluble in water. Explain.**

**Ans.** Glucose contain 5 – OH groups and sucrose contain eight – OH groups, because of this they form intermolecular hydrogen bonding, so they are soluble in water. But benzene and cyclohexane doesn't contain – OH groups hence doesn't form intermolecular hydrogen bonding, so they are not soluble in water.

**Q. 8.(i) Fructose contains a keto group but still it reduces Tollen's reagent. Explain.**

(ii) **Give the chemical name and sources of :**

(a) **Vitamin C**                      (b) **Vitamin B<sub>1</sub>**

**Q.9.Name the components of starch, How do they differ from each other structurally?**

**Ans.** Amylose and Amylopectin

**Amylose** is long unbranched chain with  $\alpha$  -D-glucose units held by C1-C4 glycosidic linkage.

**Amylopectin** is branched chain polymer of  $\alpha$  -D-glucose formed by C1-C4 glycosidic linkage and branching occurs by C1-C6 glycosidic linkage.

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