



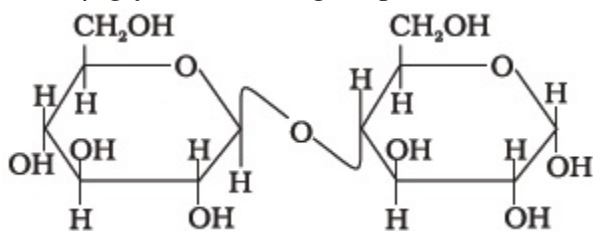
INDIAN SCHOOL AL WADI AL KABIR

<b>Class: XII</b>	<b>Department: SCIENCE 2020 -2021</b> <b>SUBJECT : CHEMISTRY</b>	<b>Date of submission:</b> <b>14.05.2020</b>
<b>Worksheet No: 03</b>	<b>Chapter: BIOMOLECULES</b>	<b>Note:</b> <b>A4 FILE FORMAT</b>
<b>NAME OF THE STUDENT</b>	<b>CLASS &amp; SEC:</b>	<b>ROLL NO.</b>

**PART 1 – CARBOHYDRATES**

1. Glucose on oxidation with  $\text{Br}_2(\text{aq})$  gives
  - a. Gluconic acid
  - b. Tartaric acid
  - c. Sachharic acid
  - d. Meso-oxalic acid
2. Which of the following is non-reducing sugar?
  - a. Glucose
  - b. Sucrose
  - c. Maltose
  - d. Lactose
3. Which of the following polymer is stored in the liver of animals?
  - a. Amylose
  - b. Cellulose
  - c. Amylopectin
  - d. Glycogen
4. *Assertion* : D (+) – Glucose is dextrorotatory in nature.  
*Reason* : ‘D’ represents its dextrorotatory nature.

5. Assertion :  $\beta$ -glycosidic linkage is present in maltose,



Reason : Maltose is composed of two glucose units in which C-1 of one glucose unit is linked to C-4 of another glucose unit.

1 Mark

**6. Name the reagents used to check the reducing nature of carbohydrates.**

7. Glucose pentaacetate does not react with hydroxylamine. Give reason.

8. Draw the Fischer projection of D(+) Glucose.

9. What are the products of hydrolysis of Lactose?

2 Marks

10. What happens when Glucose is treated with

- acetic anhydride
- HCN?

11. Describe the following with an example.

- Polysaccharides
- Reducing sugars

12. Write chemical reactions to show the presence of

- straight chain
- aldehyde functional group in Glucose.

13. a. What is inversion of cane sugar?

b. Which one of the following is an oligosaccharide?

Maltose, Starch, Fructose, Glucose

14. Define the terms.  
a. Invert sugar                      b. Glycosidic linkage

3 Marks

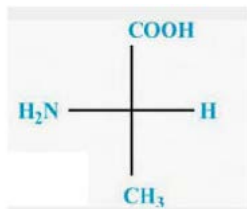
15. a. What are anomers? Give the structures of two anomers of Glucose.  
b. Give a chemical reaction to show the presence of a primary alcoholic group in Glucose.  
c. Draw the pyranose structure of  $\alpha$ -D-Glucose.
16. Mention three facts/reactions which cannot be explained by the open structure of Glucose.
17. a. Write two differences between the  $\alpha$  and  $\beta$  forms of Glucose.  
b. Which component of starch is a branched polymer of  $\alpha$ -D-Glucose and insoluble in water?  
c. What is essentially the difference between  $\alpha$ -form and  $\beta$ -form of fructose? Explain.

**PART 2 – PROTEIN, VITAMINS, MINERALS AND NUCLEI ACIDS**

**1. What are proteins?**

Ans. These are high molecular mass complex biomolecules of amino acids present in all living cells. Eg. Keratin, myosin, albumin, insulin

**2. What type of configuration is presented in this amino acid?**



ANS. L – configuration since –NH<sub>2</sub> group is present on the L.H.S

**3. What are neutral amino acids?**

These amino acids have equal number of amino and carboxyl groups  
Eg. Glycine and Alanine

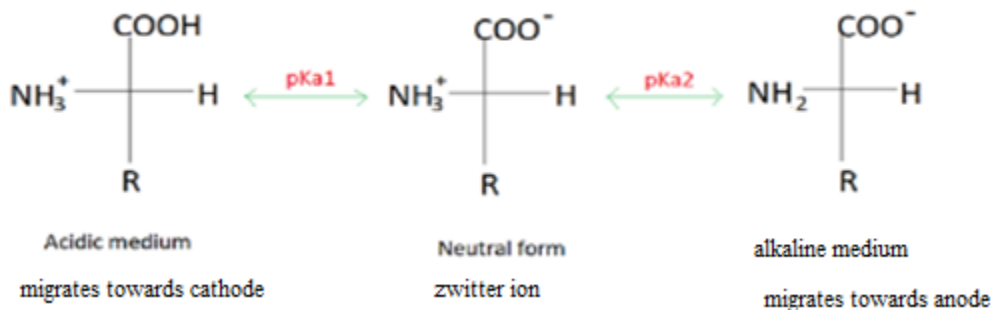
**4. Give one example each for:**

- Acidic amino acids – aspartic acid
- Neutral amino acids – Alanine
- Basic amino acids - lysine

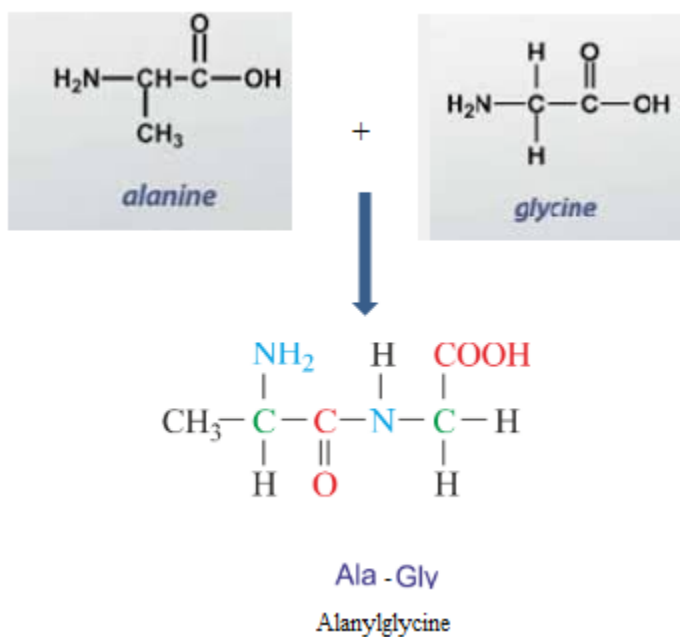
**5. What is isoelectric point of amino acids?**

In aqueous solutions, the amino acid has zwitter ion formation and would be neutral. In the presence of electric field, its behavior will depend upon the acidity or basicity of the solution.

In alkaline solution, the amino acid exists as a negative ion and migrates towards anode whereas in acidic solution, the amino acid exists as a positive ion and migrates towards cathode.



6. Show the formation of the peptide linkage between alanine and glycine



7. Identify the three amino acids found in tripeptide : Alanylglycyl phenylalanine

ANS. Alanine, Glycine and Phenylalanine

8. Convert the following in the three letter symbols

a. Gly-Ala-Phe      Ans. GAP

b. Phe- Ala – Gly      Ans. PAG

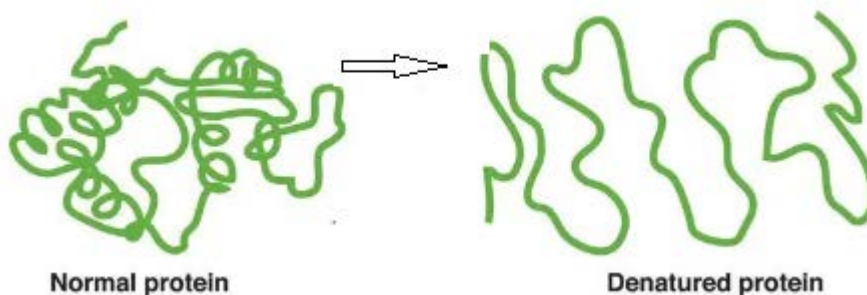
**9. Identify the type of proteins**

- a. Myosin   b. Albumin   c. Insulin   d. Keratin   e. Fibroin

Ans. Fibrous protein – myosin, keratin , fibroin

Globular protein – albumin , insulin

**10. Identify the type of process shown: Give two examples**



Ans. Denaturation; boiling of egg, curdling of milk

**11. Fill in the table with the appropriate bonding / linkages:**

Substances	Linkages - Answers
Amino acids	Peptide linkages
$\alpha$ Helix structure of protein	Intramolecular hydrogen bonding
$\beta$ pleated structure of protein	Intermolecular hydrogen bonding
Fibrous protein	Strong hydrogen bonding and disulphide bonds
Nucleotide	Phosphodiester linkages

**12. The melting points and solubility in water of amino acids are generally higher than that of corresponding haloacids. Explain.**

Hint:

- Formation of zwitter ion in aqueous solution.
- Dipolar structure

**13. Where does the water present in the egg go after boiling the egg?**

Hint: water present will involve in denaturation through H- bonding

**14. Why vitamin C cannot be stored in our body?**

Hint: water soluble ; readily excreted through urine in our body.

**15. What happens to the following on hydrolysis ?**

Substances	On hydrolysis - Answers
Nucleotide from DNA containing thymine	2-deoxy-D-ribose, thymine and phosphoric acid
Nucleoside	Sugar + base
Nucleotide	Sugar + base + phosphoric acid

DNA	Adenine, Guanine, Cytosine and uracil
RNA	Adenine, Guanine, Cytosine and Thymine

16.

What are the different types of RNA found in the cell?

Answer

- (i) Messenger RNA (m-RNA)
- (ii) Ribosomal RNA (r-RNA)
- (iii) Transfer RNA (t-RNA)

**BOARD QUESTIONS WITH ANSWERS:**

17. Name the unit formed by the attachment of a base to 1

ANS. Nucleotide ( 1 mark)

position of su

18. Name the species formed when an aqueous solution of amino acid is dissolved in water?

Ans. Zwitterion / dipolar ion  
( 1 mark)

19.

**Assertion:** The two strands in double strand helix structure of DNA are complementary to each other

**Reason:** Disulphide bonds are formed between specific pairs of bases

Ans. Assertion is correct, but reason is wrong statement. ( 1 mark)

20. Give the plausible( reasonable) explanation for the following :

**The two strands in DNA are not identical but are complimentary.**

**The two strands in DNA are not identical but** they held together because they form hydrogen bonds with each other. Cytosine forms a hydrogen bond with guanine and adenine forms a hydrogen bond with thymine. SO, that's why **the two strands** act as a **complementary** for each other.

*Prepared by Ms. Jasmin Joseph & Ms. Jenifer Robinson*

**CHECKED BY HOD - SCIENCE**