

Short Questions

(1)

Biochemistry

It is a hybrid Science. It deals with studying various biomolecules that occur in living cells and organisms and their chemical reactions.

Living organisms should be able to transfer matter and energy into different forms.

(2)

Functions of Carbohydrate

They are involved in building, repairing and maintaining body tissues.

They are necessary for nerve tissues and source of energy for brain.

They have fibres which prevent constipation and lower the risk of cancer, diabetes.

(3)

proteins are classified into three types.

i. Simple proteins
(albumins, globulins, glutelins, histone)

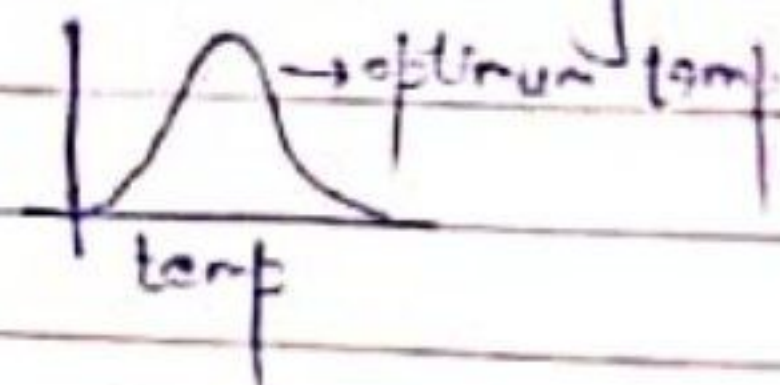
ii - compound protein (nucle./muc. proteins)
 derived protein (proteins, proteases, peptones and peptid

(4)

→ In range of $0-35^{\circ}\text{C}$ the rate of reaction is directly to the temp in animals

→ But when the temperature rises above to this limit the enzyme activity is disturbed as at this temp denaturation of enzymes may occur means that their globular structure is broken down due to high temp.

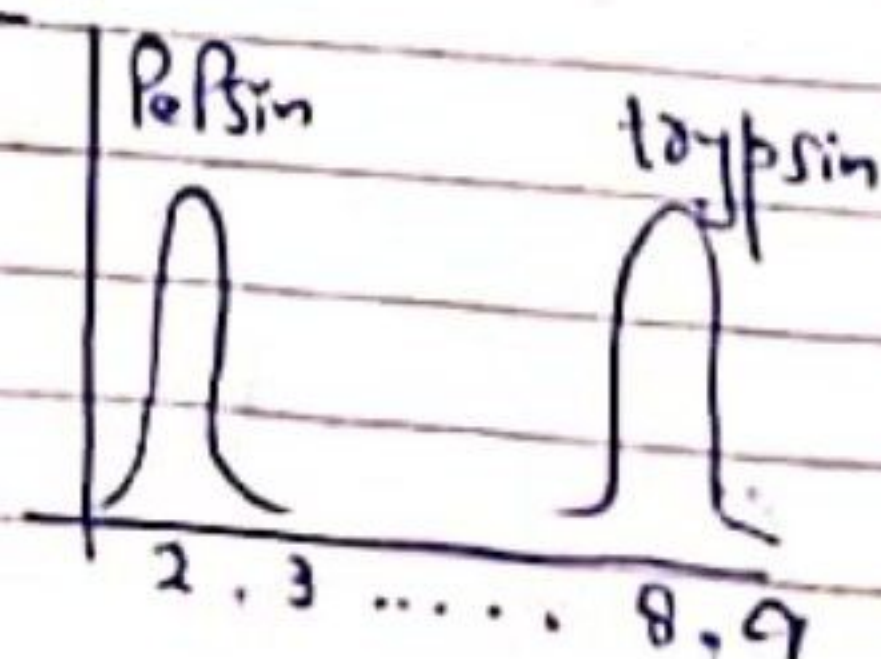
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All enzymes works at a narrow range of PH called optimum PH

3 PH for pepsin is 2
 PH for trypsin is 8-9

In these way enzymes work at a specific PH

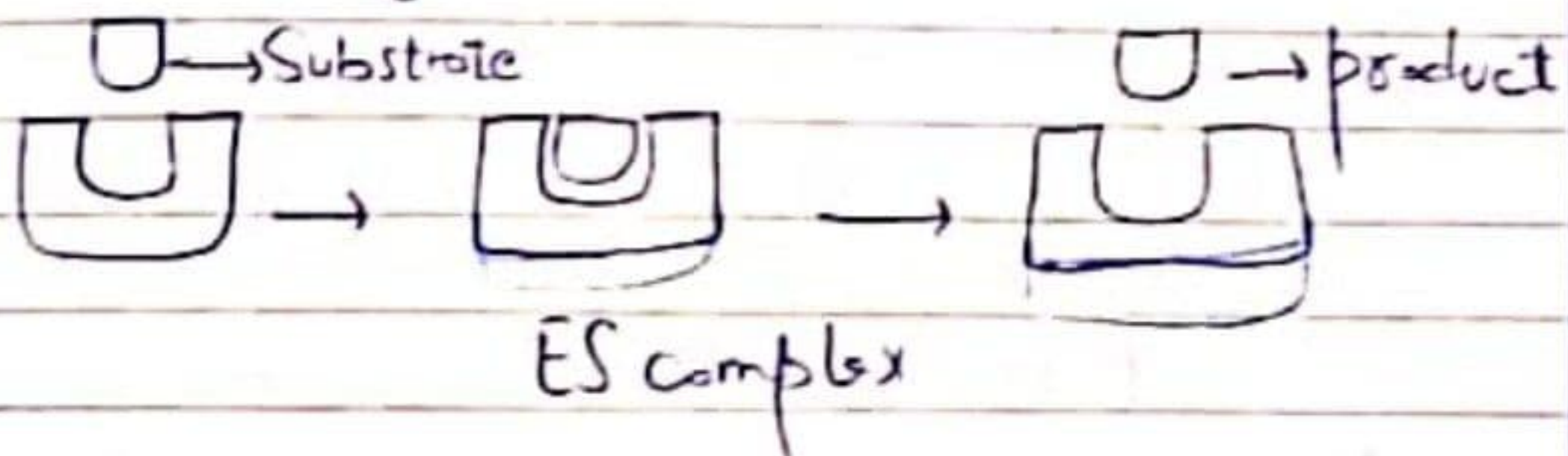


(6) Lock and Key model (Emil Fischer) (1894)

According to this model enzymes are very specific for their substrates.

One enzyme can catalyze only one substrate.

The active site of enzyme is rigid.
e.g. lock and key



(7)

The main use of enzymes in paper industry:
It breaks starch to minimize its viscosity that is used in making paper.

(8) Cofactor, Coenzyme

The non-protein part of enzyme is called cofactor. It is responsible for the proper functioning of enzyme. If the non-protein part

is loosely attached to the enzyme
it is called coenzyme.

(9) Properties of Lipids

The property which is common
in all lipids is hydrophobic.

The word 'hydro' means water
and 'phobic' means hating. They
are water hating.

due to this property they are
insoluble in water.

They prevent to form bond
with H_2 and being electrically charged.

Fat (10) Oil

They are
saturated.

They have single
bond between
all the carbon
atoms.

They are
unsaturated.

They have double
bond between a
specific carbon
atoms.

(10)

There are three main
structural components of DNA and
RNA.

- nitrogenous base
- phosphate group
- Pentose sugar
- DNA and RNA have little change in their nitrogenous bases at C-5
- DNA contain thymine while RNA have uracil instead of thymine and they both have guanine, adenine, cytosine.

(11) Importance of minerals

- 1- They are important because they maintain all physiological processes.
- 2- They act as catalysts.
- 3- They are responsible for the transmission of message.

(12)
different routes for the loss of zinc through human body are:

- 1- gastrointestinal tract
- 2- biliary and intestinal secretion
- 3- urine and surface losses

Quick Quiz

(1)

a) Carbohydrates

They are polyhydroxy aldehydes or ketones or converted to such substances on hydrolysis, oxidation and reduction.

Their formula is $C_n(H_2O)_n$.

b) The structural formula of glucose is $C_6H_{12}O_6$.

The structural formula of fructose is also $C_6H_{12}O_6$.

c) Glycemic index

The diet plan which is given to the sugar or diabetes patient is glycemic index.

It is different for different type of patients.

d) Carbohydrate contain 4kcal per gram.

e) bacteria in the mouth by over take of sugar cause production of acid which attacks the enamel of teeth. when carbohydrates are being taken too much they form tooth decay.

(2)

a) **Proteins**

The molecules which yield amino acid on hydrolysis are proteins.

Classes

Their classes are
Simple protein
Compound protein
derived protein

b)

primary Structure

The sequence of amino acids in a peptide chain is primary structure. $\text{H}-\text{O}-\text{O}-\text{O}-\text{O}$

Secondary

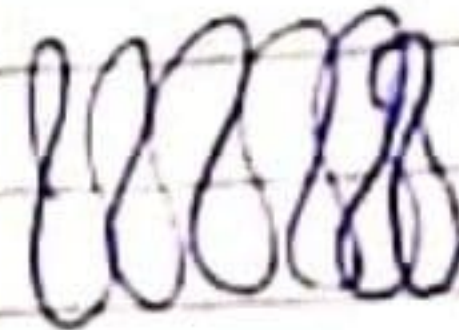
The primary structure goes into zig-zag manner forming



Secondary structure

Tertiary

Twisting or folding of polypeptide chain constitutes the tertiary structure



c) **polypeptides**

amino acid combined with each other by peptide bonds. peptides having molar mass up to 10,000 are polypeptides.

(3)

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a) **enzymes**

are proteins which speed up the reaction without being consumed.

They are called catalysts because they form catalyzation of their substrate.

b) Working of enzyme

Lock and Key Induced fit model

In this enzymes are very specific for their substrates.

active site is rigid.

Exp Urease

Enzymes are not specific for their substrate.

active site is flexible.

Exp - Carbonic anhydrase

c)

Enzymes are used in different industries like paper, dairy, starch, biofuel, rubber and photographic etc.

1- In paper industry enzymes break starch to lower its viscosity which aids in making paper.

2- In dairy lipase is used for making cheese.

(4)

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a)

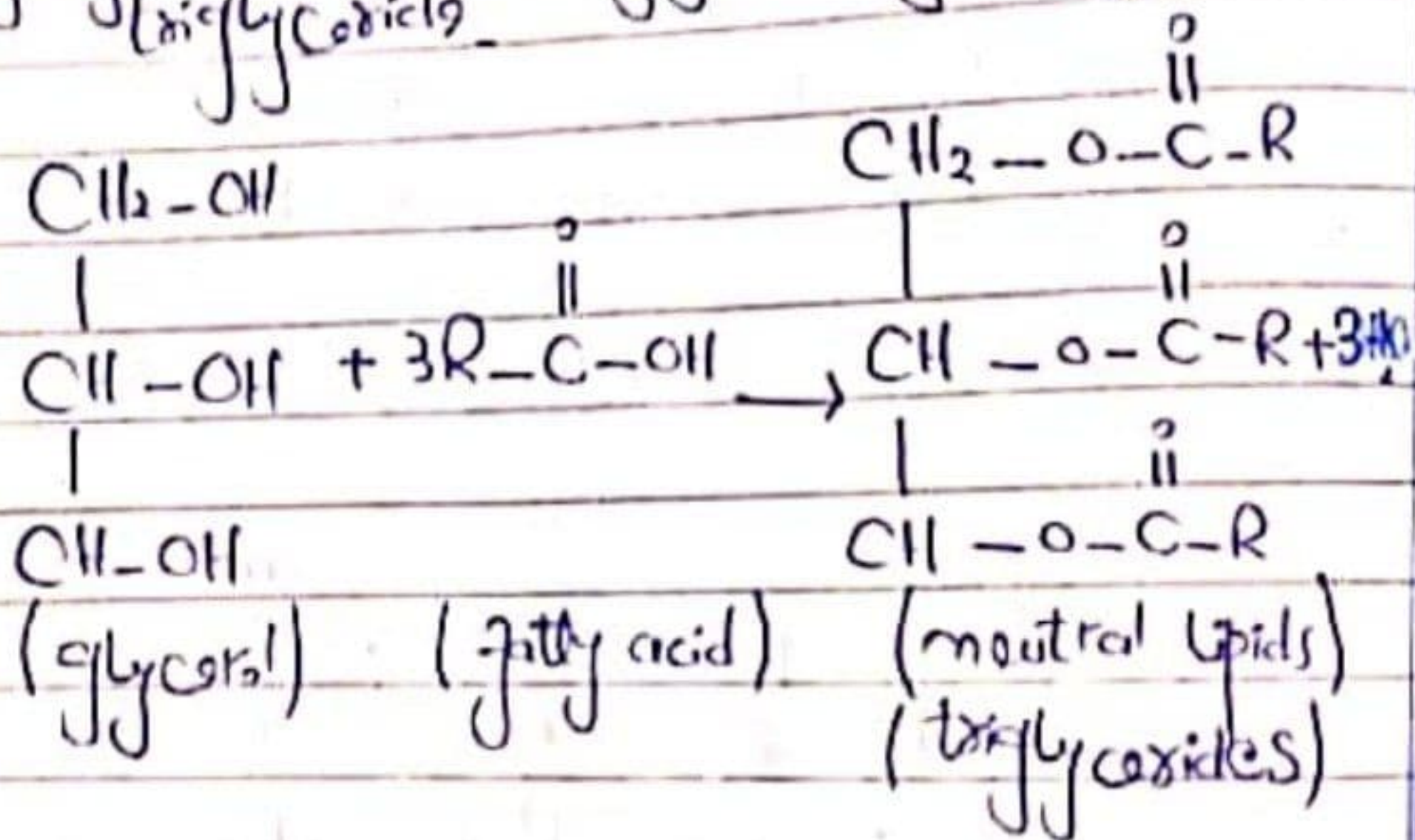
Lipids

They are esters of long chain fatty acid and alcohol.
All lipids are hydrophobic.

This is the common property present in all lipids.

b) Triglycerides

The hydrolysis of triglycerides forming fatty acid and glycerol.



(5)

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a) Structural Components DNA, RNA

There are three structural components

- deoxy sugar
- nitrogenous base
- phosphate group

Both DNA and RNA have adenine, guanine and cytosine but DNA contain thymine and RNA

contain Uracil.

b) Transcription

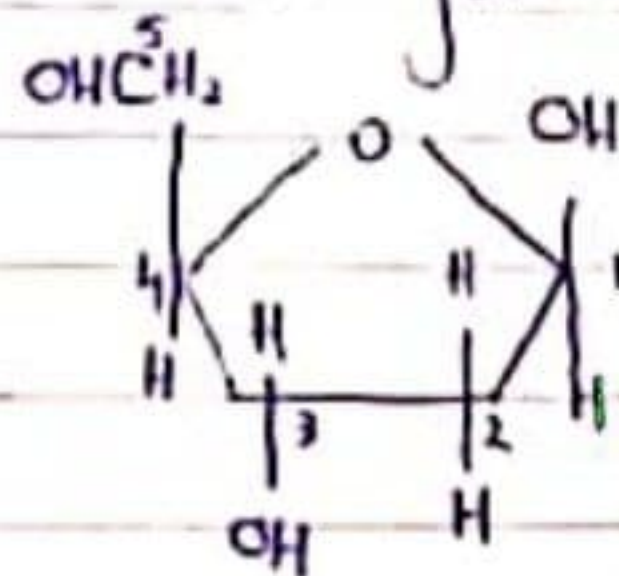
is the process of making an RNA copy of a specific DNA sequence. The copy is called messenger RNA.

Translation

is the synthesis of protein when mRNA from nucleus comes out many ribosomes attach with it and for protein.

c)

DNA has deoxyribose sugar



(6)

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a) Significance of minerals

They are most important for maintaining all physiological process constituents the teeth, bones, tissues, blood, muscle and nerve cells.

b) deficiency of Ca & phosphorus

deficiency of calcium leads to hyperparathyroidism and rickets, osteomalacia as well as osteoporosis.

If phosphorus is deficient it causes disturbance in muscles, kidney, heartbeat and nerve conduction.



C) Importance of Zinc metal

It is necessary for enzymes catalyzation.

If it is removed from the catalytic site enzyme activity is lost.

Zinc absorption cause enteropathia

Zinc deficiency can leads problem to dermal, gastrointestinal, neurologic problems.