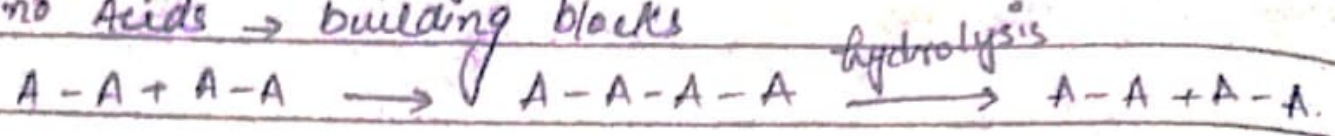


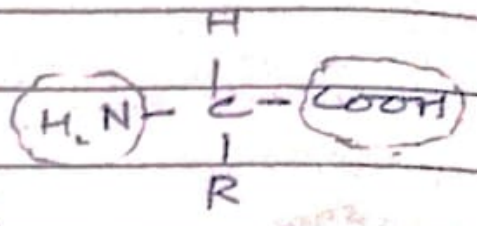
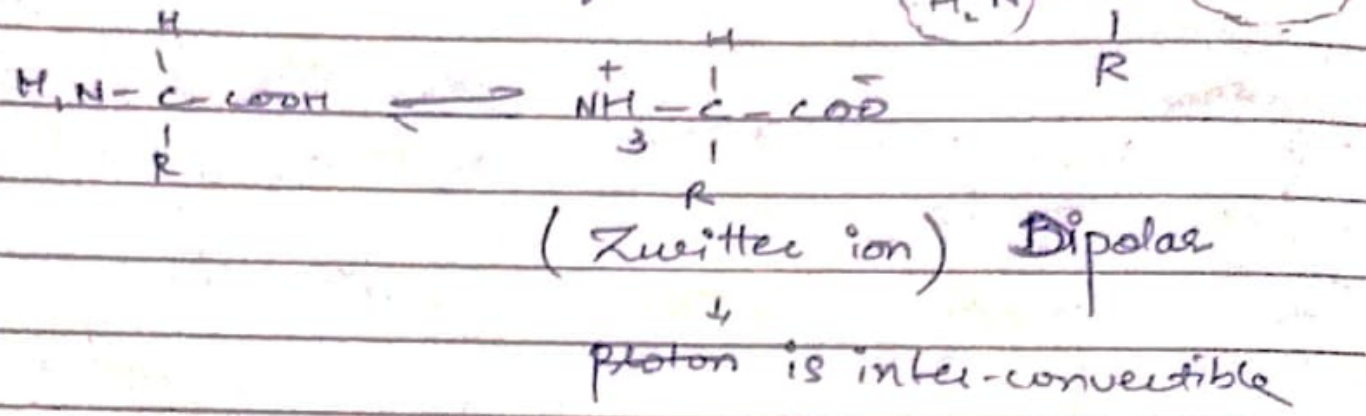
but benzene undergo nitration by means of
conc. HNO₃ / conc. H₂SO₄ at 50°C

AMINO ACIDS & PROTEINS

Amino Acids → building blocks



→ Amino acids → Bifunctional



Zwitter is German word which means two

Properties

- A.A are colourless, crystalline substances have sweet taste and melt at high temp.
- A.A are soluble in polar solvent i.e. H₂O but insoluble in inorganic solvents i.e. ether, benzene
- Except glycine, all A.A are optically active, because they have asymmetric carbon.

Types

Mosely, they are divided into 2-types
Essential

- Non-essential

Primary

Those structure of protein in which AA are arranged in linear sequence.

Secondary

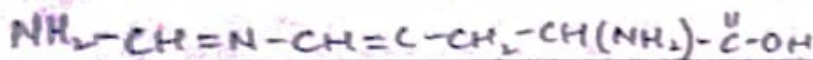
Those structures in which AA are arranged in space (3D) which form coiled structure.

Tertiary

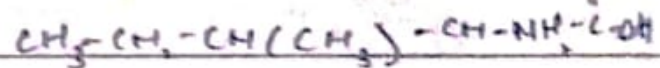
Those protein which contain hydrogen bonding, disulphide bridge & ionic interaction which bind peptide chain into definite shape which change function & physiological properties of protein.

ESSENTIAL A.As

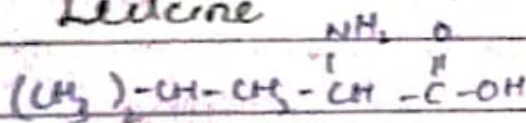
Histidine



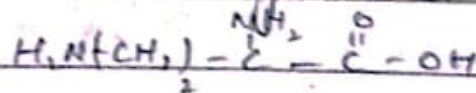
Isoleucine



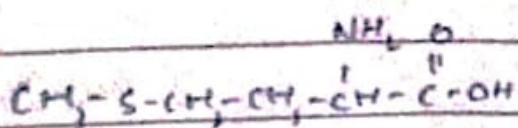
Leucine



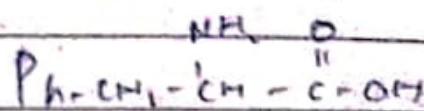
Lysine



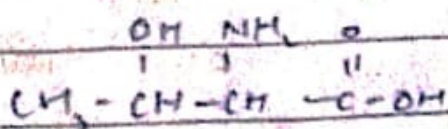
Methionine



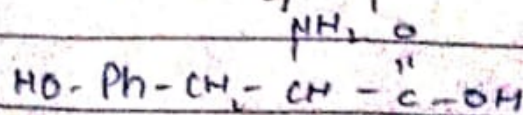
Phenylalanine



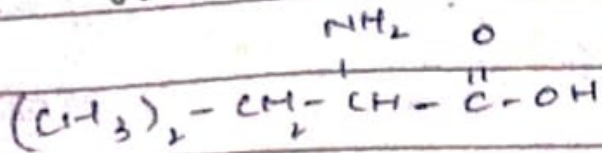
Threonine



Tryptophan

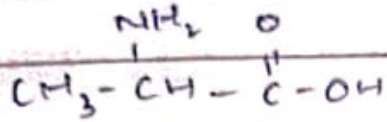


Valine

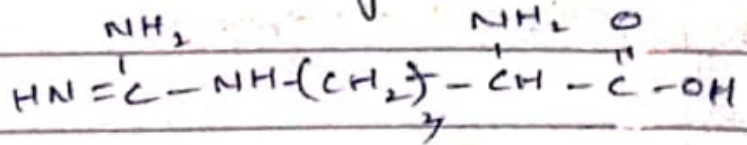


NON-ESSENTIAL AAs

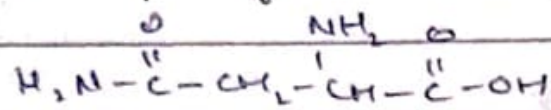
Alanine



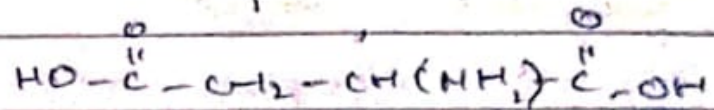
Arginine



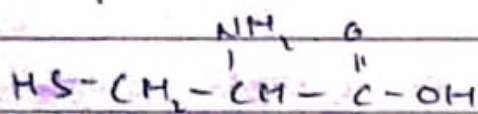
Asparagine



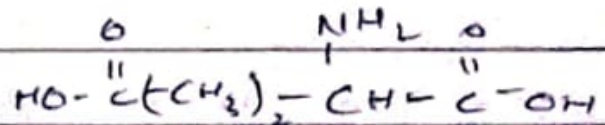
Aspartic Acid



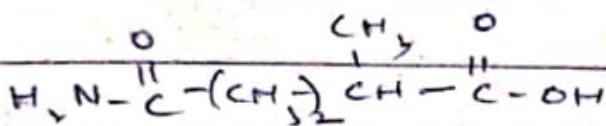
Aspartic Cysteine



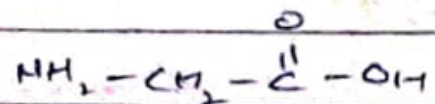
Glutamic Acid



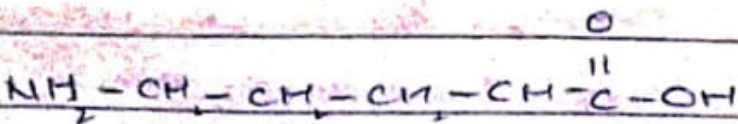
Glutamine



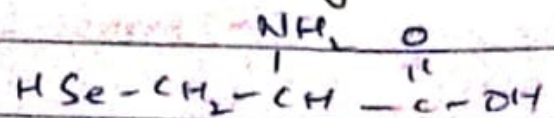
Glycine



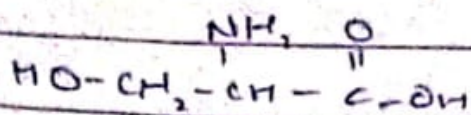
Proline



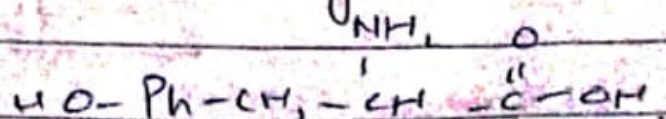
Selenocysteine



Serine



Tyrosine



Mon Tue Wed Thu Fri Sat

Date: / / 20

CLASSIFICATION OF PROTEIN

(Basis of composition)

Chemical Composition

- 1- Simple proteins
- 2- Conjugated proteins

→ In simple proteins, chain of A.A unites together only by amide linkage - Upon hydrolysis it gives mixture of A.A.

- e.g.
- Albumins - egg, blood serum
 - Globulins tissue serum
 - Glutenins - wheat, rice

→ Conjugated proteins are made up of simple proteins which unite covalently or non-covalently bonding with non-protein factor i.e prosthetic groups

- e.g.
- Glucoprotein - mucinⁿ saliva, carbohydrate
 - Phosphoproteins - phosphoric acid, other phosphorus containing compound
 - Chromoproteins - Haemoglobin in blood cell
↓
colour due to Fe pigment.

Based on
Molecular Shape

2-Types

- 1- Fibrous protein
- 2- Globular protein

→ Fibrous protein is like fibre, poly peptide chain coil about one another " held together by

Strong H.B among A.A. Used for connection, support & basic structures in living organism.
Insoluble in H_2O

- eg
- Keratin - nail, hair, skin
 - Myosin - muscles
 - Collagen - Tendons, cartilage

→ Globular proteins are spherical in shape. polypeptide chain coiled back & forth on themselves & form spherical molecules.

compact spheroids. Such proteins are soluble in H_2O , sol. of acid, base & salts.

Regulates the life process in living organisms.

- eg
- Pepsin - stomach, involved in digestion of food
 - Insulin - pancreas - regulate glucose metabolism of body.

DM-I - Insulin dependent

DM-II - Insulin independent

- Haemoglobin - blood stream - regulate O_2 from lungs to all body parts.
- Antibodies - protect body from outside infection.
- Cytochromes - Blood - act as e^- carrier.

Physical Properties

- Non-volatile, colourless
- Tasteless, odourless, amorphous - No definite M.P.
- Mostly insoluble in H_2O , ethanol, ether but completely dissolve in acid, bases, salt. Keratin - insoluble
- Colloidal in nature, shows dispersed solution
- Can't pass through cell membrane i.e. urine is filtered & dialysed & retain protein in blood stream.

- Protein is heated - it is coagulated & bonding forces b/w chain are disrupted so protein loses its natural form & also physiological activity & become denatured.

Chemical Properties

- Hydrolysis

- Oxidation

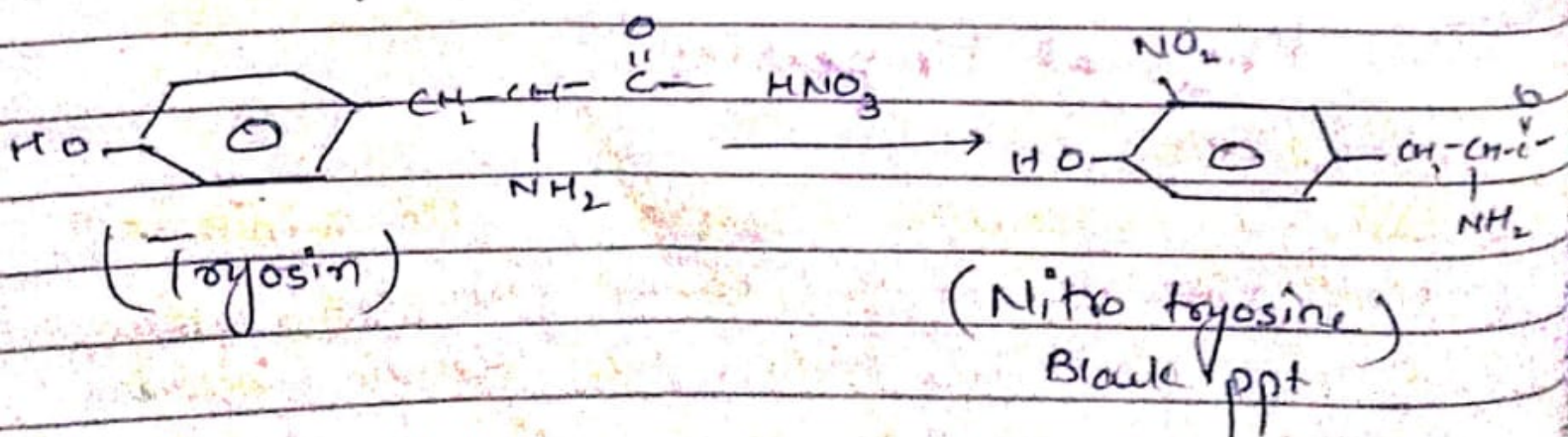
- Colour Test $\left\{ \begin{array}{l} \text{Xanthoproteic Test} \\ \text{Biuret Test} \\ \text{Ninhydrin Test} \end{array} \right.$

→ Protein $\xrightarrow{\text{hydrolysis}}$ A-A + A-A
acid / alkali / enzyme (amylase)

→ Protein oxidized on burning & given nitrogen, amines, CO_2 , H_2O
eg. Bad smell from decaying dead animals is due to amine products by bacterial oxidation of body proteins.

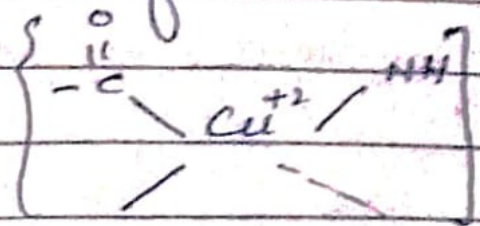
→ Colour Test - Detect Protein

1- Xanthoproteic - ~~pro~~



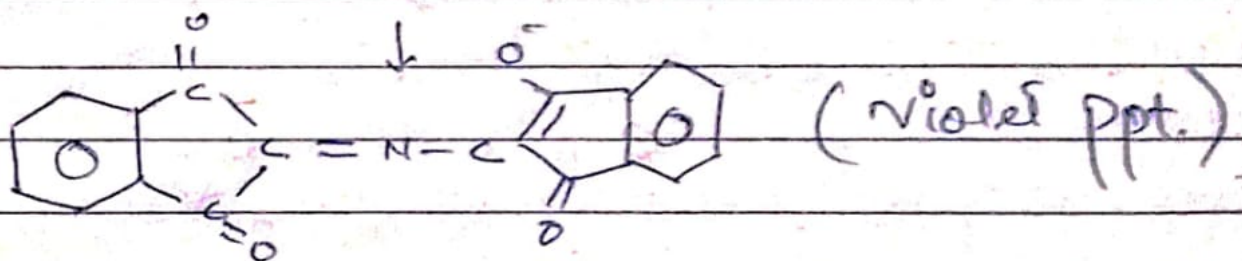
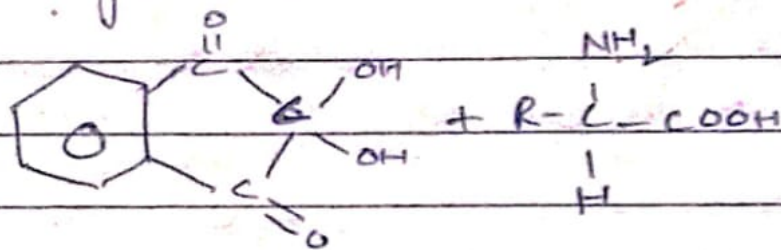
Brown Test

Dilute CuSO_4 sol. added to protein solution
Violet colour appears due to formation
of coordination comp. b/w



Ninhydrin Test

(Ninhydrin)



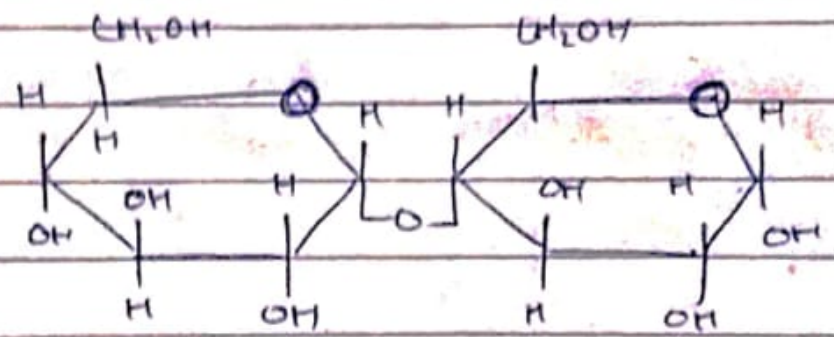
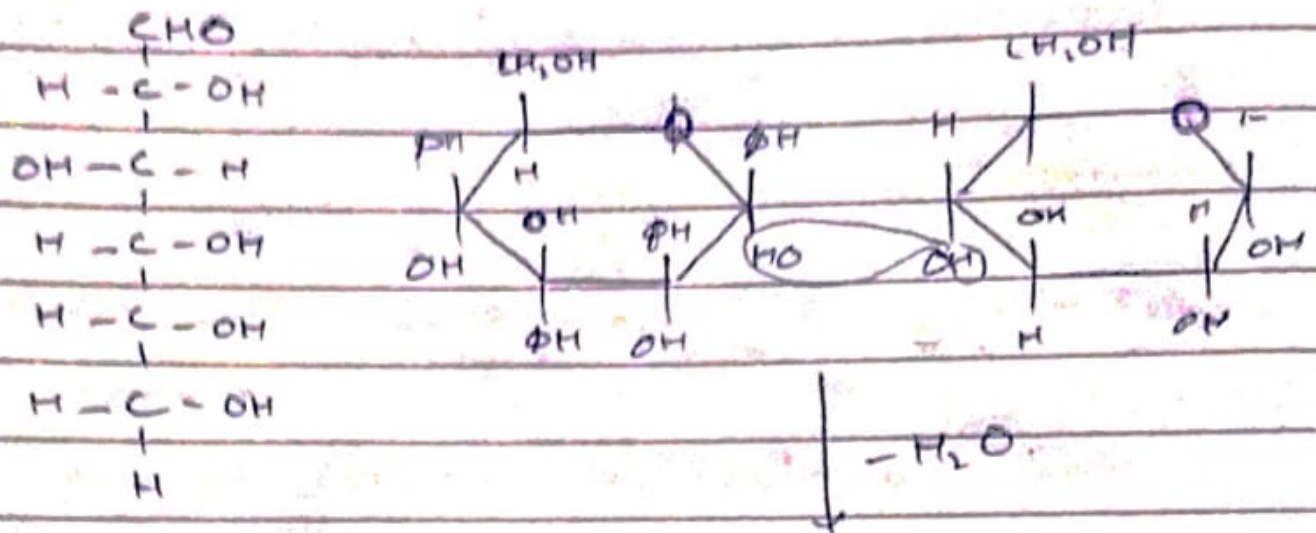
These tests are imp for α -amino acids

NUCLEIC ACIDS

DNA, RNA, mRNA.

CARBONHYDRATES $(C_nH_{2n}O)_n$

- Monosaccharides $\rightarrow C_6H_{12}O_6$ - Glucose, fructose
- Disaccharides $\rightarrow C_6H_{12}O_6 + C_6H_{12}O_6 \rightarrow C_{12}H_{22}O_{11}$
(Sucrose)
- Polysaccharides $\rightarrow G + G + G \dots \rightarrow (G-G-G)_n$



(α -1,4 glycosidic linkage)

