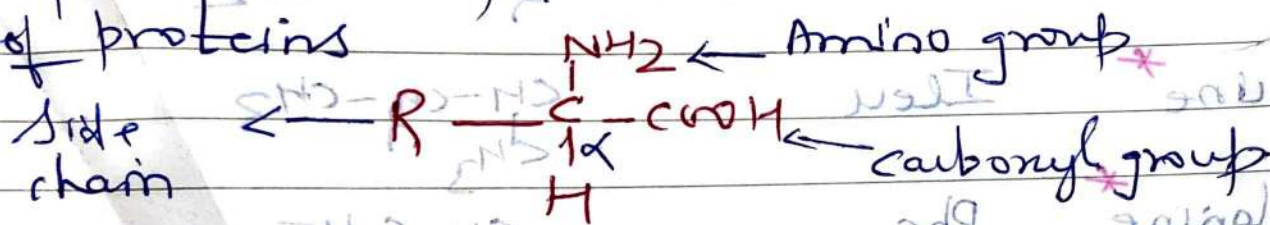


α -Amino acids

Amino acids contains $(-NH_2)$ & $(-COOH)$ as a functional group. Depending upon the relative position of the $-NH_2$ group with $-COOH$ group, the amino acids are classified as α , β , γ , δ - etc.

Only α -amino acids are obtained by hydrolysis of proteins. Thus, α -amino acids are building blocks of proteins.

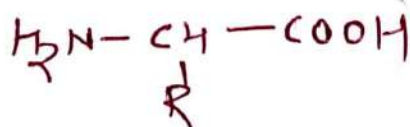


Though a large no. of amino acids exist in nature, out of these, 20 amino acids occur in almost all the proteins. These amino acids differ from one another in the nature of side chain group.

(Trivial name) Glycine - Glyco - Sweet in taste
tyrosine - obtained from cheese - tyro means cheese

Each amino acid has been given a standard abbreviation or code which usually consists of the three letters of the common name.

Eg Gly $\rightarrow$ Glycine
Ala $\rightarrow$ Alanine.



Date: _____

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Amino Acid Symbol R

1) Glycine

Gly

H

2) Alanine

Ala

CH₃

3) Valine*

Val

CH(CH₃)₂

4) Leucine*

Leu

CH₂-CH(CH₃)₂

5) Isoleucine*

Ileu

CH-CH-CH₃
|
CH₃

6) Phenylalanine*

Phe

-CH₂-C₆H₅

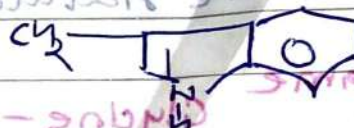
7) Methionine*

Met

-CH₂-CH₂-S-CH₃

8) Tryptophan*

Trp



9) Serine

Ser

CH₂-OH

10) Cysteine

Cys

CH₂-SH

11) Glutamine

Gln

CH₂-CH₂-CONH₂

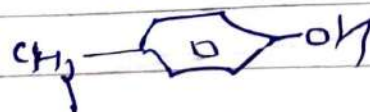
12) Threonine*

Thr

CH-CH₃
|
OH

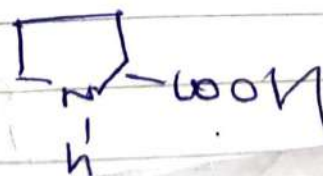
Tyrosine

Tyr



Proline

Pro





Date:

Page No.:

Amino
Acid

Symbol

side R

1) Glycine

Gly

H

2nd amino acid

2) Alanine

Ala

CH₃

3) Valine*

Val

CH(CH₃)₂

4) Leucine*

Leu

CH₂-CH(CH₃)₂

5) Isoleucine*

Ileu

CH-CH-CH₃

6) Phenylalanine*

Phe

-CH₂-C₆H₅

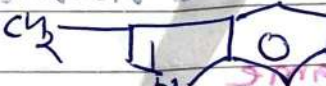
7) Methionine*

Met

-CH₂-CH₂-S-CH₃

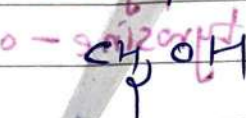
8) Tryptophan*

Trp



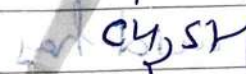
9) Serine*

Ser



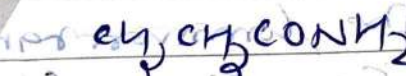
10) Cysteine

Cys



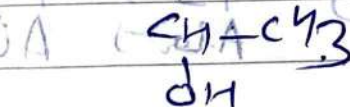
11) Glutamine

Gln



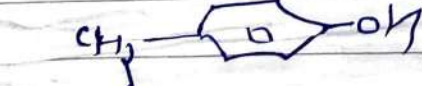
12) Threonine*

Thr



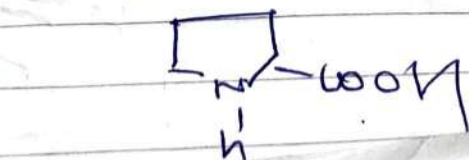
13) Tyrosine

Tyr



Proline

Pro



Amino acid

Symbol

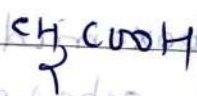
R

Structure of amino acids

Acidic

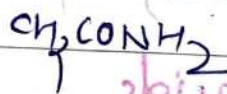
15) Aspartic acid

Asp



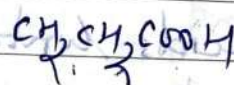
16) Asparagine

Asn



17) Glutamic acid

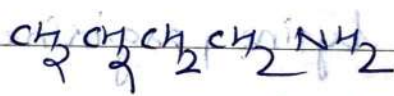
Glu



Basic

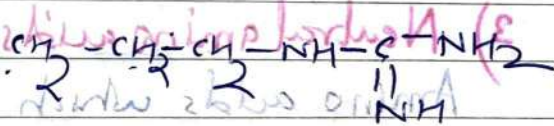
18) Lysine*

Lys



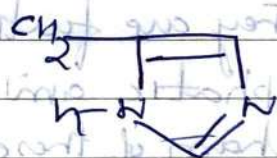
19) Arginine*

Arg

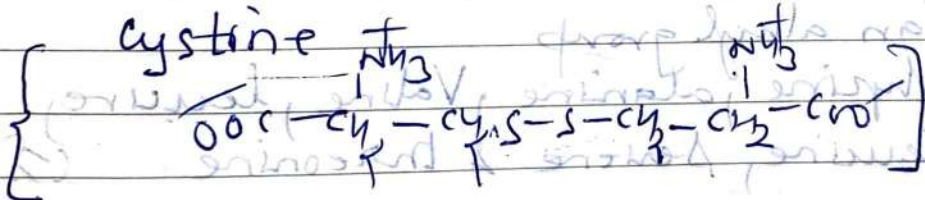


20) Histidine

His



Cysteine



Classification of Amino acids

I Upon chemical nature

1) Acidic amino acids

These amino acids contain in their side chain, a carboxylic or Carboxamide gp.
Eg:- aspartic acid, asparagine, Glutamic acid.

2) Basic amino acids

These amino acids contain in their side chain a basic group such as amino group or an Imidazole ring.

Eg - lysine, arginine & histidine

3) Neutral amino acids

Amino acids which contains one $-COOH$ & one $-NH_2$ group. They are further classified as

(i) Aliphatic amino acids

The side chain of these amino acids contains either hydrogen or an alkyl group

Eg - glycine, alanine, Valine, leucine, isoleucine, Serine & threonine.

(ii) Aromatic neutral amino acids

The side chain of these amino acids contains an aromatic ring

Eg - Phenylalanine & tyrosine.

(iii) Sulfur containing neutral amino acids

The side chain of these amino acids contains $-SH$ group or $S-R$ gp

Eg methionine & cysteine

(iv) Heterocyclic neutral amino acids
 The side chain of these amino acids contains heterocyclic gp
 eg: tryptophan, proline

II classification based on nutrition importance

- 1) Essential amino acids
- 2) Non-essential α -amino acids

Out of 20 amino acids required for protein synthesis, human body can synthesize only 10. These ten amino acids which the body can synthesize are called non-essential/dispensable amino acids while the remaining ten amino acids which human body cannot synthesize are called essential amino acids.

essential amino acids

Valine, leucine, isoleucine, phenylalanine, methionine, tryptophan, threonine, lysine, arginine & histidine

Configuration

The α -Carbon of all the amino acids (except glycine) is chiral & hence amino acids can exist in two stereoisomeric forms i.e. D & L.

However, all the naturally occurring amino acids belongs to L-series.

