

Virtual University of Pakistan

BT404

Food Biotechnology

Midterms solved Past Papers

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solved *by Zareen Fatima*

Bt404 (food biotechnology)

Mcqs

- 1) Food composition tell us about? protein, carbohydrates, fat, vitamins and minerals
- 2) Water activity of honey is: 0.75
- 3) Which amino acid act as helix breaker? Proline
- 4) Oxygen can participate with 4 maximum hydrogen.
- 5) Which one is heteropolysaccharides. hyaluronic acid, chondroitin
- 6) Moisture content in milk: 87
- 7) Nutrition energy value of protein: 17 kJ/g or 4 kcal/g
- 8) Non essential amino acid is.....Proline
- 9) Gelatin and zein contain about.....alanine 9%
- 10) Non reducing disaccharides are.....Sucrose
- 11) Raffinose is composed ofGalactose, glucose, fructose
- 12) Animal protein contain....2-4%
- 13) formula of carbohydrate--- (CH₂O)_n,
- 14) composition of molasses is----- high amount of fructose
- 15) type 2 b turn...glycine.. required on position 3,

Name of Four type of carbohydrates (2)

Ans: 1. Monosaccharides

2. Disaccharides

3. Oligosaccharides

4. Polysaccharides

What is the occurrence of glutamic acid (2)

Ans: •First isolated from wheat gluten by Ritthausen in 1866. •It is abundant in most proteins, but is particularly high in milk proteins (21.7%), wheat (31.4%), corn (18.4%) and soya (18.5%). •Molasses also contains relatively high amounts

of glutamic acid.

Write three name of basic amino acids. (3)

Ans: Lysine, arginine, histidine

What is fibrous protein. Write its two examples. (3)

Ans: . Fibrous proteins •Entire peptide chain is packed or arranged within a single regular structure for a variety of fibrous proteins. •Stabilization of these structures is achieved by intermolecular bonding (electrostatic interaction and disulfide linkages, but primarily hydrogen bonds and hydrophobic interactions).

Examples •wool keratin (α -helix), silk fibroin (β -sheet structure) and collagen (a triple helix)

What is beta turn. Describe its type. (5)

Ans: β Turns •Also known as β -bends, tight turns, reverse turns •Are a type of non-regular secondary structure in proteins that cause a change in direction of the polypeptide chain. •They occur at hairpin corners where the peptide chain changes direction abruptly. •Such corners involve four amino acid residues often including proline and glycine.

•Several types of turns are known; of greatest importance are ☐Type I (42% of 421 examined turns) ☐ Type II (15%) ☐Type III (18%)

Type I β -turns • All amino acid residues are allowed, with the exception of proline in position 3. Type II β -turns • In type II, glycine is required in position 3. Type III β -turns • In type III, all amino acids are allowed.

Classification of amino acid on the basis of nutrition. Give two example of each type (5)

Ans: •Classification of amino acids on the basis of nutrition:

1. Essential amino acids: •These amino acids are not synthesized in cells of human beings, so these should be essentially present in diet. •Phenylalanine, valine, threonine, tryptophan, isoleucine, methionine, histidine, arginine, leucine, lysine •Arginine is conditional amino acids (essential for infants, non essential for adults)

2. Non essential amino acids: •These amino acids can be synthesized in body, so need not be included in diet. •Glycine, alanine, serine, cysteine, asparagine, glutamine, aspartic acid, glutamic acid, tyrosine, proline

Types of secondary structure of protein?

Ans: Alpha helix •In an α helix, the carbonyl (C=O) of one amino acid is hydrogen bonded to the amino H (N-H) of an amino acid that is four down the chain.

•In a β pleated sheet, two or more segments of a polypeptide chain line up next to each other, forming a sheet-like structure held together by hydrogen bonds.
•The hydrogen bonding in a β -sheet is between strands (interstrand) rather than within strands (intra-strand).

Forces that rise tertiary structure of protein?

Ans: The forces that give rise to the tertiary structure of a protein are ☐Ionic bonding ☐Hydrogen bonding ☐Hydrophobic interaction ☐Disulfide bonds

Reducing disaccharides?

Ans: 1. Reducing disaccharides in which one monosaccharide, the reducing sugar of the pair, still has a free hemiacetal unit that can perform as a reducing aldehyde group

Examples •Cellobiose •Maltose

Define water activity?

Ans: • “The partial vapor pressure of water in a substance divided by the standard state partial vapor pressure of water.”

• With reference to food it is defined as

Where

$$a_w = P/P_0$$

P = partial vapor pressure of food moisture
at temperature T

P₀ = saturation vapor pressure of pure
water at T

- Pure distilled water has a water activity of exactly one.
- Higher a_w substances tend to support more microorganisms.
- Bacteria usually require at least 0.91, and fungi at least 0.7.