Chapter 02 Testbank

Student: _____

1. Individual carbon atoms may form four covalent bonds with other atoms. This allows them to form

A. inorganic molecules.

B. linear molecules.

C. branched molecules.

D. both linear and branched molecules.

E. reactive molecules.

2. Functional groups attached to a carbon-hydrogen core provide characteristic chemical properties. Which of the following statements about functional groups is INCORRECT?

A. A carboxyl group may lose an electron and provide a negative charge to the group.

B. A phosphate group in water readily loses a proton to form an unstable ion.

C. A hydroxyl group (-OH) is polar and readily forms hydrogen bonds.

D. A thiol group (-SH) does not form hydrogen bonds.

E. An amino group in water readily accepts a H+ ion to become positively charged.

3. DNA is the biomolecule that provides the information for that organism. Which of the following statements about DNA is CORRECT?

A. All cells in an organism have the same DNA, but differently expressed, providing specific cellular functions.

B. Nucleic acid molecules consist of long chains of nucleotides joined by a glycosidic bond between the monosaccharide and the phosphate group.

C. In DNA, the monosaccharide is 2'-ribose and the bases are adenine, cytosine, guanine and thymine.

D. DNA consists of two strands, held together by specific complementary interactions between the phosphate groups.

E. The ability of the DNA to replicate itself with a high degree of precision is due to the ability of the bases on different nucleic acid chains to recognise each other by specific covalent bonding.

4. Which of the following molecules is not found in RNA?

A. Adenine

B. Cytosine

C. Guanine

D. Thymine

E. Uracil

5. The diversity of organic biomolecules is possible because

A. carbon atoms are able to hydrogen bond in water and stabilise structures.

B. carbon atoms readily interact with nitrogen and phosphorus atoms.

C. carbon atoms are able to form single, double and triple bonds to form stable molecules.

D. carbon atoms are able to form ionic bonds with many different atoms.

E. carbon atoms are able to form four strong covalent bonds with carbon and other elements.

6. Phospholipids are important

A. as hormones.

B. as a component of deoxyribonucleic acid.

C. in the formation of cell membranes.

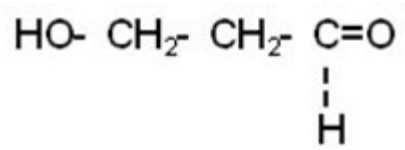
D. as components of ribosomes.

E. for intracellular transport of energy.

F. attraction between positively and negatively charged ions of the same element.

7.

Which functional groups are present on this molecule?



A. Hydroxyl and carbonyl

B. Carboxyl and carbonyl

C. Hydroxyl and thiol

D. Hydroxyl and carboxyl

E. Amino and carboxyl

8. Which of the following is not a polymer of smaller units?

A. Protein

B. Deoxyribonucleic acid

C. Lipid

D. Carbohydrate

E. Glycoprotein

9. Which of the following is not an important organic molecule in human cells?

A. Glycogen

B. Phospholipids.

C. Starch

D. Amino acids

E. Lactose

10. Which of the following statements about functional groups is INCORRECT?

A. Organic molecules consist predominantly of carbon bonded to other atoms of hydrogen, oxygen, nitrogen, phosphorus or sulfur. Other combinations, called functional groups, may be attached.

B. Functional groups maintain their properties no matter where they occur.

C. Functional groups are essential for the properties of the biomolecule.

D. The hydroxyl functional group (OH) is polar and readily forms hydrogen bonds.

E. The thiol group (SH), found on some amino acids, readily forms hydrogen bonds.

11. Polysaccharides are both structural and storage molecules. Which of the following is NOT a structural molecule?

A. Cellulose

B. Starch

C. Chitin

D. Hyaluronan

E. Heparin sulfate.

12. A chiral carbon is

A. the carbon in a monosaccharide to which the carbonyl group is attached.

B. the carbon involved in the formation of a cyclic structure in monosaccharides in solution.

C. the first carbon in the monosaccharide chain.

D. a carbon with 4 different functional groups attached.

E. All of these answers are true.

13. Sucrose is used by plants to transport energy. This is because

A. sucrose is less likely to be metabolised during transport.

B. fructose is sweeter than glucose and so provides more energy than glucose when broken down.

C. the disaccharide sucrose is more reactive than the monosaccharide glucose.

D. sucrose contains fructose and glucose and so more energy is transported by the disaccharide than by a monosaccharide.

E. sucrose is more soluble in plant sap then glucose, and so more readily transported.

F. accepting OH^- ions as pH falls and releasing H^+ ions as pH rises.

14. Molecules that are composed principally of carbon linked to the elements hydrogen, oxygen, nitrogen, phosphorus and sulphur, are known as

A. macromolecules.

B. proteins.

C. organic molecules.

D. lipids.

E. carbohydrates.

15. Which of the following types of molecule would be most abundant in a typical plant cell?

A. Water

B. Lipids

C. Proteins

D. Nucleic acids

E. Carbohydrates

16. Which of the following groups of compounds are all carbohydrates?

A. Starch, deoxyribose, glycogen

B. Glucose, cholesterol, cellulose

C. Haemoglobin, cellulose, glucose

D. Cellulose, fructose, steroid

E. Triacylglyceride, chitin, fructose

17. Polysaccharides are polymers of

A. amino acids.

B. simple sugars.

C. sterols.

D. nucleotides.

E. triglycerides.

18. Starch and cellulose molecules are both

A. used by plants as an energy store.

B. structurally important in plants.

C. entirely composed of monosaccharides with the formula $C_6(H_2O)_6$.

D. unable to be digested by most animals.

E. long, unbranched chains of glucose monomers.

19. The structural differences between simple sugars that give them their distinctive properties include

A. whether the molecule has an open-chain or ring (cyclic) configuration.

B. differences in the number of carbon atoms in the molecule.

C. differences in the positions of the glycosidic linkages within the molecule.

D. the configuration of the atoms around the chiral carbon.

E. all of the answers are correct.

20. While studying the biochemistry of a species of plant found in alpine bogs, a biologist discovers a previously unknown biomolecule composed entirely of carbon, hydrogen and oxygen. The molecule is a polymer composed of many thousands of a single type of subunit, and has a complex branching structure. This new biomolecule could be

A. a carbohydrate involved in energy storage.

B. a protein that functions in structural support.

C. a nucleic acid involved in energy transfer.

D. a glycoprotein involved in communication between cells.

E. a lipid that is an integral component of cell membranes.

21. All lipids

A. are more soluble in non-polar solvents than in water.

B. have long hydrocarbon chains.

C. are made up of fatty acids.

D. are hydrophilic.

E. are involved in the structure of cell walls.

22. Which of the following are all lipids?

A. Phospholipids, fats, glycogen

B. Waxes, triacylglycerols, cholesterol

C. Testosterone, vitamin A, chitin

D. Fructose, steroids, glycolipids

E. Phospholipids, waxes, haemoglobin

23. If a phospholipid is added to water it tends to form a stable bilayer because

A. the hydrophilic tails exclude water.

B. the phosphate ‘heads' are non-polar.

C. the molecule has both hydrophilic and hydrophobic groups.

D. lipids are insoluble in water.

E. lipids are reactive and readily bind to other molecules.

24. Lipids

A. can act as enzymes.

B. contain more energy per gram than carbohydrates or proteins.

C. have a complex branching structure.

D. are large polymers that contain only carbon and hydrogen atoms.

E. have poor insulation qualities.

25. Proteins contain

A. carbon, hydrogen and oxygen only.

B. carbon, hydrogen, oxygen and sometimes nitrogen.

C. carbon, hydrogen, oxygen, nitrogen and sometimes sulfur.

D. carbon, oxygen, nitrogen and sometimes phosphorus.

E. carbon, hydrogen, oxygen and sometimes sulfur.

26. Proteins are polymers of

A. amino acids linked by peptide bonds.

B. monosaccharides joined by glycosidic linkages.

C. nucleotides linked by phosphodiester bonds.

D. amino acids linked by phosphodiester bonds.

E. peptides stabilised by hydrogen bonds.

27. All amino acids have the same general structure:

A. a central R-group, linked to a basic amino group and an acidic carboxyl group.

B. an amino group, a carboxyl group and a number of different R-groups, joined to a central carbon atom.

C. a central carbon atom attached to an amino group, a carboxyl group and one of 20 different ribose groups.

D. an amino group, a carboxyl group and one of a variety of different side-chain groups, bonded to a central carbon atom.

E. an amino acid group and a carboxyl group linked through an R-group to form a linear molecule.

28. Aspartate and glutamate are both acidic amino acids. They are similar in structure but have different

A. amino groups.

B. peptide groups.

C. carboxyl groups.

D. hydroxyl groups.

E. R-groups (side-chain groups).

29. The tertiary structure of a protein refers to the

A. linear order of the amino acids in the polypeptide chain.

B. folding pattern of the polypeptide chain due to side-chain interactions between amino acids relatively close to each other.

C. folding pattern of the polypeptide chain due to side-chain interactions between amino acids relatively far apart from each other.

D. folding pattern of the polypeptide chain due to the covalent interaction between distal amino acids.

E. type of bond joining the amino acids in the polypeptide chain.

30. The specific three-dimensional shape assumed spontaneously by a large, complex protein is determined primarily by

A. the sequence of amino acids in its polypeptide chain(s).

B. the hydrophobic interactions between distant amino acids.

C. the arrangement of the R-groups along its polypeptide backbone that lead to particular patterns of coiling or folding.

D. the positions of the intra- and inter-molecular cross-links that stabilise the spatial relationships among different parts of the molecule.

E. interactions between polar and non-polar regions of the molecule, stabilised by hydrogen bonding and van der Waals forces.

31. In a series of laboratory experiments, you discover that reducing the pH of an enzymatic reaction reduces the biological activity of the enzyme to zero. When the change in pH is reversed the activity of the enzyme returns to normal. The best explanation for these observations is that at low pH the active site of the enzyme becomes non-functional because of a change in the enzyme's

A. primary structure.

B. secondary structure.

C. primary and secondary structure.

D. tertiary structure.

E. primary and tertiary structure.

32. Proteins can function as

A. steroid hormones in animals.

B. structural elements of the cytoskeleton of protists.

C. water-repelling agents on the external surface of animals or plants.

D. energy storage molecules in cells.

E. all of the statements are correct.

33. Which of the following compounds is made of protein?

A. DNA

B. Silk

C. Glycogen

D. Cholesterol

E. Chitin

34. All nucleic acids

A. are composed of amino acids.

B. are found within the nucleus of the cell.

C. are composed of nucleotides.

D. are glucose linked through phosphodiester bonds.

E. act as stores of genetic information.

35. All nucleotides have

A. an amino group and a carboxyl group.

B. an amino group and a ribose sugar.

C. a deoxyribose sugar and a phosphate group.

D. a deoxyribose sugar and a nitrogenous base.

E. a nitrogenous base and a phosphate group.

36. DNA is a polymer composed of

A. nucleotides and amino acids joined by phosphodiester linkages and peptide bonds.

B. nucleotides and ribose monosaccharides joined by phosphodiester linkages and complementary base pairing.

C. nucleotides joined by phosphodiester linkages and hydrogen bonds.

D. nucleotides joined to ribose monosaccharides by a phosphodiester bond.

E. nucleotides, ribose monosaccharides and phosphate groups, joined by phosphodiester and glycosidic linkages.

37. Carbohydrates and fatty acids are sources of energy because

A. they have functional side groups.

B. their core groups contain ionic bonds that can be reduced to release energy.

C. they consist of complex polymers in a highly energised state.

D. their covalent bonds can be oxidised to release energy.

E. all carbohydrates and fatty acids form tetrahedral bonds to charged ions.

38. A hydrolysis reaction is so called because

A. it involves the removal of water between monomers.

B. it involves the removal of water from a polymer.

C. it involves the addition of water between monomers.

D. it involves the addition or removal of water from a monomer or polymer.

E. all the options listed here are correct.

39. DNA is

A. an acronym for deoxyribonucleic acid.

B. found in all living cells.

C. transferred from generation to generation.

D. decoded via RNA.

E. all the options listed here are correct.

40. A scientist tells you about a molecule she has recently isolated from a previously undiscovered organism and describes it as a purine. This molecule could therefore be

A. adenine.

B. uracil.

C. cytosine.

D. thymine.

E. All the options listed here are incorrect.

41. You attend a meeting with undergraduate students who are discussing the structure of proteins. Student one argues that the formation of tertiary structures comes after quaternary processing, while student two maintains that tertiary structures are typically formed before quaternary processing. Which student is correct?

A. Just as secondary follows primary, so too does tertiary follow quaternary, therefore student two is correct.

B. Just as secondary follows primary, so too does quaternary follow tertiary, therefore student one is correct.

C. Just as secondary follows primary, so too does quaternary follow tertiary, therefore student two is correct.

D. Just as secondary follows primary, so too does tertiary follow quaternary, therefore student one is correct.

E. Both students are incorrect.

42. Which of the following is NOT a general structure of amino acids found in a protein?

A. A variety of different side-chain groups

B. An acidic carboxyl group

C. Linked by peptide bonds

D. A basic amino group

E. A ribonucleic acid group

43. Elastin is what type of protein?

A. Proteoglycan

B. Fibrous

C. Globular

D. Glycoprotein

E. Disaccharide

44. Globular proteins are compact and spherical in structure, which is reflective of their typical function. Given this, what is a likely function of a globular protein?

A. Macrofibril

B. Muscle

C. Keratin

D. Insulin

E. Collagen

45. When carbohydrate monomers are joined to form polymers, a reaction occurs in which water is released. What sort of reaction is this?

A. Condensation

B. Hydrolysis

C. Redox

D. Exothermic

E. Precipitation

Chapter 02 Testbank Key

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A. inorganic molecules.

B. linear molecules.

C. branched molecules.

D. both linear and branched molecules.

E. reactive molecules.

Bloom's: Knowledge
Difficulty: Easy
Learning Objective: 2.2. Describe the structure, function and importance of the three main groups of carbohydrate.
Section: Biomolecules

2. Functional groups attached to a carbon-hydrogen core provide characteristic chemical properties. Which of the following statements about functional groups is INCORRECT?

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Bloom's: Knowledge
Difficulty: Medium
Learning Objective: 2.1. Define 'organic molecules' and 'functional groups' and give examples of important functional groups of biomolecules.
Section: Biomolecules

3. DNA is the biomolecule that provides the information for that organism. Which of the following statements about DNA is CORRECT?

A. All cells in an organism have the same DNA, but differently expressed, providing specific cellular functions.

B. Nucleic acid molecules consist of long chains of nucleotides joined by a glycosidic bond between the monosaccharide and the phosphate group.

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D. DNA consists of two strands, held together by specific complementary interactions between the phosphate groups.

E. The ability of the DNA to replicate itself with a high degree of precision is due to the ability of the bases on different nucleic acid chains to recognise each other by specific covalent bonding.

Bloom's: Knowledge
Difficulty: Medium
Learning Objective: 2.5. Describe the structure, function and importance of nucleic acids.
Section: Biomolecules

4. Which of the following molecules is not found in RNA?

A. Adenine

B. Cytosine

C. Guanine

D. Thymine

E. Uracil

Bloom's: Knowledge
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Section: Biomolecules

5. The diversity of organic biomolecules is possible because

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6. Phospholipids are important

A. as hormones.

B. as a component of deoxyribonucleic acid.

C. in the formation of cell membranes.

D. as components of ribosomes.

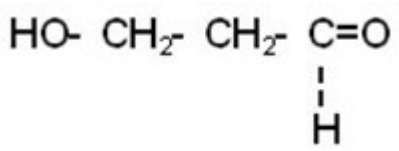
E. for intracellular transport of energy.

F. attraction between positively and negatively charged ions of the same element.

Bloom's: Knowledge
Difficulty: Medium
Learning Objective: 2.3. Describe the structure, function and importance of lipids.
Section: Lipids

7.

Which functional groups are present on this molecule?



A. Hydroxyl and carbonyl

B. Carboxyl and carbonyl

C. Hydroxyl and thiol

D. Hydroxyl and carboxyl

E. Amino and carboxyl

Bloom's: Comprehension
Difficulty: Medium
Learning Objective: 2.1. Define 'organic molecules' and 'functional groups' and give examples of important functional groups of biomolecules.
Section: Biomolecules

8. Which of the following is not a polymer of smaller units?

A. Protein

B. Deoxyribonucleic acid

C. Lipid

D. Carbohydrate

E. Glycoprotein

Bloom's: Knowledge
Difficulty: Easy
Learning Objective: 2.1. Define 'organic molecules' and 'functional groups' and give examples of important functional groups of biomolecules.
Section: Biomolecules

9. Which of the following is not an important organic molecule in human cells?

A. Glycogen

B. Phospholipids.

C. Starch

D. Amino acids

E. Lactose

Bloom's: Knowledge
Difficulty: Medium
Learning Objective: 2.1. Define 'organic molecules' and 'functional groups' and give examples of important functional groups of biomolecules.
Section: Biomolecules
Section: Carbohydrates

10. Which of the following statements about functional groups is INCORRECT?

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B. Functional groups maintain their properties no matter where they occur.

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D. The hydroxyl functional group (OH) is polar and readily forms hydrogen bonds.

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Bloom's: Knowledge
Difficulty: Hard
Learning Objective: 2.1. Define 'organic molecules' and 'functional groups' and give examples of important functional groups of biomolecules.
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11. Polysaccharides are both structural and storage molecules. Which of the following is NOT a structural molecule?

A. Cellulose

B. Starch

C. Chitin

D. Hyaluronan

E. Heparin sulfate.

Bloom's: Knowledge
Difficulty: Medium
Learning Objective: 2.2. Describe the structure, function and importance of the three main groups of carbohydrate.
Section: Carbohydrates

12. A chiral carbon is

A. the carbon in a monosaccharide to which the carbonyl group is attached.

B. the carbon involved in the formation of a cyclic structure in monosaccharides in solution.

C. the first carbon in the monosaccharide chain.

D. a carbon with 4 different functional groups attached.

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E. sucrose is more soluble in plant sap then glucose, and so more readily transported.

F. accepting OH^- ions as pH falls and releasing H^+ ions as pH rises.

Bloom's: Knowledge
Difficulty: Hard
Learning Objective: 2.2. Describe the structure, function and importance of the three main groups of carbohydrate.
Section: Carbohydrates

14. Molecules that are composed principally of carbon linked to the elements hydrogen, oxygen, nitrogen, phosphorus and sulphur, are known as

A. macromolecules.

B. proteins.

C. organic molecules.

D. lipids.

E. carbohydrates.

Bloom's: Knowledge
Difficulty: Easy
Learning Objective: 2.1. Define 'organic molecules' and 'functional groups' and give examples of important functional groups of biomolecules.
Section: Biomolecules

15. Which of the following types of molecule would be most abundant in a typical plant cell?

A. Water

B. Lipids

C. Proteins

D. Nucleic acids

E. Carbohydrates

Bloom's: Knowledge
Difficulty: Easy
Learning Objective: 2.1. Define 'organic molecules' and 'functional groups' and give examples of important functional groups of biomolecules.
Section: Biomolecules

16. Which of the following groups of compounds are all carbohydrates?

A. Starch, deoxyribose, glycogen

B. Glucose, cholesterol, cellulose

C. Haemoglobin, cellulose, glucose

D. Cellulose, fructose, steroid

E. Triacylglyceride, chitin, fructose

Bloom's: Knowledge
Difficulty: Easy
Learning Objective: 2.2. Describe the structure, function and importance of the three main groups of carbohydrate.
Section: Carbohydrates

17. Polysaccharides are polymers of

A. amino acids.

B. simple sugars.

C. sterols.

D. nucleotides.

E. triglycerides.

Bloom's: Knowledge
Difficulty: Easy
Learning Objective: 2.2. Describe the structure, function and importance of the three main groups of carbohydrate.
Section: Carbohydrates

18. Starch and cellulose molecules are both

A. used by plants as an energy store.

B. structurally important in plants.

C. entirely composed of monosaccharides with the formula $C_6(H_2O)_6$.

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Difficulty: Medium
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Section: Carbohydrates

19. The structural differences between simple sugars that give them their distinctive properties include

A. whether the molecule has an open-chain or ring (cyclic) configuration.

B. differences in the number of carbon atoms in the molecule.

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D. the configuration of the atoms around the chiral carbon.

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Section: Carbohydrates

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B. a protein that functions in structural support.

C. a nucleic acid involved in energy transfer.

D. a glycoprotein involved in communication between cells.

E. a lipid that is an integral component of cell membranes.

Bloom's: Knowledge
Difficulty: Hard
Learning Objective: 2.2. Describe the structure, function and importance of the three main groups of carbohydrate.
Section: Carbohydrates

21. All lipids

A. are more soluble in non-polar solvents than in water.

B. have long hydrocarbon chains.

C. are made up of fatty acids.

D. are hydrophilic.

E. are involved in the structure of cell walls.

Bloom's: Knowledge
Difficulty: Medium
Learning Objective: 2.3. Describe the structure, function and importance of lipids.
Section: Lipids

22. Which of the following are all lipids?

A. Phospholipids, fats, glycogen

B. Waxes, triacylglycerols, cholesterol

C. Testosterone, vitamin A, chitin

D. Fructose, steroids, glycolipids

E. Phospholipids, waxes, haemoglobin

Bloom's: Knowledge
Difficulty: Medium
Learning Objective: 2.3. Describe the structure, function and importance of lipids.
Section: Lipids

23. If a phospholipid is added to water it tends to form a stable bilayer because

A. the hydrophilic tails exclude water.

B. the phosphate ‘heads' are non-polar.

C. the molecule has both hydrophilic and hydrophobic groups.

D. lipids are insoluble in water.

E. lipids are reactive and readily bind to other molecules.

Bloom's: Knowledge
Difficulty: Medium
Learning Objective: 2.3. Describe the structure, function and importance of lipids.
Section: Lipids

24. Lipids

A. can act as enzymes.

B. contain more energy per gram than carbohydrates or proteins.

C. have a complex branching structure.

D. are large polymers that contain only carbon and hydrogen atoms.

E. have poor insulation qualities.

Bloom's: Knowledge
Difficulty: Easy
Learning Objective: 2.3. Describe the structure, function and importance of lipids.
Section: Lipids

25. Proteins contain

A. carbon, hydrogen and oxygen only.

B. carbon, hydrogen, oxygen and sometimes nitrogen.

C. carbon, hydrogen, oxygen, nitrogen and sometimes sulfur.

D. carbon, oxygen, nitrogen and sometimes phosphorus.

E. carbon, hydrogen, oxygen and sometimes sulfur.

Bloom's: Knowledge
Difficulty: Easy
Learning Objective: 2.4. Describe the structure, function and importance of proteins.
Section: Proteins

26. Proteins are polymers of

A. amino acids linked by peptide bonds.

B. monosaccharides joined by glycosidic linkages.

C. nucleotides linked by phosphodiester bonds.

D. amino acids linked by phosphodiester bonds.

E. peptides stabilised by hydrogen bonds.

Bloom's: Knowledge
Difficulty: Medium
Learning Objective: 2.4. Describe the structure, function and importance of proteins.
Section: Proteins

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D. an amino group, a carboxyl group and one of a variety of different side-chain groups, bonded to a central carbon atom.

E. an amino acid group and a carboxyl group linked through an R-group to form a linear molecule.

Bloom's: Knowledge
Difficulty: Medium
Learning Objective: 2.4. Describe the structure, function and importance of proteins.
Section: Proteins

28. Aspartate and glutamate are both acidic amino acids. They are similar in structure but have different

A. amino groups.

B. peptide groups.

C. carboxyl groups.

D. hydroxyl groups.

E. R-groups (side-chain groups).

Bloom's: Knowledge
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Learning Objective: 2.4. Describe the structure, function and importance of proteins.
Section: Proteins

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C. primary and secondary structure.

D. tertiary structure.

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Bloom's: Application
Difficulty: Medium
Learning Objective: 2.4. Describe the structure, function and importance of proteins.
Section: Proteins

32. Proteins can function as

A. steroid hormones in animals.

B. structural elements of the cytoskeleton of protists.

C. water-repelling agents on the external surface of animals or plants.

D. energy storage molecules in cells.

E. all of the statements are correct.

Bloom's: Knowledge
Difficulty: Easy
Learning Objective: 2.4. Describe the structure, function and importance of proteins.
Section: Proteins

33. Which of the following compounds is made of protein?

A. DNA

B. Silk

C. Glycogen

D. Cholesterol

E. Chitin

Bloom's: Knowledge
Difficulty: Easy
Learning Objective: 2.4. Describe the structure, function and importance of proteins.
Section: Proteins

34. All nucleic acids

A. are composed of amino acids.

B. are found within the nucleus of the cell.

C. are composed of nucleotides.

D. are glucose linked through phosphodiester bonds.

E. act as stores of genetic information.

Bloom's: Knowledge
Difficulty: Easy
Learning Objective: 2.5. Describe the structure, function and importance of nucleic acids.
Section: Nucleic acids

35. All nucleotides have

A. an amino group and a carboxyl group.

B. an amino group and a ribose sugar.

C. a deoxyribose sugar and a phosphate group.

D. a deoxyribose sugar and a nitrogenous base.

E. a nitrogenous base and a phosphate group.

Bloom's: Knowledge
Difficulty: Medium
Learning Objective: 2.5. Describe the structure, function and importance of nucleic acids.
Section: Nucleic acids

36. DNA is a polymer composed of

A. nucleotides and amino acids joined by phosphodiester linkages and peptide bonds.

B. nucleotides and ribose monosaccharides joined by phosphodiester linkages and complementary base pairing.

C. nucleotides joined by phosphodiester linkages and hydrogen bonds.

D. nucleotides joined to ribose monosaccharides by a phosphodiester bond.

E. nucleotides, ribose monosaccharides and phosphate groups, joined by phosphodiester and glycosidic linkages.

Bloom's: Knowledge
Difficulty: Hard
Learning Objective: 2.5. Describe the structure, function and importance of nucleic acids.
Section: Nucleic acids

37. Carbohydrates and fatty acids are sources of energy because

A. they have functional side groups.

B. their core groups contain ionic bonds that can be reduced to release energy.

C. they consist of complex polymers in a highly energised state.

D. their covalent bonds can be oxidised to release energy.

E. all carbohydrates and fatty acids form tetrahedral bonds to charged ions.

Bloom's: Knowledge
Difficulty: Medium
Learning Objective: 2.1. Define 'organic molecules' and 'functional groups' and give examples of important functional groups of biomolecules.
Section: Biomolecules

38. A hydrolysis reaction is so called because

A. it involves the removal of water between monomers.

B. it involves the removal of water from a polymer.

C. it involves the addition of water between monomers.

D. it involves the addition or removal of water from a monomer or polymer.

E. all the options listed here are correct.

Bloom's: Comprehension
Difficulty: Hard
Learning Objective: 2.1. Define 'organic molecules' and 'functional groups' and give examples of important functional groups of biomolecules.
Section: Biomolecules

39. DNA is

A. an acronym for deoxyribonucleic acid.

B. found in all living cells.

C. transferred from generation to generation.

D. decoded via RNA.

E. all the options listed here are correct.

Bloom's: Knowledge
Difficulty: Easy
Learning Objective: 2.1. Define 'organic molecules' and 'functional groups' and give examples of important functional groups of biomolecules.
Section: Nucleic acids

40. A scientist tells you about a molecule she has recently isolated from a previously undiscovered organism and describes it as a purine. This molecule could therefore be

A. adenine.

B. uracil.

C. cytosine.

D. thymine.

E. All the options listed here are incorrect.

Bloom's: Knowledge
Difficulty: Medium
Learning Objective: 2.1. Define 'organic molecules' and 'functional groups' and give examples of important functional groups of biomolecules.
Section: Nucleic acids

41. You attend a meeting with undergraduate students who are discussing the structure of proteins. Student one argues that the formation of tertiary structures comes after quaternary processing, while student two maintains that tertiary structures are typically formed before quaternary processing. Which student is correct?

A. Just as secondary follows primary, so too does tertiary follow quaternary, therefore student two is correct.

B. Just as secondary follows primary, so too does quaternary follow tertiary, therefore student one is correct.

C. Just as secondary follows primary, so too does quaternary follow tertiary, therefore student two is correct.

D. Just as secondary follows primary, so too does tertiary follow quaternary, therefore student one is correct.

E. Both students are incorrect.

Bloom's: Evaluation
Difficulty: Hard
Learning Objective: 2.4. Describe the structure, function and importance of proteins.
Section: Proteins

42. Which of the following is NOT a general structure of amino acids found in a protein?

A. A variety of different side-chain groups

B. An acidic carboxyl group

C. Linked by peptide bonds

D. A basic amino group

E. A ribonucleic acid group

Bloom's: Knowledge
Difficulty: Medium
Learning Objective: 2.4. Describe the structure, function and importance of proteins.
Section: Proteins

43. Elastin is what type of protein?

A. Proteoglycan

B. Fibrous

C. Globular

D. Glycoprotein

E. Disaccharide

Bloom's: Knowledge
Difficulty: Medium
Learning Objective: 2.4. Describe the structure, function and importance of proteins.
Section: Proteins

44. Globular proteins are compact and spherical in structure, which is reflective of their typical function. Given this, what is a likely function of a globular protein?

A. Macrofibril

B. Muscle

C. Keratin

D. Insulin

E. Collagen

Bloom's: Evaluation
Difficulty: Medium
Learning Objective: 2.4. Describe the structure, function and importance of proteins.
Section: Proteins

45. When carbohydrate monomers are joined to form polymers, a reaction occurs in which water is released. What sort of reaction is this?

A. Condensation

B. Hydrolysis

C. Redox

D. Exothermic

E. Precipitation

Bloom's: Knowledge
Difficulty: Easy
Learning Objective: 2.2. Describe the structure, function and importance of the three main groups of carbohydrate.
Section: Carbohydrates

Chapter 02 Testbank Summary

Category	*# of Questions*
Bloom's: Application	1
Bloom's: Comprehension	2
Bloom's: Evaluation	2
Bloom's: Knowledge	40
Difficulty: Easy	15
Difficulty: Hard	6
Difficulty: Medium	24
Learning Objective: 2.1. Define 'organic molecules' and 'functional groups' and give examples of important functional groups of biomolecules.	12
Learning Objective: 2.2. Describe the structure, function and importance of the three main groups of carbohydrate.	10
Learning Objective: 2.3. Describe the structure, function and importance of lipids.	5
Learning Objective: 2.4. Describe the structure, function and importance of proteins.	13
Learning Objective: 2.5. Describe the structure, function and importance of nucleic acids.	5
Section: Biomolecules	13
Section: Carbohydrates	10
Section: Lipids	5
Section: Nucleic acids	5
Section: Proteins	13