Principles of Cell Biology 3rd edition Plopper Test Bank

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Chapter: Chapter 01 – Quiz

Multiple Choice

1. Which statement best explains why cells are considered the “fundamental unit of life”?
A) Cells are composed primarily of carbon.
B) Cells are the smallest structure capable of replicating and repairing themselves.
C) Cells are enclosed in a membrane.
D) Cells contain a nucleus.
E) Cells evolve over time.
Ans: B
Complexity: Easy
Ahead: Life Can Arise from Simple Ingredients
Subject: Chapter 1
Title: Life is a Team Sport
Taxonomy: Analyze

2. The bond that holds two or more H_2O molecules together in liquid water is called a/n _____ bond.
A) ionic
B) covalent
C) hydrogen
D) peptide
E) double
Ans: C
Complexity: Easy
Ahead: Life Can Arise from Simple Ingredients
Subject: Chapter 1
Title: Life is a Team Sport
Taxonomy: Recall

3. Which domain has more variation within its population?

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A) Bacteria because they developed before Archaea and Eukarya and, therefore, had more time to introduce variation.
B) Eukarya because Bacteria and Archaea lost the ability to perform codepoiesis.
C) Archaea because they developed before Bacteria and Eukarya and, therefore, had more time to introduce variation.
D) Bacteria because Eukarya and Archaea lost the ability to perform codepoiesis.
E) We cannot know which domain has the most variation within it.
Ans: B
Complexity: Moderate
Ahead: Life Can Arise from Simple Ingredients
Subject: Chapter 1
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Taxonomy: Application

4. Is it possible for a hydrogen bond to form between two sugars?
A) No. Sugars are held together by glycosidic bonds only.
B) Yes. The –OH group of one sugar donates a hydrogen to the –OH group on another sugar to form water.
C) No. Sugars form hydrogen bonds with phosphate groups.
D) Yes. The δ- on the oxygen of an –OH group can be attracted to the δ+ of the hydrogen on another –OH group.
E) No. The C=O group required to form hydrogen bonds is lost when a sugar changes from a linear to a ring structure.
Ans: D
Complexity: Difficult
Ahead: Life Can Arise from Simple Ingredients
Subject: Chapter 1
Title: Life is a Team Sport
Taxonomy: Application

5. Which statement best describes the difference between α1,4 and β1,4 glycosidic bonds in polysaccharides?
A) α1,4 bonds hold riboses together; most β1,4 bonds hold glucoses together.
B) α1,4 bonds are found only in animals; most β1,4 bonds are found in plants.
C) α1,4 bonds are stronger than most β1,4 bonds.
D) α1,4 bonds cannot be broken by human enzymes; most β1,4 bonds can.
E) α1,4 bonds can be broken by human enzymes; most β1,4 bonds cannot.
Ans: E
Complexity: Moderate
Ahead: All Cells Are Built from the Same Common Molecular Building Blocks
Subject: Chapter 1
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6. Which of the following functional groups are nonpolar?
A) Alkyl
B) Alcohol
C) Aldehyde
D) Amide
E) None of these is correct.

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Ans: A
Complexity: Easy
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7. What is the difference between a saturated and an unsaturated fatty acid?
A) Unsaturated fatty acids contain at least one double bond. Saturated fatty acids contain no double bonds.
B) Saturated fatty acids contain at least one double bond. Unsaturated fatty acids contain no double bonds.
C) Unsaturated fatty acids can be incorporated into triglycerides; saturated fatty acids cannot.
D) Saturated fatty acids can be incorporated into triglycerides; unsaturated fatty acids cannot.
E) Saturated fatty acids are hydrophilic and can dissolve in water; unsaturated fatty acids are hydrophobic and do not dissolve in water.
Ans: A
Complexity: Easy
Ahead: All Cells Are Built from the Same Common Molecular Building Blocks
Subject: Chapter 1
Title: Life is a Team Sport
Taxonomy: Recall

8. An atom of carbon will form _____ bonds with other atoms to completely fill its outer shell of electrons.
A) three covalent
B) four covalent
C) three ionic
D) four ionic
E) four hydrogen
Ans: B
Complexity: Easy
Ahead: All Cells Are Built from the Same Common Molecular Building Blocks
Subject: Chapter 1
Title: Life is a Team Sport
Taxonomy: Recall

9. Which of the following best describes a peptide bond?
A) An ionic bond formed between the carboxylic acid group of one amino acid and the amino group of another
B) An ionic bond formed between the alpha carbon of one amino acid and the beta carbon of another
C) A covalent bond formed between the carboxylic acid group of one amino acid and the amino group of another
D) A covalent bond formed between the alpha carbon of one amino acid and the beta carbon of another
E) A covalent bond between two linear sequences of amino acids that forms a protein
Ans: C
Complexity: Easy
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Taxonomy: Recall

10. In a nucleotide, the phosphate group attaches to the _____ carbon of the sugar.
A) 1′
B) 2′
C) 3′
D) 4′
E) 5′
Ans: E
Complexity: Easy
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Taxonomy: Recall

11. Which statement is true?
A) The structure and function of vast ecosystems are usually unrelated.
B) The structure and function of individual molecules are usually unrelated.
C) The structure-function relationship states that the structure of individual molecules can show us the function vast ecosystems.
D) The structure-function relationship states that the structure of vast ecosystems can show us the function of individual molecules.
E) None of these is correct.
Ans: E
Complexity: Moderate
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Taxonomy: Application

12. Which one of the following structures provides a selective barrier to the prokaryotic cell?
A) Cell membrane
B) Cytosol
C) Ribosomes
D) Nucleus
E) Polysaccharides
Ans: A
Complexity: Easy
Ahead: Cells Must Cooperate to Succeed
Subject: Chapter 1
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Taxonomy: Recall

13. What is the function of chloroplasts?
A) Energy storage
B) Cell transcription
C) Allowing passage of molecules
D) Harnessing light energy from the sun

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E) Converting food to cellular energy
Ans: D
Complexity: Easy
Ahead: Cells Must Cooperate to Succeed
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Taxonomy: Recall

14. Which of the following is not an organelle in Eukaryotic cells?
A) The mitochondria because it is only found in Prokaryotes.
B) The chloroplast because it is not found in animal cells.
C) The rough endoplasmic reticulum because it contains ribosomes.
D) The cytoskeleton because it is not enclosed in a separate membrane.
E) The nucleus because it contains the cell's DNA.
Ans: D
Complexity: Moderate
Ahead: Cells Must Cooperate to Succeed
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Taxonomy: Application

Essay

1. List the 5 unusual traits of water.
Ans: Water is the only molecule of its size that exists as a liquid at room temperature and normal atmospheric pressure. Water is a very polar molecule. Liquid water has a higher density than solid water. Water has a high specific heat. Water has a high heat of vaporization.
Complexity: Moderate
Ahead: Life Can Arise from Simple Ingredients
Subject: Chapter 1
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Taxonomy: Recall

2. What are some ways to define life? What distinguishes living from non-living? Based off this, would you say that viruses are alive?
Ans: Life is a chemical system capable of Darwinian evolution. Objects that are alive must be able to generate nearly exact copies of themselves and self-correct any damage. All living beings are composed of cells. The question of whether a virus is alive or not, continues to be debated amongst biologists. Viruses are able to self-replicate using DNA and RNA. However, they require a host cell to replicate in. Where it becomes even less certain is in the fact that viruses cannot self-repair. However, they can continue to make new viruses.
Complexity: Difficult
Ahead: Life Can Arise from Simple Ingredients
Subject: Chapter 1
Title: Life is a Team Sport
Taxonomy: Analyze

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3. Explain the endosymbiotic theory.
Ans: It is the idea that an organelle's double membrane (like that surrounding the nucleus) developed when a cell was engulfed, but not destroyed, and then developed a symbiotic relationship with its host.
Complexity: Moderate
Ahead: Cells Must Cooperate to Succeed
Subject: Chapter 1
Title: Life is a Team Sport
Taxonomy: Analyze

4. List three differences between prokaryotes and eukaryotes.
Ans: Responses will vary.
Complexity: Moderate
Ahead: Cells Must Cooperate to Succeed
Subject: Chapter 1
Title: Life is a Team Sport
Taxonomy: Recall

5. How has the recognition of holobionts changed the way scientists view evolution?
Ans: A human and its microbiome can now be viewed as a single "superorganism" that evolves as a unified collection of genes, collectively called the hologenome. This also means that human health and disease can be traced back to changes in the microbiome.
Complexity: Difficult
Ahead: Cells Must Cooperate to Succeed
Subject: Chapter 1
Title: Life is a Team Sport
Taxonomy: Analyze

6. Discuss the different organelles found in eukaryotic cells and their functions.
Ans: Responses will vary.
Complexity: Moderate
Ahead: Cells Must Cooperate to Succeed
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Taxonomy: Analyze

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