

Package Title: Testbank  
Course Title: eb4  
Chapter Number: 1  
Shuffle: Yes  
Case Sensitive: No

Question type: Multiple Choice

1) Which of the following is the most abundant element in the human body?

- A) nitrogen
- B) carbon
- C) oxygen
- D) phosphorous
- E) none of the above

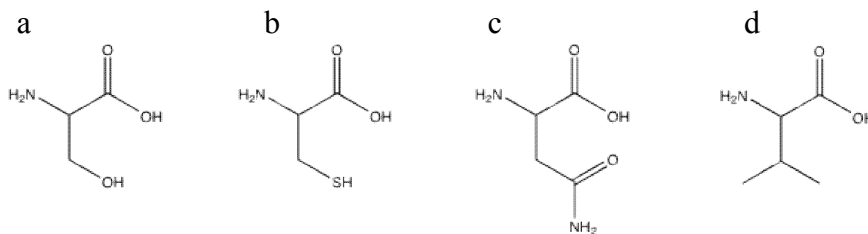
Answer: B

Difficulty: Easy

Section Reference: 1-2

Learning Objective: Identify the major classes of biological molecules

2) Of the following amino acids, which contains an alcohol?



- A) a
- B) b
- C) c
- D) d
- E) all of the above

Answer: A

Difficulty: Easy

Section Reference: 1-2

Learning Objective: Identify the major classes of biological molecules

3) Which of the major types of biomolecules is never found in a polymeric form?

- A) amino acids
- B) carbohydrates
- C) nucleotides
- D) lipids
- E) none of the above

Answer: D

Difficulty: Medium

Section Reference: 1-2

Learning Objective: Identify the major classes of biological molecules

4) Which of the following biopolymers is correctly paired with the bond that forms between the monomers?

- A) protein: ester bond
- B) polysaccharide: glycosidic bond
- C) DNA: phosphate bond
- D) RNA: phosphate bond
- E) all of the above

Answer: B

Difficulty: Hard

Section Reference: 1-2

Learning Objective: Identify the major classes of biological molecules

5) Which of the biopolymers is correctly paired with its major function?

- A) protein: information encoding
- B) nucleic acids: energy storage
- C) lipids: information encoding
- D) polysaccharide: energy storage
- E) none of the above

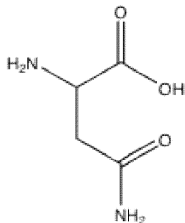
Answer: D

Difficulty: Medium

Section Reference: 1-2

Learning Objective: Identify the major classes of biological molecules

6) What functional groups are present in the following molecule?



- A) amine and carboxylic acid
- B) amine, ketone and carboxylic acid
- C) amine, amide and carboxylic acid
- D) alcohol, amine, amide and carboxylic acid
- E) none of the above are correct

Answer: C

Difficulty: Medium

Section Reference: 1-2

Learning Objective: Identify the major classes of biological molecules

7) Which elements are found in simple carbohydrates?

- A) carbon, hydrogen and oxygen
- B) carbon, hydrogen, oxygen and nitrogen
- C) carbon, hydrogen, oxygen and phosphorous
- D) carbon, hydrogen, oxygen and sulfur
- E) none of the above

Answer: A

Difficulty: Medium

Section Reference: 1-2

Learning Objective: Identify the major classes of biological molecules

8) Entropy is used to measure \_\_\_\_\_.

- A) free energy
- B) heat content
- C) temperature
- D) randomness
- E) all of the above

Answer: D

Difficulty: Easy

Section Reference: 1-3

Learning Objective: Explain how enthalpy, entropy, and free energy apply to biological systems

9) A spontaneous process always has \_\_\_\_\_.

- A)  $\Delta G < 0$
- B)  $\Delta G > 0$
- C)  $\Delta H < 0$
- D)  $\Delta H > 0$
- E) none of the above

Answer: A

Difficulty: Easy

Section Reference: 1-3

Learning Objective: Explain how enthalpy, entropy, and free energy apply to biological systems

10) If a reaction at 37°C has a  $\Delta H$  of 23 kJ/mol and a  $\Delta S$  of 337 J/K•mol, what is the  $\Delta G$  for the reaction?

- A) 65 kJ/mol
- B) -42 kJ/mol
- C) 18 kJ/mol
- D) -19 kJ/mol
- E) none of the above

Answer: D

Difficulty: Hard

Section Reference: 1-3

Learning Objective: Explain how enthalpy, entropy, and free energy apply to biological systems

11) An exergonic process \_\_\_\_\_.

- A) occurs without the addition of free energy
- B) has a  $\Delta G < 0$
- C) is spontaneous
- D) will have more products than reactants at equilibrium
- E) all of the above

Answer: E

Difficulty: Medium

Section Reference: 1-3

Learning Objective: Explain how enthalpy, entropy, and free energy apply to biological systems

12) Which of the following molecules contains the most oxidized form of carbon?

- A) acetaldehyde
- B) ethanol
- C) acetic acid
- D) ethylene
- E) carbon dioxide

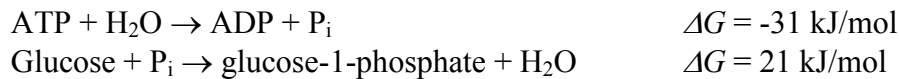
Answer: E

Difficulty: Easy

Section Reference: 1-3

Learning Objective: Explain how enthalpy, entropy, and free energy apply to biological systems

13) If the following two reactions were coupled, what would be the  $\Delta G$  for the overall exergonic reaction?



- A) -52 kJ/mol
- B) -10 kJ/mol
- C) 10 kJ/mol
- D) 52 kJ/mol
- E) none of the above

Answer: B

Difficulty: Medium

Section Reference: 1-3

Learning Objective: Explain how enthalpy, entropy, and free energy apply to biological systems

14) A gaseous mixture of hydrogen, water, ammonia and methane can produce which of the biomolecules when exposed to an electrical discharge (such as lightning)?

- A) carbohydrates

- B) nucleotides
- C) lipids
- D) amino acids
- E) none of the above

Answer: D

Difficulty: Medium

Section Reference: 1-4

Learning Objective: Summarize the evolutionary history of cells

15) Which of the following explains how nucleotides might have polymerized into nucleic acids in the prebiotic world?

- A) a mixture of hydrogen cyanide, formaldehyde and phosphate can form nucleotides in the presence of an electrical discharge
- B) nucleotides formed short polymers in the high temperatures of hydrothermal vents
- C) nucleotides used the surface of clay as a catalyst to form polymers
- D) catalysts such as iron sulfide allow for the formation of new C—C bonds
- E) all of the above

Answer: C

Difficulty: Hard

Section Reference: 1-4

Learning Objective: Summarize the evolutionary history of cells

16) Photosynthetic organisms use energy from the sun to reduce \_\_\_\_\_ to \_\_\_\_\_.

- A) formaldehyde; ethanol
- B) CO<sub>2</sub>; ethanol
- C) CO<sub>2</sub>; carbohydrates
- D) CO<sub>2</sub>; oxygen
- E) none of the above

Answer: C

Difficulty: Medium

Section Reference: 1-4

Learning Objective: Summarize the evolutionary history of cells

17) The biological classification system categorizes organisms into which of the following domains?

- A) bacteria and eukarya
- B) prokarya and eukarya
- C) archaea and eukarya
- D) bacteria, eukarya and prokarya
- E) bacteria, archaea and eukarya

Answer: E

Difficulty: Medium

Section Reference: 1-4

Learning Objective: Summarize the evolutionary history of cells

18) Which of the following is a major difference between eukaryotic and prokaryotic cells?

- A) eukaryotic cells contain a nucleus, prokaryotic cells do not
- B) eukaryotic cells contain organelles, prokaryotic cells do not
- C) eukaryotic cells are much larger than prokaryotic cells
- D) eukaryotic cells often form multicellular organisms, prokaryotic cells do not
- E) all of the above

Answer: E

Difficulty: Easy

Section Reference: 1-4

Learning Objective: Summarize the evolutionary history of cells

19) The similarity of one organism to another (for example a bacteria versus a human) is most easily done by comparing which biopolymer?

- A) nucleic acids
- B) polysaccharides
- C) proteins
- D) lipids
- E) all of the above

Answer: A

Difficulty: Medium

Section Reference: 1-4

Learning Objective: Summarize the evolutionary history of cells

20) Which of the following correctly identifies the progression from individual molecules to a functioning multi-cellular organism?

- A) molecules, cell, organelle, organ, organism
- B) molecules, organelle, organ, cell, organism
- C) molecules, organelle, cell, organ, organism
- D) molecules, organ, organelle, cell, organism
- E) molecules, cell, organ, organelle, organism

Answer: C

Difficulty: Easy

Section Reference: 1-1

Learning Objective: Recognize the main themes of biochemistry

21) The biochemical principle that organisms acquire, transform, store, and use energy requires that cells be able to \_\_\_\_\_.

- A) produce their own energy
- B) convert light into other forms of energy
- C) extract heat from their environment
- D) extract energy from their environment
- E) use only one form of energy from their environment

Answer: D

Difficulty: Easy

Section Reference: 1-1

Learning Objective: Recognize the main themes of biochemistry

Question type: Text Entry

22) What are the four most common elements in biological systems? \_\_\_\_; \_\_\_\_; \_\_\_\_; \_\_\_\_

Answer 1: carbon

Answer 2: hydrogen

Answer 3: nitrogen

Answer 4: oxygen



Difficulty: Easy

Section Reference: 1-2

Learning Objective: Identify the major classes of biological molecules

23) Name the four major types of biomolecules. \_\_\_\_; \_\_\_\_; \_\_\_\_; \_\_\_\_

Answer 1: amino acids

Answer 2: carbohydrates

Answer 3: nucleotides

Answer 4: lipids

Difficulty: Medium

Section Reference: 1-2

Learning Objective: Identify the major classes of biological molecules