
5) Explain the concepts of normal microbiota and transient microbiota and discuss the effect of their pathogenicity.

Section: 1.1

Bloom's Taxonomy: Evaluating

ASMcue Outcome: 5.4

Learning Outcome: 1.2

Global Outcome: 8

***Microbiology: An Introduction, 14e* (Tortora et al.)**

Chapter 2 Chemical Principles

2.1 Multiple Choice Questions

1) Which is the **false** statement about the atom $^{12}_6\text{C}$?

- A) It has 6 protons in its nucleus.
- B) It has 12 neutrons in its nucleus.
- C) It has 6 electrons orbiting the nucleus.
- D) Its atomic number is 6.
- E) Its atomic weight is 12.

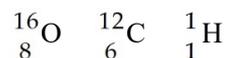
Answer: B

Section: 2.1

Bloom's Taxonomy: Understanding

Learning Outcome: 2.1

2) Table 2.1



Using the information in Table 2.1, calculate the molecular weight of ethanol, $\text{C}_2\text{H}_5\text{OH}$.

- A) 96
- B) 46
- C) 34
- D) 33
- E) The answer cannot be determined.

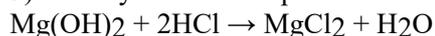
Answer: B

Section: 2.1

Bloom's Taxonomy: Applying

Learning Outcome: 2.1

3) Identify the salt compound in the following equation:



- A) $\text{Mg}(\text{OH})_2$
- B) HCl
- C) MgCl_2
- D) H_2O

E) None of the answers is correct.
Answer: C
Section: 2.4
Bloom's Taxonomy: Understanding
Learning Outcome: 2.5

4) All following statements are true about water, **except**:

- A) Salts readily dissolve in water.
- B) Water molecules are formed by hydrolysis.
- C) Water freezes from the top down.
- D) Water is formed as a part of a dehydration synthesis reaction.
- E) Water is a polar molecule.

Answer: B

Section: 2.4

Bloom's Taxonomy: Recall

Learning Outcome: 2.4

5) What is the chemical bond between K^+ and I^- ions in KI?

- A) Ionic bond
- B) Covalent bond
- C) Hydrogen bond

Answer: A

Section: 2.2

Bloom's Taxonomy: Recall

Learning Outcome: 2.2

6) What is the chemical bond between molecules of water?

- A) Ionic bond
- B) Covalent bond
- C) Hydrogen bond

Answer: C

Section: 2.2

Bloom's Taxonomy: Understanding

Learning Outcome: 2.2

7) What is the chemical bond between hydrogen and oxygen atoms H_2O molecule?

- A) Ionic bond
- B) Covalent bond
- C) Hydrogen bond

Answer: B

Section: 2.2

Bloom's Taxonomy: Recall

Learning Outcome: 2.2

8) The chemical reaction in which $\text{Glucose} + \text{Fructose} \rightarrow \text{Sucrose} + \text{Water}$ is a _____.

- A) dehydration synthesis reaction
- B) hydrolysis reaction
- C) exchange reaction
- D) reversible reaction
- E) ionic reaction

Answer: A

Section: 2.5

Bloom's Taxonomy: Analyzing

Learning Outcome: 2.7

9) The chemical reaction in which $\text{Lactose} + \text{H}_2\text{O} \rightarrow \text{Glucose} + \text{Galactose}$ is a _____.

- A) dehydration synthesis reaction
- B) hydrolysis reaction
- C) exchange reaction
- D) reversible reaction
- E) ionic reaction

Answer: B

Section: 2.5

Bloom's Taxonomy: Analyzing

Learning Outcome: 2.7

10) The chemical reaction in which $\text{HCl} + \text{NaHCO}_3 \rightarrow \text{NaCl} + \text{H}_2\text{CO}_3$ is a _____.

- A) dehydration synthesis reaction
- B) hydrolysis reaction
- C) exchange reaction
- D) reversible reaction
- E) ionic reaction

Answer: C

Section: 2.3

Bloom's Taxonomy: Analyzing

Learning Outcome: 2.3

11) The chemical reaction in which $\text{NH}_4\text{OH} \rightleftharpoons \text{NH}_3 + \text{H}_2\text{O}$ is a _____.

- A) dehydration synthesis reaction
- B) hydrolysis reaction
- C) exchange reaction
- D) reversible reaction
- E) ionic reaction

Answer: D

Section: 2.3

Bloom's Taxonomy: Analyzing

Learning Outcome: 2.3

12) Which type of molecule contains the alcohol glycerol?

- A) Carbohydrate
- B) Phospholipids
- C) DNA
- D) Protein

Answer: B

Section: 2.5

Bloom's Taxonomy: Recall

Learning Outcome: 2.7

13) Which type of molecule is composed of (CH₂O) units?

- A) Carbohydrate
- B) Lipid
- C) Nucleic acid
- D) Protein

Answer: A

Section: 2.5

Bloom's Taxonomy: Recall

Learning Outcome: 2.8

14) Which type of molecule contains the functional group of NH₂?

- A) Carbohydrate
- B) Triglycerides
- C) Nucleic acid
- D) Protein

Answer: D

Section: 2.5

Bloom's Taxonomy: Recall

Learning Outcome: 2.10

15) Which type of molecule does not contain the functional group of phosphate?

- A) Triglycerides
- B) Phospholipid
- C) Nucleic acid
- D) ATP

Answer: A

Section: 2.5

Bloom's Taxonomy: Understanding

Learning Outcome: 2.9

16) How many covalent bonds can be formed between Mg and H in MgH_2 for both atoms to achieve the full complement of electrons in their outermost energy shells?

- A) 1
- B) 2
- C) 3
- D) 4

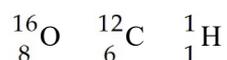
Answer: B

Section: 2.2

Bloom's Taxonomy: Analyzing

Learning Outcome: 2.2

17) Table 2.1



Using the information in Table 2.1, calculate the number of moles in 92 grams of ethanol, C_2H_5OH .

- A) 1
- B) 2
- C) 3
- D) 4
- E) The answer cannot be determined.

Answer: B

Section: 2.2

Bloom's Taxonomy: Applying

Learning Outcome: 2.2

18) All statements about protein structure are true, **except**:

- A) The primary structure is formed by covalent bonding between amino acid subunits.
- B) Secondary structures are formed only from hydrogen bonds.
- C) Tertiary structures are formed only from covalent bonds.
- D) Quaternary structures involved multiple polypeptides.

Answer: C

Section: 2.5

Bloom's Taxonomy: Understanding

Learning Outcome: 2.10

19) Which of the following chemical reaction is identified **incorrectly**?

A) $\text{NaOH} \rightleftharpoons \text{Na}^+ + \text{OH}^-$ is a base.

B) $\text{HF} \rightleftharpoons \text{H}^+ + \text{F}^-$ is an acid.

C) $\text{Mg}_2\text{SO}_4 \rightleftharpoons \text{Mg}^{2+} + \text{SO}_4^{2-}$ is a salt.

D) $\text{KH}_2\text{PO}_4 \rightleftharpoons \text{K}^+ + \text{H}_2\text{PO}_4^-$ is an acid.

E) $\text{H}_2\text{SO}_4 \rightleftharpoons 2\text{H}^+ + \text{SO}_4^{2-}$ is an acid.

Answer: D

Section: 2.4

Bloom's Taxonomy: Analyzing

Learning Outcome: 2.5

20) Table 2.2

$\text{NaOH} \rightleftharpoons \text{Na}^+ + \text{OH}^-$ is a base.

$\text{HF} \rightleftharpoons \text{H}^+ + \text{F}^-$ is an acid.

$\text{MgSO}_4 \rightleftharpoons \text{Mg}^{2+} + \text{SO}_4^{2-}$ is a salt.

$\text{KH}_2\text{PO}_4 \rightleftharpoons \text{K}^+ + \text{H}_2\text{PO}_4^-$ is an acid.

$\text{H}_2\text{SO}_4 \rightleftharpoons 2\text{H}^+ + \text{SO}_4^{2-}$ is an acid.

Which is the **false** statement about the chemical reactions in Table 2.2?

A) They are exchange reactions.

B) They are ionization reactions.

C) They occur when the reactants are dissolved in water.

D) They are dissociation reactions.

E) They are reversible reactions.

Answer: A

Section: 2.4

Bloom's Taxonomy: Analyzing

Learning Outcome: 2.3

21) What is the type of weak bond between the hydrogen of one molecule and the nitrogen of another molecule, where the two don't actively share an electron?

- A) Ionic bond
- B) Covalent bond
- C) Hydrogen bond
- D) Disulfide bond
- E) Hydrophobic bond

Answer: C

Section: 2.2

Bloom's Taxonomy: Recall

Learning Outcome: 2.2

22) _____ occur when carbon, hydrogen, and oxygen atoms share electrons with each other?

- A) Ionic bond
- B) Covalent bond
- C) Hydrogen bond

Answer: B

Section: 2.2

Bloom's Taxonomy: Recall

Learning Outcome: 2.2

23) What is the type of chemical bond between ions in a compound of salt?

- A) Ionic bond
- B) Covalent bond
- C) Hydrogen bond

Answer: A

Section: 2.2

Bloom's Taxonomy: Recall

Learning Outcome: 2.2

24) A scientist wants to perform a test that will indicate whether a nucleic acid sample is composed of either RNA or DNA. Testing for the presence of which of the following is most appropriate in this situation?

- A) Phosphate
- B) Nitrogen
- C) Guanine
- D) Uracil
- E) Thymine

Answer: D

Section: 2.5

Bloom's Taxonomy: Understanding

Learning Outcome: 2.11

25) Structurally, ATP must be present in _____.

- A) carbohydrate
- B) lipid
- C) protein
- D) nucleic acid

Answer: D

Section: 2.5

Bloom's Taxonomy: Understanding

Learning Outcome: 2.12

26) What do genes consist of?

- A) Carbohydrates
- B) Lipids
- C) Proteins
- D) Nucleic acids

Answer: D

Section: 2.5

Bloom's Taxonomy: Recall

Learning Outcome: 2.11

27) _____ is composed of a chain of amino acids?

- A) Carbohydrate
- B) Lipid
- C) Protein
- D) Nucleic acid

Answer: C

Section: 2.5

Bloom's Taxonomy: Recall

Learning Outcome: 2.10

28) Which are the primary chemical compounds found in plasma membranes?

- A) Carbohydrates
- B) Lipids
- C) Proteins
- D) Nucleic acids

Answer: B

Section: 2.5

Bloom's Taxonomy: Recall

Learning Outcome: 2.9

29) The antimicrobial drug imidazole inhibits sterol synthesis. This would most likely interfere with the structure or function of _____.

- A) bacterial cell walls
- B) fungal cell walls
- C) eukaryotic plasma membranes
- D) prokaryotic plasma membranes
- E) genes

Answer: C

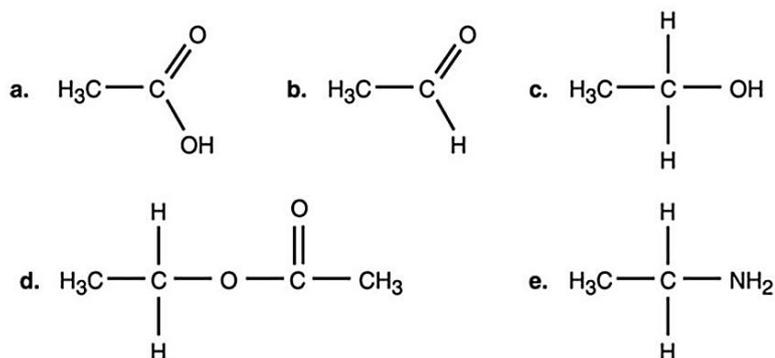
Section: 2.5

Bloom's Taxonomy: Analyzing

ASMcue Outcome: 3.4

Learning Outcome: 2.9

Figure 2.1



30) Which compound in Figure 2.1 is an alcohol?

- A) a
- B) b
- C) c
- D) d
- E) e

Answer: C

Section: 2.5

Bloom's Taxonomy: Analyzing

Learning Outcome: 2.7