An Introduction to General, Organic, and Biological Chemistry, 13e **(Timberlake)**
Chapter 1 Chemistry in Our Lives

1.1 Multiple-Choice Questions

1) Water, H_2O, is an example of a(n) _____.
A) chemical
B) solid
C) wave
D) electric charge
E) element
Answer: A
Page Ref: 1.1
Learning Obj.: 1.1
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

2) In this list, which substance can be classified as a chemical?
A) salt
B) sleep
C) cold
D) heat
E) temperature
Answer: A
Page Ref: 1.1
Learning Obj.: 1.1
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

3) One example of a chemical used in toothpaste is _____.
A) chlorine
B) sulfur
C) carbon dioxide
D) calcium carbonate
E) sugar
Answer: D
Page Ref: 1.1
Learning Obj.: 1.1
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

4) Which of the following is not a chemical?
A) salt
B) water
C) light
D) carbon dioxide
E) sugar
Answer: C
Page Ref: 1.1
Learning Obj.: 1.1
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

5) Sodium fluorophosphate is a chemical used in toothpaste to _____.
A) make the paste white
B) disinfect the toothbrush
C) keep the paste from spoiling
D) remove plaque
E) strengthen tooth enamel
Answer: E
Page Ref: 1.1
Learning Obj.: 1.1
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

6) When a part of the body is injured, substances called _____ are released.
A) aspirins
B) pain relievers
C) nitrogen oxides
D) chlorofluorocarbons
E) prostaglandins
Answer: E
Page Ref: 1.1
Learning Obj.: 1.1
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

7) Titanium dioxide is a chemical used in toothpaste to _____.
A) make the paste white
B) disinfect the toothbrush
C) keep the paste from spoiling
D) remove plaque
E) strengthen tooth enamel
Answer: A
Page Ref: 1.1
Learning Obj.: 1.1
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

8) Which of the following is a chemical?
A) sugar
B) heat
C) light
D) noise
E) a wave
Answer: A
Page Ref: 1.1
Learning Obj.: 1.1
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

9) You notice that there is more traffic between 8 and 9 in the morning. This would be a(n) _____.
A) observation
B) hypothesis
C) experiment
D) theory
E) all the above
Answer: A
Page Ref: 1.2
Learning Obj.: 1.2
Global Outcomes: G1 Demonstrate an understanding of the principles of scientific inquiry.

10) There is more traffic between 8 and 9 in the morning because most people start work at 9. This would be a(n) _____.
A) observation
B) hypothesis
C) experiment
D) theory
E) all the above
Answer: B
Page Ref: 1.2
Learning Obj.: 1.2
Global Outcomes: G1 Demonstrate an understanding of the principles of scientific inquiry.

11) One way to enhance your learning in chemistry is to _____.
A) study a little every day
B) retest every few days
C) go to office hours
D) study different ideas at the same time
E) all the above
Answer: E
Page Ref: 1.3
Learning Obj.: 1.3
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

12) In order to enhance your learning in chemistry, you should not _____.
A) study a little every day
B) form a study group
C) go to office hours
D) retest every few days
E) wait until the night before the exam to study
Answer: E
Page Ref: 1.3
Learning Obj.: 1.3
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

13) In the number 12.345, the 4 is in the _____ place.
A) tens
B) ones
C) tenths
D) hundredths
E) thousandths
Answer: D
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

14) In the number 12.345, the 1 is in the _____ place.
A) tens
B) ones
C) tenths
D) hundredths
E) thousandths
Answer: A
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

15) In the number 12.345, the 3 is in the _____ place.
A) tens
B) ones
C) tenths
D) hundredths
E) thousandths
Answer: C
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

16) The product of (-4) × (-5) is _____.
A) -20
B) +20
C) -1
D) +1
E) 0
Answer: B
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

17) For the equation 4 x (-3)/-2 = _____.
A) -6
B) +6
C) -12
D) +12
E) 4
Answer: B
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

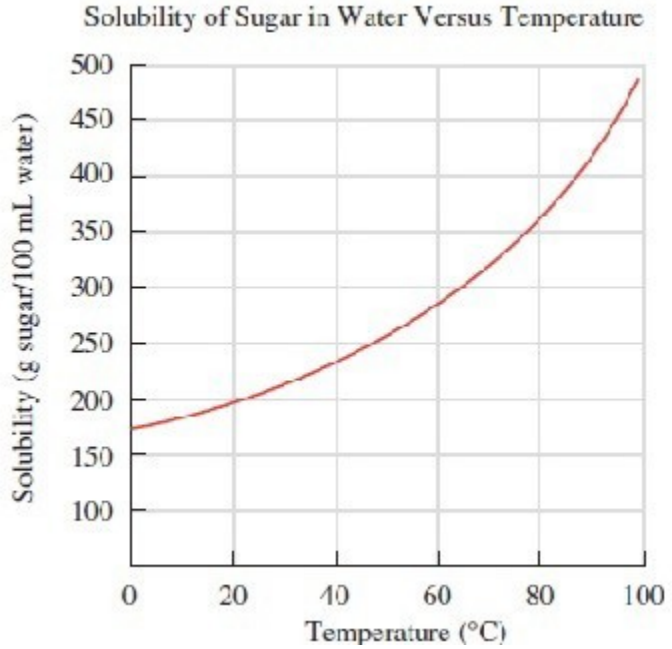
18) For the equation 4x + 2 = 10, x equals _____.
A) 8
B) 12
C) 3
D) 2
E) -2
Answer: D
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

19) For the equation 2x +14 = -2, x equals _____.
A) 8
B) -8
C) 16
D) -16
E) 6
Answer: B
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

20) For the equation -10 - (-4) = _____.
A) 6
B) -6
C) 14
D) -14
E) 4
Answer: B
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

21) 12 is what percent of 36?
A) 3%
B) 30%
C) 33%
D) 330%
E) 12%
Answer: C
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

22) Use the graph to estimate the solubility of sugar in 100 mL of water at 30 °C.



A) 150 g
B) 200 g
C) 215 g
D) 255 g
E) 325 g
Answer: C
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

23) Write 540 000 in scientific notation.
A) 0.54×10^{6}
B) 54×10^{8}
C) 5.4×10^{-5}
D) 5.4×10^{5}
E) 5.4
Answer: D
Page Ref: 1.5
Learning Obj.: 1.5
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

24) Write 0.000 000 33 in scientific notation.
A) 3.3×10^{7}
B) 3.3×10^{-7}
C) 3.3×10^{-8}
D) 3.3×10^{8}
E) 3.3
Answer: B
Page Ref: 1.5
Learning Obj.: 1.5
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

25) The measurement 0.000 004 3 m, expressed correctly using scientific notation, is _____.
A) 4.3×10^{-7} m
B) 4.3×10^{-6} m
C) 4.3×10^{6} m
D) 0.43×10^{-5} m
E) 4.3 m
Answer: B
Page Ref: 1.5
Learning Obj.: 1.5
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

1.2 Short Answer Questions

1) A substance that consists of one type of matter and always has the same composition and properties is called a _____.
Answer: chemical
Page Ref: 1.1
Learning Obj.: 1.1
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

2) Any material used in or produced by a chemical reaction is a _____.
Answer: chemical
Page Ref: 1.1
Learning Obj.: 1.1
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

3) An abrasive used in toothpaste is _____.
Answer: calcium carbonate
Page Ref: 1.1
Learning Obj.: 1.1
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

4) The substances released when tissues are injured are _____.
Answer: prostaglandins
Page Ref: 1.1
Learning Obj.: 1.1
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

5) The chemical used to make cans and foil is _____.
Answer: aluminum
Page Ref: 1.1
Learning Obj.: 1.1
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

6) The first step in the scientific method is to _____.
Answer: make observations
Page Ref: 1.2
Learning Obj.: 1.2
Global Outcomes: G1 Demonstrate an understanding of the principles of scientific inquiry.

7) A procedure that tests a hypothesis is a(an) _____.
Answer: experiment
Page Ref: 1.2
Learning Obj.: 1.2
Global Outcomes: G1 Demonstrate an understanding of the principles of scientific inquiry.

8) A product of -6/-2 = _____.
Answer: 3
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G1 Demonstrate an understanding of the principles of scientific inquiry.

9) Evaluate -12 - (-17) = _____.
Answer: 5
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G1 Demonstrate an understanding of the principles of scientific inquiry.

10) Friday, a store sold 10 blue shirts and 20 white shirts. What percentage of the shirts sold were blue? Give answer to the ones place.
Answer: 33%
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G1 Demonstrate an understanding of the principles of scientific inquiry.

11) Solve for x: $3x + 8 = -7$
Answer: -5
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G1 Demonstrate an understanding of the principles of scientific inquiry.

Express each of the following numbers using scientific notation.

12) 351 000 000 000
Answer: 3.51×10^{11}
Page Ref: 1.5
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

13) 0.000 860
Answer: 8.60×10^{-4}
Page Ref: 1.5
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

14) 5 207 000
Answer: 5.207×10^{6}
Page Ref: 1.5
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

15) 0.000 000 050
Answer: 5.0×10^{-8}
Page Ref: 1.5
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

1.3 True/False Questions

1) Titanium dioxide in toothpaste is used as a detergent.
Answer: FALSE
Page Ref: 1.1
Learning Obj.: 1.1
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

2) Calcium carbonate is used to sweeten toothpaste.
Answer: FALSE
Page Ref: 1.1
Learning Obj.: 1.1
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

3) Paracelsus was a Greek philosopher.
Answer: FALSE
Page Ref: 1.2
Learning Obj.: 1.2
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

4) The first step in the scientific method is to draw a conclusion.
Answer: FALSE
Page Ref: 1.2
Learning Obj.: 1.2
Global Outcomes: G1 Demonstrate an understanding of the principles of scientific inquiry.

5) Working with a group of students can help you learn chemistry.
Answer: TRUE
Page Ref: 1.3
Learning Obj.: 1.3
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

6) It is a good idea to wait until the night before an exam to start to study.
Answer: FALSE
Page Ref: 1.3
Learning Obj.: 1.3
Global Outcomes: G7 Demonstrate the ability to make connections between concepts across chemistry.

7) In the number 123.45, the digit 5 is in the hundreds place.
Answer: FALSE
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

8) If a negative number is divided by another negative number, the answer will be a positive number.
Answer: TRUE
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

9) $2x + 9 = -3$, $x = 3$
Answer: FALSE
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

10) -2 x 6 /-3 = 4
Answer: TRUE
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

11) An animal shelter has 12 dogs and 8 cats. Cats are 40% of the animals.
Answer: TRUE
Page Ref: 1.4
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.

12) 4300 expressed in scientific notation is 4.3×10^{-2}.
Answer: FALSE
Page Ref: 1.5
Learning Obj.: 1.4
Global Outcomes: G4 Demonstrate the quantitative skills needed to succeed in chemistry.