***Basic Chemistry, 5e* (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
Objective: 1.1
Global: G2

2) In this list, which substance can be classified as a chemical?
A) salt
B) sleep
C) cold
D) heat
E) temperature
Answer: A
Objective: 1.1
Global: G2

3) One example of a chemical used in toothpaste is _____.
A) chlorine
B) sulfur
C) carbon dioxide
D) calcium carbonate
E) sugar
Answer: D
Objective: 1.1
Global: G2

4) Which of the following is NOT a chemical?
A) salt
B) water
C) light
D) carbon dioxide
E) sugar
Answer: C
Objective: 1.1
Global: G2

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
Objective: 1.1
Global: G2

6) Methyl salicylate is a chemical used in toothpaste to _____.
A) make the paste white
B) disinfect the toothbrush
C) keep the paste from spoiling
D) give a pleasant flavor
E) strengthen tooth enamel
Answer: D
Objective: 1.1
Global: GO2

7) 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
Objective: 1.1
Global: G2

8) Which of the following is a chemical?
A) sugar
B) heat
C) light
D) noise
E) a wave
Answer: A
Objective: 1.1
Global: GO2

9) The production of smog from the chemical NO requires _____.
A) nitrogen
B) chlorine
C) water
D) oxygen
E) CFCs
Answer: D
Objective: 1.1
Global: G2

10) 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
Objective: 1.1
Global: G2

11) Which of the following is NOT a chemical?
A) sugar
B) salt
C) oxygen
D) noise
E) gold
Answer: D
Objective: 1.1
Global: G2

12) The first step in the scientific method is _____.
A) using technology
B) making observations
C) forming a hypothesis
D) doing experiments
E) proposing a theory
Answer: B
Objective: 1.2
Global: G1

13) 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
Objective: 1.2
Global: G1

14) 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
Objective: 1.2
Global: G1

15) 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) be an active learner
E) wait until the night before the exam to study
Answer: E
Objective: 1.3
Global: G2

16) One way to enhance your learning in chemistry is to _____.
A) study a little every day
B) form a study group
C) go to office hours
D) be an active learner
E) all the above
Answer: E
Objective: 1.3
Global: G2

17) In the number 12.345, the 4 is in the _____ place.
A) tens
B) ones
C) tenths
D) hundredths
E) thousandths
Answer: D
Objective: 1.4
Global: G4

18) In the number 12.345, the 1 is in the _____ place.
A) tens
B) ones
C) tenths
D) hundredths
E) thousandths
Answer: A
Objective: 1.4
Global: G4

19) The product of (-4) × (-5) is _____.
A) -20
B) +20
C) -1
D) +1
E) 0
Answer: B
Objective: 1.4
Global: G4

20) For the equation 4x + 2 = 10, x equals _____.
A) 8
B) 12
C) 3
D) 2
E) -2
Answer: D
Objective: 1.4
Global: G4

21) 12 is what percent of 36?
A) 3%
B) 30%
C) 33%
D) 330%
E) 12%
Answer: C
Objective: 1.4
Global: G4

22) Written in scientific notation, 540 000 is _____.
A) 0.54×10^{6}
B) 54×10^{8}
C) 5.4×10^{-5}
D) 5.4×10^{5}
E) 5.4
Answer: D
Objective: 1.5
Global: G4

23) Written in scientific notation, 8300 is _____.
A) 8.3×10^{2}
B) 8.3×10^{3}
C) 8.3×10^{4}
D) 8.3×10^{-3}
E) 8.3×10^{-2}
Answer: B
Objective: 1.5
Global: G4

24) Written in scientific notation, 0.000 000 33 is _____.
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
Objective: 1.5
Global: G4

25) Written in scientific notation, 0.000 004 03 is _____.
A) 4.03×10^{-7}
B) 4.03×10^{-6}
C) 4.03×10^{6}
D) 0.403×10^{-5}
E) 4.03
Answer: B
Objective: 1.5
Global: G4

1.2 True/False Questions

1) The reddish-brown color of smog is due to NO_2.
Answer: TRUE
Objective: 1.1
Global: G2

2) Methyl salicylate is used in toothpaste as an abrasive.
Answer: FALSE
Objective: 1.1
Global: G2

3) Titanium dioxide in toothpaste is used to give toothpaste a pleasant flavor.
Answer: FALSE
Objective: 1.1
Global: G2

4) General chemistry is the study of the composition, properties, and reactions of matter.
Answer: TRUE
Objective: 1.1
Global: G2

5) Organic chemistry is the study of substances that contain carbon.
Answer: TRUE
Objective: 1.1
Global: G2

6) Geochemistry is the study of the chemical reactions that take place in the body.
Answer: FALSE
Objective: 1.1
Global: G2

7) The first step in using the scientific method is usually the observation of some natural event.
Answer: TRUE
Objective: 1.2
Global: G1

8) In the scientific method, a hypothesis has more data to support it than a theory.
Answer: FALSE
Objective: 1.2
Global: G1

9) A theory is confirmed after one experiment is performed.
Answer: FALSE
Objective: 1.2
Global: G1

10) Working with a group of students can help you learn chemistry.
Answer: TRUE
Objective: 1.3
Global: G2

11) It is best to study only the night before an exam.
Answer: FALSE
Objective: 1.3
Global: G2

12) When -5 is added to -3, the answer is 8.
Answer: FALSE
Objective: 1.4
Global: G4

13) When -5 is multiplied by -3, the answer is 15.
Answer: TRUE
Objective: 1.4
Global: G4

14) (-8) - (4) is -12.
Answer: TRUE
Objective: 1.4
Global: G4

15) (-8) - (-4) is -12.
Answer: FALSE
Objective: 1.4
Global: G4

16) If $2x + 2 = 8$, x is 5.
Answer: FALSE
Objective: 1.4
Global: G4

17) In the number 123.45, the digit 5 is in the hundreds place.
Answer: FALSE
Objective: 1.4
Global: G4

18) When -7 is added to -5 the answer is 12.
Answer: FALSE
Objective: 1.4
Global: G4

19) If a negative number is divided by another negative number, the answer will be a positive number.
Answer: TRUE
Objective: 1.4
Global: G4

20) 3.5×10^{3} is equal to 3500.
Answer: TRUE
Objective: 1.5
Global: G4

21) 2.25×10^{-4} is equal to 22500.
Answer: FALSE
Objective: 1.5
Global: G4

1.3 Short Answer Questions

1) A type of matter that has the same composition and properties wherever it is found is a(n) _____.
Answer: chemical
Objective: 1.1
Global: G2

2) The brown color of smog is caused by _____.
Answer: nitrogen dioxide
Objective: 1.1
Global: G2

3) The substances released when tissues are injured are _____.
Answer: prostaglandins
Objective: 1.1
Global: G2

4) Substances which prevent spoilage are called _____.
Answer: antioxidants
Objective: 1.1
Global: G2

5) An abrasive used in toothpaste is _____.
Answer: calcium carbonate
Objective: 1.1
Global: G2

6) Any material used in or produced by a chemical reaction is a(n) _____.
Answer: chemical
Objective: 1.1
Global: G2

7) The science that studies the properties and composition of substances is called _____.
Answer: chemistry
Objective: 1.1
Global: G2

8) The use of observation and hypothesis are important steps in the _____ method.
Answer: scientific
Objective: 1.2
Global: G1

9) A test performed to determine if a hypothesis is valid is called a(n) _____.
Answer: experiment
Objective: 1.2
Global: G1

10) A hypothesis can be tested by performing a(n) _____.
Answer: experiment
Objective: 1.2
Global: G1

11) An observation takes place when a(n) _____ is noted.
Answer: natural phenomenon
Objective: 1.2
Global: G1

12) Name the steps in the scientific method.
Answer: observation, hypothesis, experiment, theory
Objective: 1.2
Global: G1

13) When a hypothesis is supported by many experiments is becomes a(n) _____.
Answer: theory
Objective: 1.2
Global: G1

14) In the scientific method, after data is collected, a(n) _____ is proposed which gives a possible explanation.
Answer: hypothesis
Objective: 1.2
Global: G1

15) In the number 34.56, the 4 is in the _____ place.
Answer: ones
Objective: 1.4
Global: G4

16) When two negative numbers are added, the answer is _____.
Answer: negative
Objective: 1.4
Global: G4

17) When two positive numbers are added, the answer is _____.
Answer: positive
Objective: 1.4
Global: G4

18) In the number 45.678, the digit 6 is in the _____ place.
Answer: tenths
Objective: 1.4
Global: GO2

Express each of the following numbers using scientific notation.

19) 351 000 000 000
Answer: 3.51×10^{11}
Objective: 1.5
Global: G5

20) 0.000 860
Answer: 8.60×10^{-4}
Objective: 1.5
Global: G5

21) 5 207 000
Answer: 5.207×10^{6}
Objective: 1.5
Global: G5

22) 0.000 000 050
Answer: 5.0×10^{-8}
Objective: 1.5
Global: G5