

## CHAPTER 1: BASIC CONCEPTS ABOUT MATTER

### MULTIPLE CHOICE

- 1) Which of the following is a property of both gases and liquids?
- a) definite shape
  - b) indefinite shape
  - c) definite volume
  - d) indefinite volume

ANS: B                      DIF: Easy                      KEY: Chemistry | general chemistry | phases  
NOT: Section 1.2

- 2) In which of the following pairs of properties are both properties *chemical* properties?
- a) freezes at 10°C and nonflammable
  - b) decomposes at 500°C and reacts with bromine
  - c) poor conductor of heat and is reddish brown in color
  - d) has a low density and is very hard

ANS: B                      DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | properties | chemical  
NOT: Section 1.3

- 3) When a substance undergoes a *chemical* change it is always true that
- a) it liquifies
  - b) it changes from a solid to a gas
  - c) it is converted to a new kind of matter with a different composition
  - d) the temperature of the substance increases

ANS: C                      DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | chemical change  
NOT: Section 1.4

- 4) The description “two substances present, two phases present” is correct for
- a) heterogeneous mixtures
  - b) homogeneous mixtures
  - c) elements
  - d) compounds

ANS: A                      DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | mixtures  
NOT: Section 1.5

- 5) Which of the following statements about heterogeneous and homogeneous mixtures is *correct*?
- a) It is possible to have heterogeneous mixtures in which all the components are liquids.
  - b) A homogeneous mixture contains visibly different parts, or phases.
  - c) All of the phases in a heterogeneous mixture must be in the same state.
  - d) No two phases in a heterogeneous mixture can be in the same state.

ANS: A                      DIF: Moderate                      KEY: Chemistry | general chemistry | mixtures  
NOT: Section 1.5

- 6) Which of the following statements is *correct*?
- Elements, but not compounds, are pure substances.
  - Compounds, but not elements, are pure substances.
  - Both elements and compounds are pure substances.
  - Neither elements nor compounds are pure substances.

ANS: C

DIF: Moderate

KEY: Chemistry | general chemistry | general concepts | pure substances

NOT: Section 1.6

- 7) An element is a substance that
- can be broken down into simpler substances by physical means.
  - cannot be broken down into simpler substances by physical means.
  - can be broken down into simpler substances by chemical means.
  - cannot be broken down into simpler substances by chemical or physical means.

ANS: D

DIF: Easy

KEY: Chemistry | general chemistry | general concepts | element

NOT: Section 1.6

- 8) A pure substance F is found to change upon heating into two new pure substances M and Y. Both M and Y may be decomposed by chemical means. From this we may conclude that:
- F is an element, M and Y are compounds.
  - F is a compound, M and Y are elements.
  - F, M and Y are all elements.
  - F, M and Y are all compounds.

ANS: D

DIF: Difficult

KEY: Chemistry | general chemistry | general concepts | compound; element; mixtures

NOT: Section 1.5| Section 1.6

- 9) Which of the following statements concerning the known elements is *correct*?
- No new elements have been identified within the last 40 years.
  - Most elements occur naturally.
  - 108 elements are known at present
  - Scientists have synthesized all possible non-natural elements.

ANS: B

DIF: Easy

KEY: Chemistry | general chemistry | elements

NOT: Section 1.7

- 10) The most abundant elements in the universe and the Earth's crust are, respectively,
- oxygen and iron.
  - hydrogen and helium.
  - helium and carbon.
  - hydrogen and oxygen.

ANS: D

DIF: Moderate

KEY: Chemistry | general chemistry | general concepts | element

NOT: Section 1.7

- 11) In which of the following sequences of elements does each of the elements have a two-letter chemical symbol?
- barium, iron, nitrogen
  - selenium, nickel, strontium
  - silicon, zinc, hydrogen
  - iodine, xenon, titanium



ANS: C                    DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | compound; element; mixtures  
NOT: Section 1.5

- 18) Consider the chemical formulas  $\text{CoI}_2$  and  $\text{COI}_2$ . It is true that they
- contain identical kinds of atoms
  - identify the same compound
  - contain different kinds and numbers of atoms
  - can be described by none of the above

ANS: C                    DIF: Moderate            KEY: Chemistry | general chemistry | chemical formulas  
NOT: Section 1.10

- 19) In which of the following pairs of chemical formulas do the two members of the pair contain the same number of elements as well as the same number of atoms?
- |  |   |
|--|---|
| a) Cs and CS                           | c) $\text{CoCl}_2$ and $\text{CoCl}_3$        |
| b) $\text{CoBr}_2$ and $\text{COBr}_2$ | d) $\text{NH}_4\text{Br}$ and $\text{NiSO}_4$ |

ANS: D                    DIF: Moderate            KEY: Chemistry | general chemistry | chemical formulas  
NOT: Section 1.10

- 20) The total number of atoms present in one formula unit of  $\text{Co}_2(\text{SO}_4)_3$  is
- |       |       |
|-------|-------|
| a) 14 | c) 16 |
| b) 15 | d) 17 |

ANS: D                    DIF: Moderate            KEY: Chemistry | general chemistry | chemical formulas  
NOT: Section 1.10

- 21) Which of the following is a property of both the liquid state and the solid state?
- a definite shape
  - an indefinite volume
  - an indefinite shape and a definite volume
  - more than one correct response
  - no correct response

ANS: E                    DIF: Easy                    KEY: Chemistry | general chemistry | phases  
NOT: Section 1.2

- 22) In which of the following pairs of properties are both properties *physical* properties?
- melts at  $73^\circ\text{C}$ , decomposes upon heating
  - good reflector of light, blue in color
  - has a high density, is very hard
  - more than one correct response
  - no correct response

ANS: D                    DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | properties  
NOT: Section 1.3

23) Which of the following changes is a *chemical* change?

- a) melting of ice
- b) pulverizing of hard sugar cubes
- c) rusting of iron
- d) more than one correct response
- e) no correct response

ANS: C                      DIF: Moderate

KEY: Chemistry | general chemistry | general concepts | chemical change

NOT: Section 1.4

24) The description “two substances present, two phases present” is *correct* for

- a) a mixture of ice and water
- b) a mixture of oil and water
- c) a mixture of milk and water
- d) more than one correct response
- e) no correct response

ANS: B                      DIF: Moderate

KEY: Chemistry | general chemistry | general concepts | mixtures

NOT: Section 1.5

25) Which of the following statements concerning mixtures is *correct*?

- a) The composition of a homogeneous mixture cannot vary.
- b) A homogeneous mixture can have components present in two physical states.
- c) A heterogeneous mixture containing only one phase is an impossibility.
- d) More than one correct response
- e) No correct response

ANS: C                      DIF: Moderate

KEY: Chemistry | general chemistry | general concepts | mixtures

NOT: Section 1.5

26) Which of the following statements concerning pure substances is *correct*?

- a) Elements, but not compounds, are pure substances.
- b) A pure substance can never be separated into simpler pure substances using chemical means.
- c) Pure substances cannot have a variable composition.
- d) more than one correct response
- e) no correct response

ANS: C                      DIF: Moderate

KEY: Chemistry | general chemistry | general concepts | pure substances

NOT: Section 1.6

27) A substance that cannot be separated into two or more substances using physical means

- a) must be an element.
- b) could be a compound.
- c) must be a pure substance.
- d) more than one correct response
- e) no correct response

ANS: D                    DIF: Easy  
KEY: Chemistry | general chemistry | general concepts | compound  
NOT: Section 1.6

- 28) When substance A reacts with substance B, a new substance C is formed. Based on this information
- Both A and B are elements.
  - B could be a compound.
  - C must be a compound.
  - More than one correct response.
  - No correct response.

ANS: D                    DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | compound; element  
NOT: Section 1.6

- 29) Which of the following statements about compounds and mixtures is *correct*?
- Both mixtures and compounds must contain two or more kinds of atoms.
  - Mixtures must always contain at least one compound.
  - Both mixtures and compounds can have a variable composition.
  - More than one correct response.
  - No correct response.

ANS: A                    DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | compound; mixtures  
NOT: Section 1.5| Section 1.6

- 30) Which of the following statements concerning elemental abundances in Earth's crust is *correct*?
- One element accounts for over one-half of all atoms present.
  - Silicon and aluminum are the two most abundant elements in terms of atom percent.
  - Elemental abundances in Earth's crust closely parallel elemental abundances in the universe as a whole.
  - More than one correct response.
  - No correct response.

ANS: A                    DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | element  
NOT: Section 1.7

- 31) In which of the following sequences of elements do all members of the sequence have chemical symbols starting with the same letter?
- sulfur, silicon, sodium
  - gold, silver, aluminum
  - potassium, phosphorus, lead
  - more than one correct response
  - no correct response

ANS: B                    DIF: Easy  
KEY: Chemistry | general chemistry | general concepts | element | nomenclature  
NOT: Section 1.8

- 32) Which of the following statements concerning the chemical symbols for the elements is *correct*?
- All chemical symbols start with the first letter of the element's English name.
  - Most elements have two-letter chemical symbols.
  - Synthetic elements have one-letter symbols and naturally-occurring elements have two-letter symbols.
  - More than one correct response.
  - No correct response.

ANS: B                      DIF: Easy

KEY: Chemistry | general chemistry | general concepts | element | nomenclature

NOT: Section 1.8

- 33) Which of the following pairings of terms/concepts is *correct*?
- atom; limit of physical subdivision
  - molecule; limit of chemical subdivision
  - compound; homoatomic molecule
  - more than one correct response
  - no correct response

ANS: E                      DIF: Moderate              KEY: Chemistry | general chemistry | general concepts

NOT: Section 1.9

- 34) In which of the following pairs of chemical formulas do both members of the pair have the same number of atoms per molecule?
- NaSCN and H<sub>2</sub>CO<sub>3</sub>
  - CoCl<sub>2</sub> and COCl<sub>2</sub>
  - H<sub>3</sub>N and NH<sub>3</sub>
  - more than one correct response
  - no correct response

ANS: C                      DIF: Easy

KEY: Chemistry | general chemistry | chemical formulas

NOT: Section 1.10

- 35) In which of the following sequences of chemical formulas do all members of the sequence fit the description "heteroatomic and triatomic"?
- HCN, H<sub>2</sub>O and O<sub>3</sub>
  - CO<sub>2</sub>, NO<sub>2</sub> and N<sub>2</sub>O
  - S<sub>2</sub>O, SO<sub>2</sub>, and SO<sub>3</sub>
  - more than one correct response
  - no correct response

ANS: B                      DIF: Easy

KEY: Chemistry | general chemistry | chemical formulas

NOT: Section 1.10

Use the following to answer the questions below:

In each of the following multiple-choice questions, characterize EACH of the three given statements as being TRUE or FALSE and then indicate the collective true-false status of the statements using the choices.

- All three statements are true.
- Two of the three statements are true.
- Only one of the statements is true.
- None of the statements is true.

- 36) Statements:
- (1) No more than two visibly distinct phases may be present in a homogeneous mixture.
  - (2) Elements are chemically rather than physically combined in a compound.
  - (3) A common characteristic for both solids and liquids is a definite volume.
- a) All three statements are true.
  - b) Two of the three statements are true.
  - c) Only one of the statements is true.
  - d) None of the statements is true.

ANS: B                      DIF: Moderate

KEY: Chemistry | general chemistry | general concepts | element; mixtures

NOT: Section 1.2| Section 1.5| Section 1.6

- 37) Statements:
- (1) The determination of a physical property of a substance causes no change in the identity of the substance.
  - (2) Matter is anything that has mass, occupies space, and can be seen by the naked eye.
  - (3) The two most abundant elements in the Earth's crust are oxygen and carbon.
- a) All three statements are true.
  - b) Two of the three statements are true.
  - c) Only one of the statements is true.
  - d) None of the statements is true.

ANS: C                      DIF: Moderate

KEY: Chemistry | general chemistry | general concepts | element; properties

NOT: Section 1.10| Section 1.3| Section 1.7

- 38) Statements:
- (1) A basis for distinguishing between an element and a compound is whether the substance can be decomposed into other substances using chemical means.
  - (2) Current chemical theory strongly suggests that all naturally occurring elements have been identified.
  - (3) The elements silver, gold, and aluminum all have chemical symbols that start with the letter A.
- a) All three statements are true.
  - b) Two of the three statements are true.
  - c) Only one of the statements is true.
  - d) None of the statements is true.

ANS: A                      DIF: Moderate

KEY: Chemistry | general chemistry | general concepts | element; pure substances | nomenclature

NOT: Section 1.6| Section 1.7| Section 1.8

- 39) Statements:
- (1) The first letter in a chemical symbol is always the same as the first letter in the element's name.
  - (2) Two element's account for over 75 percent of the atoms in the Earth's crust.
  - (3) The limit of chemical subdivision for a compound is a molecule.

- a) All three statements are true.
- b) Two of the three statements are true.
- c) Only one of the statements is true.
- d) None of the statements is true.

ANS: B                      DIF: Moderate

KEY: Chemistry | general chemistry | general concepts | compound; element | nomenclature

NOT: Section 1.7 | Section 1.8 | Section 1.9

40) Statements:

(1) The classification “triatomic molecule” denotes molecules in which three different elements are present.

(2) Common physical properties for a substance include color, melting point, boiling point, flammability, and hardness.

(3) The chemical formulas  $\text{HN}_3$  and  $\text{NH}_3$  represent two ways for denoting the same compound.

- a) All three statements are true.
- b) Two of the three statements are true.
- c) Only one of the statements is true.
- d) None of the statements is true.

ANS: D                      DIF: Moderate

KEY: Chemistry | general chemistry | chemical formulas; general concepts | properties

NOT: Section 1.10 | Section 1.3

41) Statements:

(1) A molecule is a group of two or more atoms that functions as a unit because the atoms are bound together by chemical forces.

(2) The crushing of ice to make ice chips is a physical procedure that involves a chemical change.

(3) Most naturally occurring samples of matter are mixtures rather than pure substances.

- a) All three statements are true.
- b) Two of the three statements are true.
- c) Only one of the statements is true.
- d) None of the statements is true.

ANS: B                      DIF: Easy

KEY: Chemistry | general chemistry | general concepts | chemical change; mixtures; molecule; physical change

NOT: Section 1.4 | Section 1.5 | Section 1.9

42) Statements:

(1) When the formula for a compound contains parentheses it is an indication that the compound is unstable and subject to decomposition.

(2) The fact that an unknown substance reacts with chlorine is insufficient basis for classifying the unknown as a compound.

(3) All chemical symbols use a two-letter notation to represent the name of an element.

- a) All three statements are true.
- b) Two of the three statements are true.
- c) Only one of the statements is true.
- d) None of the statements is true.

ANS: C                    DIF: Moderate  
KEY: Chemistry | general chemistry | chemical formulas; general concepts  
NOT: Section 1.10| Section 1.5| Section 1.6| Section 1.8

43) Statements:

- (1) Temperature and pressure are the only major factors that determine the state of matter (solid, liquid, gas) observed for a particular substance.
- (2) The components of a mixture maintain their identity if the mixture is heterogeneous but lose their identity if the mixture is homogeneous.
- (3) No more than six atoms may be present in a heteroatomic molecule.

- a) All three statements are true.
- b) Two of the three statements are true.
- c) Only one of the statements is true.
- d) None of the statements is true.

ANS: D                    DIF: Moderate  
KEY: Chemistry | general chemistry | chemical formulas; mixtures; phases  
NOT: Section 1.10| Section 1.2| Section 1.5

44) Statements:

- (1) A compound must always contain two or more types of atoms.
- (2) The description “one substance present, two phases present, all molecules are homoatomic” is consistent with a sample that is an element.
- (3) The number of known elements is less than one hundred.

- a) All three statements are true.
- b) Two of the three statements are true.
- c) Only one of the statements is true.
- d) None of the statements is true.

ANS: B                    DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | compound; element; mixtures  
NOT: Section 1.5| Section 1.6| Section 1.7

45) Statements:

- (1) The isolation of the metal iron from its ores involves a series of high temperature reactions in which carbon monoxide is one of the reactants.
- (2) Carbohydrates, fats, and proteins all contain the elements hydrogen, oxygen, and carbon.
- (3) Substances whose molecules are both diatomic and heteroatomic must be heterogeneous mixtures.

- a) All three statements are true.
- b) Two of the three statements are true.
- c) Only one of the statements is true.
- d) None of the statements is true.

ANS: B                    DIF: Moderate            KEY: Chemistry | general chemistry | chemical formulas  
NOT: Section chemical connections

- 46) For the elements calcium, iron, and beryllium; choose the appropriate characterization of the set's chemical symbols from the response list.
- a) All symbols have one letter.
  - b) All symbols have two letters.
  - c) All symbols start with the same letter.
  - d) All symbols start with a letter not the first letter of the element's English name.

ANS: B                      DIF: Easy

KEY: Chemistry | general chemistry | general concepts | element | nomenclature

NOT: Section 1.8

- 47) For the elements silver, sodium, and potassium; choose the appropriate characterization of the set's chemical symbols from the response list.
- a) All symbols have one letter.
  - b) All symbols have two letters.
  - c) All symbols start with the same letter.
  - d) All symbols start with a letter not the first letter of the element's English name.

ANS: D                      DIF: Easy

KEY: Chemistry | general chemistry | general concepts | element | nomenclature

NOT: Section 1.8

- 48) For the elements iodine, fluorine, and nitrogen; choose the appropriate characterization of the set's chemical symbols from the response list.
- a) All symbols have one letter.
  - b) All symbols have two letters.
  - c) All symbols start with the same letter.
  - d) All symbols start with a letter not the first letter of the element's English name.

ANS: A                      DIF: Easy

KEY: Chemistry | general chemistry | general concepts | element | nomenclature

NOT: Section 1.8

- 49) For the elements gold, lead, and bromine; choose the appropriate characterization of the set's chemical symbols from the response list.
- a) All symbols have one letter.
  - b) All symbols have two letters.
  - c) All symbols start with the same letter.
  - d) All symbols start with a letter not the first letter of the element's English name.

ANS: B                      DIF: Easy

KEY: Chemistry | general chemistry | general concepts | element | nomenclature

NOT: Section 1.8

- 50) For the elements silicon, sulfur, and tin; choose the appropriate characterization of the set's chemical symbols from the response list.
- a) All symbols have one letter.
  - b) All symbols have two letters.
  - c) All symbols start with the same letter.
  - d) All symbols start with a letter not the first letter of the element's English name.

ANS: C                    DIF: Easy  
KEY: Chemistry | general chemistry | general concepts | element | nomenclature  
NOT: Section 1.8

- 51) Give the classification of matter when two substances exist with three phases present.
- a) heterogeneous mixture
  - b) homogeneous mixture
  - c) compound
  - d) element

ANS: A                    DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | mixtures  
NOT: Section 1.5

- 52) Give the classification of matter when two substances exist with two phases present
- a) heterogeneous mixture
  - b) homogeneous mixture
  - c) compound
  - d) element

ANS: A                    DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | mixtures  
NOT: Section 1.5

- 53) Give the classification of matter when two substances exist with one phase present
- a) heterogeneous mixture
  - b) homogeneous mixture
  - c) compound
  - d) element

ANS: B                    DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | mixtures  
NOT: Section 1.5

- 54) Give the classification of matter when two substances exist with two phases present and the substance cannot be decomposed by chemical means
- a) heterogeneous mixture
  - b) homogeneous mixture
  - c) compound
  - d) element

ANS: D                    DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | mixtures  
NOT: Section 1.5

- 55) Give the classification of matter when two substances are present with heteroatomic molecules.
- a) heterogeneous mixture
  - b) homogeneous mixture
  - c) compound
  - d) element

ANS: C                    DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | mixtures  
NOT: Section 1.5

- 56) A substance is silvery-gray in color. Choose the appropriate classification from the response list below:
- a) could be an element or a compound
  - b) could be an element but not a compound
  - c) could be a compound but not an element
  - d) could not be an element nor a compound

ANS: A                    DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | compound; element  
NOT: Section 1.6

- 57) A substance decomposes upon heating. Choose the appropriate classification from the response list below:
- a) could be an element or a compound
  - b) could be an element but not a compound
  - c) could be a compound but not an element
  - d) could not be an element nor a compound

ANS: C                    DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | compound; element  
NOT: Section 1.6

- 58) A substance is composed of diatomic molecules. Choose the appropriate classification from the response list below:
- a) could be an element or a compound
  - b) could be an element but not a compound
  - c) could be a compound but not an element
  - d) could not be an element nor a compound

ANS: A                    DIF: Moderate      KEY: Chemistry | general chemistry | general concepts  
NOT: Section 1.9

- 59) A substance reacts vigorously with chlorine. Choose the appropriate classification from the response list below:
- a) could be an element or a compound
  - b) could be an element but not a compound
  - c) could be a compound but not an element
  - d) could not be an element nor a compound

ANS: A                    DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | compound; element  
NOT: Section 1.6

- 60) A substance has a variable composition. Choose the appropriate classification from the response list below:
- a) could be an element or a compound
  - b) could be an element but not a compound
  - c) could be a compound but not an element
  - d) could not be an element nor a compound

ANS: D                    DIF: Moderate  
KEY: Chemistry | general chemistry | general concepts | mixtures  
NOT: Section 1.5

- 61) A substance has a freezing point of  $-20^{\circ}\text{C}$ . This is an example of a:
- a) physical property
  - b) chemical property
  - c) physical change
  - d) chemical change

ANS: A                    DIF: Easy  
KEY: Chemistry | general chemistry | general concepts | properties  
NOT: Section 1.3

- 62) A substance is melted. Choose the appropriate classification from the response list below:
- could be an element or a compound
  - could be an element but not a compound
  - could be a compound but not an element
  - could not be an element nor a compound

ANS: C                      DIF: Easy

KEY: Chemistry | general chemistry | general concepts | physical change

NOT: Section 1.4

- 63) A substance has a high density. Choose the appropriate classification from the response list below:
- could be an element or a compound
  - could be an element but not a compound
  - could be a compound but not an element
  - could not be an element nor a compound

ANS: A                      DIF: Easy

KEY: Chemistry | general chemistry | general concepts | properties

NOT: Section 1.3

- 64) A substance will explode if exposed to light. The substance:
- could be an element or a compound
  - could be an element but not a compound
  - could be a compound but not an element
  - could not be an element nor a compound

ANS: B                      DIF: Moderate

KEY: Chemistry | general chemistry | general concepts | chemical change

NOT: Section 1.4

- 65) A substance is reacted with chlorine gas. The substance:
- could be an element or a compound
  - could be an element but not a compound
  - could be a compound but not an element
  - could not be an element nor a compound

ANS: D                      DIF: Moderate

KEY: Chemistry | general chemistry | general concepts | chemical change

NOT: Section 1.4

- 66) Which of the following substances is both homoatomic and tetraatomic?
- HCN
  - H<sub>2</sub>O<sub>2</sub>
  - P<sub>4</sub>
  - H<sub>2</sub>CO<sub>3</sub>

ANS: C                      DIF: Moderate

KEY: Chemistry | general chemistry | chemical formulas

NOT: Section 1.10

- 67) Which of the following substances is both heteroatomic and triatomic?
- HCN
  - H<sub>2</sub>O<sub>2</sub>
  - P<sub>4</sub>
  - H<sub>2</sub>CO<sub>3</sub>

ANS: A                      DIF: Moderate

KEY: Chemistry | general chemistry | chemical formulas

NOT: Section 1.10

68) Which of the following substances contains same number of elements as atoms?

- a) HCN  
b) H<sub>2</sub>O<sub>2</sub>  
c) P<sub>4</sub>  
d) H<sub>2</sub>CO<sub>3</sub>

ANS: A                      DIF: Easy                      KEY: Chemistry | general chemistry | chemical formulas  
NOT: Section 1.10

69) Which of the following substances contains fewer atoms of one kind than other kinds?

- a) HCN  
b) H<sub>2</sub>O<sub>2</sub>  
c) P<sub>4</sub>  
d) H<sub>2</sub>CO<sub>3</sub>

ANS: D                      DIF: Easy                      KEY: Chemistry | general chemistry | chemical formulas  
NOT: Section 1.10

70) Which of the following substances has the number of elements present and number of atoms present differ by a factor of two?

- a) HCN  
b) H<sub>2</sub>O<sub>2</sub>  
c) P<sub>4</sub>  
d) H<sub>2</sub>CO<sub>3</sub>

ANS: D                      DIF: Difficult                      KEY: Chemistry | general chemistry | chemical formulas  
NOT: Section 1.10