

Form A

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Which term does **not** describe a conversion between states of matter?
A) condensation B) evaporation C) melting D) freezing E) mixing
- 2) 1-butanethiol, one of the compounds giving skunks their distinctive odor, freezes at -115.7°C and boils at 98.5°C . What is its phase at 37°C , the normal body temperature of humans?
A) solid
B) gas
C) liquid
D) a mixture of solid and liquid
E) a mixture of liquid and gas
- 3) What is the chemical symbol for copper?
A) Ca B) Cu C) C D) Cl E) Cr
- 4) Which chemical symbol represents a metal?
A) C B) Ar C) Ag D) F E) B
- 5) Which value is closest to the amount of gasoline in a small car with a full tank (which contains about 13 gallons)(One gallon = 4 quarts)?
A) 3.5×10^2 dL B) 50 L C) $85 \mu\text{L}$ D) 450 mL E) 12 kL
- 6) Which measurement represents the **largest** quantity? (Convert all to grams.)
A) 4730 ng B) 47.3 mg C) $4.73 \times 10^3 \mu\text{g}$ D) 4.73×10^{-4} g E) 4.73×10^{-6} kg
- 7) What is the numerical value of $(8.0 \times 10^3)(2.0 \times 10^2)$?
A) 16.0 B) 1.6×10^1 C) 16×10^6 D) 1.6×10^5 E) 1.6×10^6
- 8) How many grams are contained in 1.20 pounds? (1 lb = 454 g)
A) 378 g B) 1.20 g C) 2.2 g D) 545 g E) 264 g
- 9) 95.0°F is the same as
A) 171°C . B) 85°C . C) 35°C . D) 21°C . E) 203°C .
- 10) What is the volume of a gold nugget that weighs 2.20 g? The density of gold is $19 \text{ g}/\text{cm}^3$.
A) 11.6 cm^3
B) $8.60 \times 10^3 \text{ cm}^3$
C) 116 cm^3
D) 0.116 cm^3
E) 8.60 cm^3

- 11) What is the specific heat of a metal if it takes 26.5 calories to raise the temperature of a piece weighing 50.0 g by 5.00 Celsius degrees?
A) 133 cal/g °C B) 1.89 cal/g °C C) 250 cal/g °C D) 0.106 cal/g °C E) 6.63 cal/g °C
- 12) Which characteristics correctly describe a proton?
A) approximate mass 1 amu; charge 0; inside nucleus
B) approximate mass 1 amu; charge +1; inside nucleus
C) approximate mass 1 amu; charge +1; outside nucleus
D) approximate mass 5×10^{-4} amu; charge -1; outside nucleus
E) approximate mass 5×10^{-4} amu; charge +1; inside nucleus
- 13) In a neutral atom the number of _____ is equal to the number of _____.
A) protons, neutrons
B) neutrons, electrons
C) protons, electrons
D) protons + electrons, neutrons
E) none of the above
- 14) An atom with a mass number of 58 and with 32 neutrons will have _____ protons.
A) 58 B) 90 C) 26 D) 32 E) 16
- 15) An atom with 31 protons and a mass number of 69 contains _____ protons and _____ neutrons.
A) 31; 38 B) 31; 100 C) 69; 31 D) 31; 69 E) 38; 31
- 16) Elements in the Periodic Table are arranged according to
A) alphabetical order.
B) date of discovery.
C) atomic weight.
D) number of neutrons.
E) atomic number.
- 17) Which of the following is an alkali metal?
A) He B) Na C) Cl D) Al E) O
- 18) The element which has two valence electrons is _____.
A) Na B) Mg C) S D) Si E) Cl
- 19) Which is the best description of an alpha particle?
A) charge +2; mass of 4 amu; low penetrating power
B) charge 0; mass of 0 amu; high penetrating power
C) charge -1; mass of 0 amu; high penetrating power
D) charge -1; mass of 0 amu; medium penetrating power
E) charge +2; mass of 4 amu; high penetrating power

- 20) Which product is formed by alpha emission from polonium-208? The atomic number of polonium is 84.
- A) ${}_{83}^{208}\text{Bi}$ B) ${}_{85}^{208}\text{At}$ C) ${}_{84}^{209}\text{Po}$ D) ${}_{86}^{212}\text{Rn}$ E) ${}_{82}^{204}\text{Pb}$
- 21) Which product is formed by beta emission from phosphorus-32? The atomic number of phosphorus is 15.
- A) ${}_{13}^{28}\text{Al}$ B) ${}_{15}^{33}\text{P}$ C) ${}_{15}^{32}\text{P}$ D) ${}_{13}^{30}\text{Al}$ E) ${}_{16}^{32}\text{S}$
- 22) The half-life of nickel-65 is 2.5 days. How much of a 100-g sample remains after 7.5 days?
- A) 12.5 g B) 100 g C) 6.25 g D) 50 g E) 25 g
- 23) A curie is
- A) the amount of radiation that produces 2.1×10^9 units of charge in one cubic centimeter of air.
 B) the amount of radioactive substance that undergoes 3.7×10^{10} disintegrations per second.
 C) a unit that allows both for the energy and the penetrating power of different types of radiation.
 D) the SI unit for radiation absorbed.
 E) a unit used to measure the amount of radiation absorbed per gram of tissue.
- 24) Main group elements that are metals usually _____ one or more electrons to form _____, which have a _____ charge.
- A) gain; anions; negative
 B) lose; cations; positive
 C) lose; cations; negative
 D) gain; cations; positive
 E) lose; anions; negative
- 25) Which pair of elements is most likely to form an ionic compound if allowed to react together?
- A) C and F B) H and N C) Fe and Ca D) Al and Si E) K and Br
- 26) The charge on a sulfide ion is _____.
- A) 0 B) 2- C) 3- D) 2+ E) 3+
- 27) The name of Cu^{2+} is _____ ion or _____ ion.
- A) copper; cupric
 B) copper(I); cupric
 C) copper(I); cuprous
 D) copper(II); cuprous
 E) copper(II); cupric
- 28) Which is the correct formula for the ionic compound containing iron(III) ions and oxide ions?
- A) FeO B) Fe₃O₂ C) Fe₂O₃ D) FeO₂ E) Fe₂O₂

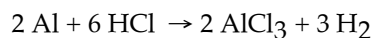
- 29) What is the name of $\text{Mg}_3(\text{PO}_4)_2$?
- A) magnesium phosphate
 - B) trimagnesium diphosphate
 - C) magnesium phosphorus oxide
 - D) magnesium diphosphate
 - E) trimagnesium phosphate
- 30) What is the systematic name of ICl_3 ?
- A) iodine chloride
 - B) triiodine chloride
 - C) iodine(III) chloride
 - D) tri(iodine chloride)
 - E) iodine trichloride
- 31) Which group contains only elements which normally exist as diatomic molecules?
- A) hydrogen, lithium, sodium
 - B) nitrogen, sulfur, bromine
 - C) oxygen, phosphorus, germanium
 - D) helium, neon, argon
 - E) nitrogen, oxygen, fluorine
- 32) Which element is most likely to form three covalent bonds?
- A) P B) Se C) Si D) C E) S
- 33) A molecule in which the central atom has two lone pairs and forms two single bonds is said to have a _____ shape.
- A) bent B) linear C) pyramidal D) tetrahedral E) planar
- 34) Which element listed is the **least** electronegative?
- A) hydrogen B) nitrogen C) oxygen D) fluorine E) chlorine
- 35) In a precipitation reaction the insoluble product can be identified by the symbol _____.
- A) (g)
 - B) (s)
 - C) (aq)
 - D) (l)
 - E) none of the above
- 36) When the reaction shown is correctly balanced, the coefficients are
- $$\text{KClO}_3 \rightarrow \text{KCl} + \text{O}_2$$
- A) 2, 2, 2 B) 1, 1, 1 C) 2, 2, 3 D) 2, 2, 1 E) 4, 4, 6

- 37) When aqueous ammonium sulfate and aqueous barium acetate are mixed a white precipitate forms. Which of the following is the correct equation for the reaction?
- A) $(\text{NH}_4)_2\text{SO}_4 (\text{aq}) + \text{Ba}(\text{C}_2\text{H}_3\text{O}_2)_2 (\text{aq}) \rightarrow \text{BaSO}_4 (\text{aq}) + 2 \text{NH}_4\text{C}_2\text{H}_3\text{O}_2 (\text{s})$.
- B) $(\text{NH}_4)_2\text{SO}_4 (\text{aq}) + \text{Ba}(\text{C}_2\text{H}_3\text{O}_2)_2 (\text{aq}) \rightarrow \text{BaSO}_4 (\text{s}) + \text{NH}_4\text{C}_2\text{H}_3\text{O}_2 (\text{aq})$.
- C) $(\text{NH}_4)_2\text{SO}_4 (\text{aq}) + \text{Ba}(\text{C}_2\text{H}_3\text{O}_2)_2 (\text{aq}) \rightarrow \text{BaSO}_4 (\text{s}) + 2 \text{NH}_4\text{C}_2\text{H}_3\text{O}_2 (\text{aq})$.
- D) $\text{NH}_4\text{SO}_4 (\text{aq}) + \text{BaC}_2\text{H}_3\text{O}_2 (\text{aq}) \rightarrow \text{BaSO}_4 (\text{s}) + \text{NH}_4\text{C}_2\text{H}_3\text{O}_2 (\text{aq})$.
- E) $(\text{NH}_4)_2\text{SO}_3 (\text{aq}) + \text{Ba}(\text{C}_2\text{H}_3\text{O}_2)_2 (\text{aq}) \rightarrow \text{BaSO}_3 (\text{aq}) + \text{NH}_4\text{C}_2\text{H}_3\text{O}_2 (\text{aq})$.

- 38) The formula weight of copper(II) chloride is _____ g.
- A) 162.5 B) 133.0 C) 98.9 D) 134.5 E) 197.8

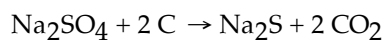
- 39) 105 g of MgCl_2 contains _____ mol MgCl_2 .
- A) 1.76 B) 105 C) 6.62×10^{23} D) 1.10 E) 1.06×10^{24}

- 40) In the reaction shown, how many moles of HCl are needed to react with 2.4 moles of Al?



- A) 1.3 B) 7.2 C) 4.8 D) 6.4 E) 0.8

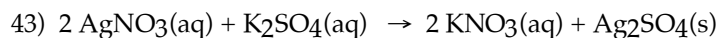
- 41) How many grams of C will be consumed when 5.00 grams of Na_2SO_4 react according to the balanced reaction shown?



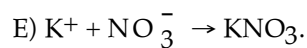
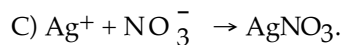
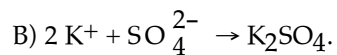
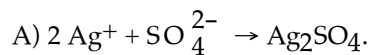
- A) 0.844 g B) 0.038 g C) 17.1 g D) 1.69 g E) 0.211 g

- 42) The combination of ions most likely to produce a precipitate is

- A) Na^+ and PO_4^{3-} .
- B) Mg^{2+} and $\text{C}_2\text{H}_3\text{O}_2^-$.
- C) Pb^{2+} and NO_3^- .
- D) NH_4^+ and SO_4^{2-} .
- E) Fe^{3+} and OH^- .



The net ionic reaction for the balanced equation shown above is



44) The oxidation number of iron in the compound FeBr_3 is _____.

A) -2

B) +1

C) -1

D) +3

E) +2

45) When a substance loses electrons it is _____; the substance itself is acting as a(an) _____ agent.

A) reduced, reducing

B) oxidized, oxidizing

C) reduced, oxidizing

D) dissolved, neutralizing

E) oxidized, reducing

Answer Key

Testname: 104_S09_E1A.TST

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) E
- 2) C
- 3) B
- 4) C
- 5) B
- 6) B
- 7) E
- 8) D
- 9) C
- 10) D
- 11) D
- 12) B
- 13) C
- 14) C
- 15) A
- 16) E
- 17) B
- 18) B
- 19) A
- 20) E
- 21) E
- 22) A
- 23) B
- 24) B
- 25) E
- 26) B
- 27) E
- 28) C
- 29) A
- 30) E
- 31) E
- 32) A
- 33) A
- 34) A
- 35) B
- 36) C
- 37) C
- 38) D
- 39) D
- 40) B
- 41) A
- 42) E
- 43) A
- 44) D
- 45) E