

**Multiple Choice**

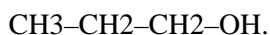
Identify the letter of the choice that best completes the statement or answers the question and place your selection ON THE ANSWER SHEET.

- In the cyclotron bombardment of  ${}_{13}^{27}\text{Al}$  with low energy alpha particles, one of the two reaction products is  ${}_{15}^{30}\text{P}$ . The other is
  - a proton.
  - a neutron.
  - a meson.
  - a neutrino.
  - a beta minus
- A compound of which halogen is used in etching glass?
  - astatine
  - iodine
  - bromine
  - chlorine
  - fluorine
- Equal volumes of all gases, under the same conditions of temperature and pressure, contain *very nearly* the same number of molecules. This is
  - Avogadro's Principle.
  - Boyle's Law.
  - Dalton's Law.
  - Gay-Lussac's Law.
  - Graham's Law.
- A 250 g piece of ice at 0.0 °C is placed in 200 g of water at 100 °C. The final temperature of the mixture formed is

Data for Water	
heat of fusion(ice)	335 J/g
specific heat(ice)	2.03 J/g°C
specific heat(water)	4.18 J/g°C

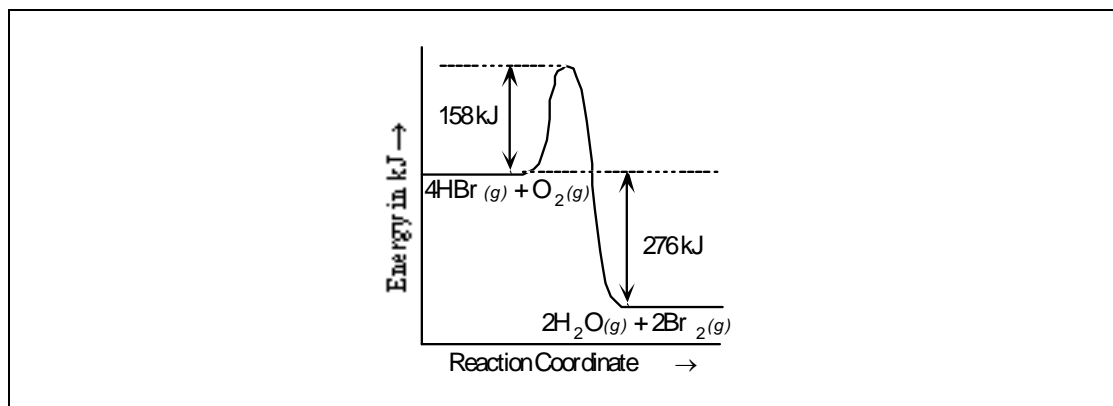
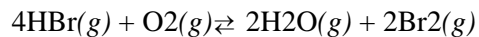
- 0.0 °C
  - 2.5 °C
  - 10 °C
  - 45 °C
  - 55 °C
- Determine the empirical formula of the compound with the following composition by mass:  
24.5% Na, 14.9% Si, 60.6% F
    - NaSiF
    - Na<sub>2</sub>Si<sub>2</sub>F<sub>3</sub>
    - Na<sub>2</sub>SiF<sub>6</sub>
    - Na<sub>3</sub>SiF<sub>4</sub>
    - Na<sub>2</sub>SiF<sub>2</sub>

6. Solutions of sodium carbonate and silver nitrate react to form solid silver carbonate and a solution of sodium nitrate. A solution containing 6.50 g of sodium carbonate is mixed with one containing 7.00 g of silver nitrate. How many grams of each reactant and product are present after the reaction is complete?
- A) 4.32 g sodium carbonate, 0.00 g silver nitrate, 5.68 g silver carbonate, 3.50 g sodium nitrate  
 B) 5.67 g sodium carbonate, 0.00 g silver nitrate, 3.22 g silver carbonate, 4.61 g sodium nitrate  
 C) 3.21 g sodium carbonate, 0.00 g silver nitrate, 6.14 g silver carbonate, 4.15 g sodium nitrate  
 D) 0.00 g sodium carbonate, 3.20 g silver nitrate, 7.33 g silver carbonate, 2.97 g sodium nitrate  
 E) 0.00 g sodium carbonate, 0.00 g silver nitrate, 5.68 g silver carbonate, 7.82 g sodium nitrate
7. A sample of  $\text{CH}_4$  gas weighs 6.022 g. It is placed in a 30.0 L vessel at  $130^\circ\text{C}$ . What is the pressure?
- A) 0.134 atm    B) 0.415 atm    C) 2.42 atm    D) 12.4 atm    E) 22.4 atm
8. Select the formula of the compound that is an isomer of:



- A)  $\text{CH}_3 - \text{CH}_2 - \text{OH}$
- B)  $\text{CH}_3 - \text{CH} - \text{CH}_3$   
           |  
           OH
- C)  $\begin{array}{c} \text{CH}_2 - \text{CH}_2 - \text{CH}_2 \\ | \qquad \qquad | \\ \text{OH} \qquad \qquad \text{OH} \end{array}$
- D)  $\text{CH}_3 - \text{O} - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$
- E)  $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$

9. Consider this reaction at 500 °C:



What is the activation energy for the *reverse* reaction?

- A) 118 kJ      B) 276 kJ      C) 158 kJ      D) 434 kJ      E) 552 kJ
10. The addition of a hydrogen ion to an ammonia molecule changes the shape of the molecule
- A) from bent to symmetric.  
B) from planar to pyramidal.  
C) from pyramidal to tetrahedral  
D) from pyramidal to square planar.  
E) from planar to tetrahedral
11. A certain solid does not dissolve in water, does not conduct electricity, and does not melt when heated to 1500° C. What type of bonding most likely exists between particles in its structure?
- A) ionic  
B) hydrogen  
C) metallic  
D) covalent network  
E) dipole forces
12. To make ice cream, a student used an ice/salt/water mixture to freeze the milk mixture. He added 146 g of NaCl to the mixing bucket containing 1.0 kg ice and 200mL water. When the ice cream was completely frozen there were still a few small pieces of ice in the salt water. What was the final temperature of the salt water mixture?
- A) 0.0°C      B) -3.9°C      C) -7.8°C      D) -9.3°C      E) -10.4°C

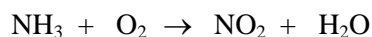
13. Given five beakers containing:

- (1) water solution of sodium chloride.
- (2) water solution of a sugar.
- (3) pure water.
- (4) water solution of silver nitrate.
- (5) water solution of methanol.

Which of these liquids are good conductors of electricity?

- A) 1, 2, 3, 4, 5
  - B) 1, 2, 3, 5
  - C) 1, 4
  - D) 2, 3, 5
  - E) 2, 5
14. A sample of He gas will effuse through a nylon screen in 33 s. The same amount of an unknown gas, under the same conditions, effused through the same screen in 165 s. What is the molar mass of the unknown gas?
- A) 5.5 g
  - B) 20 g
  - C) 88 g
  - D) 100g
  - E) 122 g
15. Which one of the following molecules or ions has trigonal planar molecular geometry?
- A)  $\text{SeCl}_3^+$
  - B)  $\text{NF}_3$
  - C)  $\text{SO}_3$
  - D)  $\text{XeO}_3$
  - E)  $\text{BrF}_3^{2+}$
16. For the  $\text{BrF}_3$  molecule, what is the Electron Domain Geometry and the Molecular Geometry?
- A) tetrahedral; trigonal planar
  - B) trigonal pyramidal ; trigonal pyramidal
  - C) octahedral; T-shaped
  - D) trigonal bipyramidal; T-shaped
  - E) tetrahedral; trigonal pyramidal
17. Which pair of elements would you expect to exhibit the greatest similarity in their physical and chemical properties?
- A) C, O
  - B) H, Li
  - C) Ca, Sr
  - D) Ga, Ge
  - E) Cs, Ba

18. When the following equation is correctly balanced, the sum of the product coefficients is:



- A) 2                      B) 3                      C) 7                      D) 10                      E) 21
19. A certain mass of carbon reacts with 13.6 g of oxygen to form carbon monoxide. How many grams of oxygen would react with that same mass of carbon to form carbon dioxide, according to the law of multiple proportions?
- A) 6.8 g  
B) 13.6 g  
C) 25.6 g  
D) 27.2 g  
E) 136 g
20. An equilibrium system shifts left when the temperature is increased. The forward reaction is
- A) exothermic and  $\Delta H$  is positive  
B) exothermic and  $\Delta H$  is negative  
C) endothermic and  $\Delta H$  is positive  
D) endothermic and  $\Delta H$  is negative  
E) exothermic and  $\Delta H$  is zero
21. A net ionic equation representing the reaction between 1.0 M  $\text{HNO}_2$  and 1.0 M  $\text{NaOH}$  is
- A)  $\text{Na}^+ + \text{NO}_2^- \rightarrow \text{NaNO}_2$   
B)  $\text{H}^+ + \text{NaOH} \rightarrow \text{Na}^+ + \text{H}_2\text{O}$   
C)  $\text{HNO}_2 + \text{OH}^- \rightarrow \text{NO}_2^- + \text{H}_2\text{O}$   
D)  $\text{HNO}_2 + \text{NaOH} \rightarrow \text{NaNO}_2 + \text{H}_2\text{O}$   
E)  $\text{H}^+ + \text{OH}^- \rightarrow \text{H}_2\text{O}$
22. **Eliminated** A solution is prepared by adding 10.0 mL of 0.10 M  $\text{HCl}$  to 25.0 mL of 0.40 M  $\text{NaOH}$ . The pH of the resulting solution is \_\_\_\_\_
- A) 1.00                      B) 3.20                      C) 7.00                      D) 10.15                      E) 11.95
23. The net ionic equation for the reaction between a sodium sulfide solution and an iron(II) nitrate solution is:
- A)  $\text{Na}_2\text{S}_{(\text{aq})} + \text{Fe}(\text{NO}_3)_2_{(\text{aq})} \rightarrow \text{FeS}_{(\text{s})} + 2\text{NaNO}_3_{(\text{aq})}$   
B)  $2\text{Na}^+_{(\text{aq})} + \text{S}^{2-}_{(\text{aq})} + \text{Fe}^{2+}_{(\text{aq})} + 2\text{NO}_3^-_{(\text{aq})} \rightarrow \text{Fe}^{2+}_{(\text{aq})} + \text{S}^{2-}_{(\text{aq})} + 2\text{Na}^+_{(\text{aq})} + 2\text{NO}_3^-_{(\text{aq})}$   
C)  $\text{Fe}^{2+}_{(\text{aq})} + \text{S}^{2-}_{(\text{aq})} \rightarrow \text{FeS}_{(\text{s})}$   
D)  $\text{Fe}^{2+}_{(\text{aq})} + \text{S}^{2-}_{(\text{aq})} \rightarrow \text{FeSO}_4_{(\text{s})}$   
E)  $\text{Fe}^{2+}_{(\text{aq})} + 2\text{Na}^+_{(\text{aq})} + \text{S}^{2-}_{(\text{aq})} \rightarrow \text{FeS}_{(\text{s})}$
24. The element "X" has the following ionization energies in kJ/mol

I.E.	kJ/mol
E <sub>1</sub>	1050
E <sub>2</sub>	2331
E <sub>3</sub>	3364
E <sub>4</sub>	5040
E <sub>5</sub>	26100

The number of valence electrons that "X" has is

- A) 5                      B) 4                      C) 3                      D) 2                      E) 1

25. Which of the following causes a precipitate to form when Sr<sup>2+</sup><sub>(aq)</sub> is added but not when Zn<sup>2+</sup><sub>(aq)</sub> is added?

- A) S<sup>2-</sup>  
 B) Cl<sup>-</sup>  
 C) SO<sub>4</sub><sup>2-</sup>  
 D) CO<sub>3</sub><sup>2-</sup>  
 E) NO<sub>3</sub><sup>-</sup>

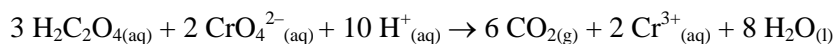
26. Consider the following buffer equilibrium:



What happens when a small amount of NaOH<sub>(aq)</sub> is added?

- A) [H<sub>3</sub>O<sup>+</sup>] increases, then the equilibrium shifts to the left.  
 B) [H<sub>3</sub>O<sup>+</sup>] decreases, then the equilibrium shifts to the left  
 C) [H<sub>3</sub>O<sup>+</sup>] increases, then the equilibrium shifts to the right  
 D) [H<sub>3</sub>O<sup>+</sup>] decreases, then the equilibrium shifts to the right  
 E) [H<sub>3</sub>O<sup>+</sup>] remains the same, there is no shift in equilibrium

27. Calculate the molarity of a H<sub>2</sub>C<sub>2</sub>O<sub>4</sub> solution if 20.0 mL of the H<sub>2</sub>C<sub>2</sub>O<sub>4</sub> reacts completely with 40.0 mL of a 0.25 M CrO<sub>4</sub><sup>2-</sup> solution.



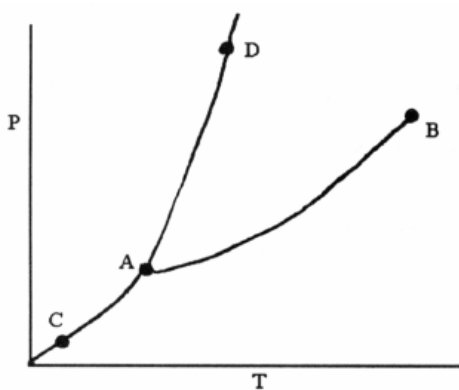
- A) 0.75 M  
 B) 0.50 M  
 C) 0.33 M  
 D) 0.19 M  
 E) 0.083 M

28. Based on molecular mass and dipole moment of the five compounds in the table below, which compound should have the highest boiling point?

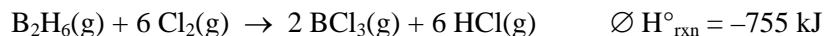
Substance	Molecular Mass (amu)	Dipole moment (D)
CH <sub>3</sub> CH <sub>2</sub> CH <sub>3</sub>	44	0.1
CH <sub>3</sub> OCH <sub>3</sub>	46	1.3
CH <sub>3</sub> Cl	50	1.9
CH <sub>3</sub> CHO	44	2.7
CH <sub>3</sub> CN	41	3.9

- A) CH<sub>3</sub>CH<sub>2</sub>CH<sub>3</sub>
- B) CH<sub>3</sub>OCH<sub>3</sub>
- C) CH<sub>3</sub>Cl
- D) CH<sub>3</sub>CHO
- E) CH<sub>3</sub>CN

29. On the phase diagram below, which segment corresponds to the conditions of temperature and pressure under which the solid and the gas of the substance are in equilibrium?



- A) BC
  - B) AB
  - C) AC
  - D) CD
  - E) AD
30. How much heat is released when 250 g of B<sub>2</sub>H<sub>6</sub> reacts with excess Cl<sub>2</sub> according to the reaction below?



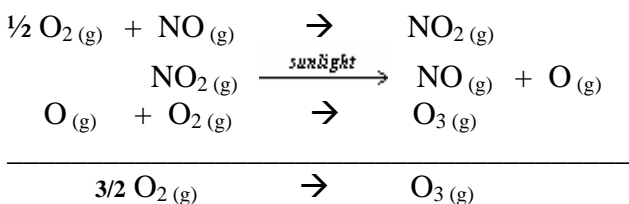
- A) - 83.5 kJ
  - B) -3420 kJ
  - C) - 6840 kJ
  - D) - 9440 kJ
  - E) - 189,000 kJ
31. Cobalt-60, used in cancer treatment, emits gamma rays of energy  $2.13 \times 10^{-13}$  J. What is the wavelength of this radiation?
- A)  $9.64 \times 10^{28}$  m
  - B)  $3.22 \times 10^{20}$  m

- C)  $1.07 \times 10^{12} \text{ m}$
- D)  $9.32 \times 10^{-13} \text{ m}$
- E)  $3.11 \times 10^{-21} \text{ m}$

32. Following the Aufbau principle, the electron configuration of  $\text{Zr}^{3+}$  in its ground-state would be written as:

- A)  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 4f^1$
- B)  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 4d^1$
- C)  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 5s^1$
- D)  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 5s^2$
- E)  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4p^6 5s^2 5p^6 6s^2 6p^1$

33. The following series of equations represents a reaction mechanism and overall reaction of oxygen to ozone:



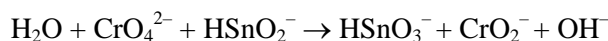
Which substance is the catalyst in the reaction mechanism?

- A)  $\text{O}(\text{g})$       B)  $\text{O}_2(\text{g})$       C)  $\text{NO}(\text{g})$       D)  $\text{NO}_2(\text{g})$       E) sunlight
34. Atoms of element X form a binary compound with scandium having the formula  $\text{Y}_2\text{X}_3$ . The element X could be
- A) sulfur
  - B) carbon
  - C) fluorine
  - D) hydrogen
  - E) phosphorus

35. Which of the following molecules has a zero dipole moment?

- A)  $\text{NH}_3$
- B)  $\text{NO}_2$
- C)  $\text{H}_2\text{O}$
- D)  $\text{BeF}_2$
- E)  $\text{HOCl}$

36. The following equation represents a reaction carried out in a basic solution.



When the equation is balanced, the coefficient of  $\text{HSnO}_2^-$  will be

- A) 1      B) 2      C) 3      D) 5      E) 8
37. Under certain conditions, iodine is a stronger oxidizing agent than sulfur. What is the best *theoretical* explanation for this?
- A) Iodine liberates sulfur from hydrogen sulfide.
  - B) Iodine has a larger atomic number than sulfur.
  - C) Iodine has a greater atomic weight than sulfur.

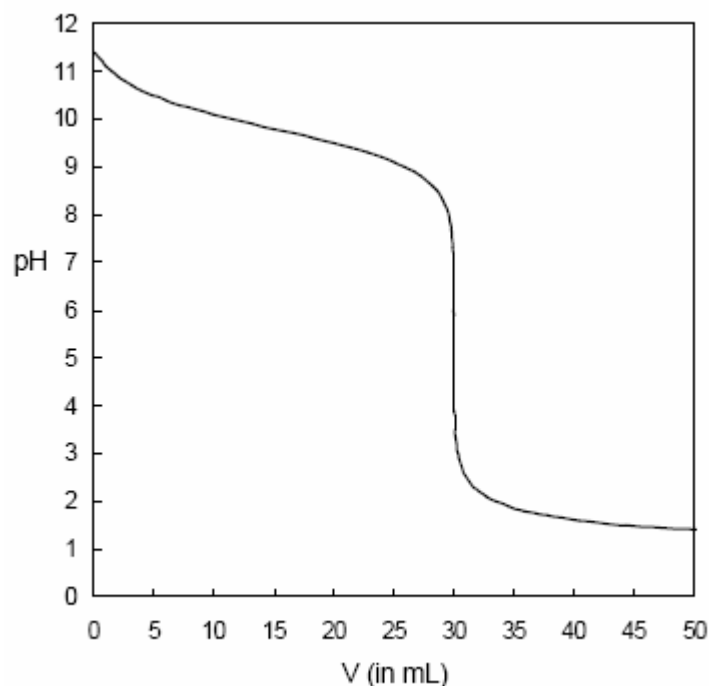


- D) Iodides are, in general, more soluble than sulfides.
- E) Iodine has a greater attraction for electrons than sulfur.

38. If a piece of copper metal is placed in a 1 M  $\text{Zn}(\text{NO}_3)_2$  solution,

Standard Reduction Potentials	$E^0$
$\text{Zn}^{2+} + 2e^- \rightleftharpoons \text{Zn}$	-0.76 V
$\text{Cu}^{2+} + 2e^- \rightleftharpoons \text{Cu}$	0.34 V

- A) copper dissolves completely.
  - B) reaction occurs, but when equilibrium is reached  $[\text{Zn}^{2+}] \gg [\text{Cu}^{2+}]$
  - C) reaction occurs, and when equilibrium is reached  $[\text{Zn}^{2+}] \ll [\text{Cu}^{2+}]$
  - D) reaction occurs until equilibrium is reached, at which time  $[\text{Zn}^{2+}] = [\text{Cu}^{2+}]$
  - E) copper dissolves initially then plates out on the walls of the container.
39. In the reaction
- $$\text{XeF}_2 + \text{BrO}_3^- + \text{H}_2\text{O} \rightarrow \text{Xe} + 2 \text{HF} + \text{BrO}_4^-$$
- A) xenon is oxidized, oxygen is reduced.
  - B) xenon is reduced, bromine is oxidized.
  - C) xenon is reduced, fluorine is oxidized.
  - D) bromine is reduced, xenon is oxidized.
  - E) fluorine is reduced, bromine is oxidized.
40. A student observes that dissolving potassium nitrate in room-temperature water causes the solution to become cool. The student may safely conclude that
- A) The solubility of potassium nitrate will be greater in warm water than in room temperature water
  - B) No chemical change has occurred, as all chemical changes liberate energy
  - C) The solubility of potassium nitrate will be less in warm water than room temperature water
  - D) Potassium and nitrate ions have reacted to produce potassium nitrate molecules, and this process requires energy
  - E) A solubility - temperature prediction should not be made, because dissolving is merely a physical process
41. A saturated solution of  $\text{Ca}(\text{OH})_2$  has a pH of 12.40 at 25°C. What is  $K_{\text{sp}}$  for  $\text{Ca}(\text{OH})_{2(s)}$ ?  
 $K_w = 1.0 \times 10^{-14}$  at 25°C
- A)  $3.2 \times 10^{-4}$
  - B)  $1.6 \times 10^{-5}$
  - C)  $6.3 \times 10^{-5}$
  - D)  $7.9 \times 10^{-6}$
  - E)  $6.3 \times 10^{-38}$
42. The titration curve shown below illustrates which type of titration?



- A) strong base by strong acid  
 B) weak base by strong acid  
 C) weak acid by strong base  
 D) weak acid by strong acid  
 E) weak base by weak acid
43. Separate solutions of the following salts are prepared, each solution having a concentration of 0.10 mol/L. Which solution has the highest pH?
- A)  $\text{Zn}(\text{NO}_3)_2$   
 B)  $\text{NaHSO}_4$   
 C)  $\text{NH}_4\text{Cl}$   
 D)  $\text{NaBr}$   
 E)  $\text{KF}$
44. A mixture of 2.0 mol of  $\text{CO}(g)$  and 2.0 mol of  $\text{H}_2\text{O}(g)$  was allowed to come to equilibrium in a 1 L flask at a high temperature. If  $K_c = 4.0$ , what is the molar concentration of  $\text{H}_2(g)$  in the equilibrium mixture?
- $$\text{CO}(g) + \text{H}_2\text{O}(g) \rightleftharpoons \text{CO}_2(g) + \text{H}_2(g)$$
- A) 0.67      B) 0.75      C) 1.0      D) 1.3      E) 2.0
45. The isotope  $^{209}\text{Pb}$  decays by  $\beta^-$ - emission, losing 90.0% of its radioactivity in 10.80 h. What is its half-life?
- A) 0.308 h      B) 1.80 h      C) 3.25 h      D) 4.69 h      E) 6.77 h
46. The decomposition of dinitrogen pentoxide is represented by the equation:



Initial rate data for the reaction are as follows:

Experiment	$[\text{N}_2\text{O}_5]$	$[\text{O}_2]$	Rate in $\text{M}\cdot\text{s}^{-1}$
1	0.15 M	0.30 M	46
2	0.20 M	0.60 M	61
3	0.20 M	0.30 M	61

What is the rate law for this reaction?

- A) rate =  $k[\text{N}_2\text{O}_5]$
- B) rate =  $k[[\text{N}_2\text{O}_5]^2]$
- C) rate =  $k[\text{N}_2\text{O}_5]^{1.3}[\text{O}_2]^2$
- D) rate =  $k[\text{N}_2\text{O}_5]^2[\text{O}_2]$
- E) rate =  $k[[\text{N}_2\text{O}_5]^2[\text{O}_2]^2]$

47. According to modern bonding theory the number of sigma ( $\sigma$ ) and pi ( $\pi$ ) bonds in the ethylene molecule  $\text{H}_2\text{C}=\text{CH}_2$  is

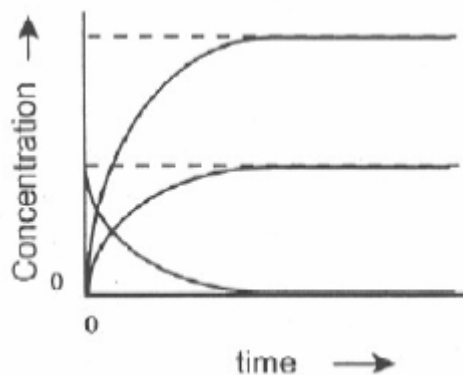
- A) 1  $\sigma$  and 4  $\pi$
- B) 1  $\sigma$  and 5  $\pi$
- C) 1  $\pi$  and 4  $\sigma$
- D) 1  $\pi$  and 5  $\sigma$
- E) 2  $\pi$  and 4  $\sigma$

48. Two electrolytic cells, one containing a silver nitrate solution and the other containing a copper(II) sulfate solution, were connected so that the same current passed through both cells. A current was passed through both solutions until 53.95 g of silver had been deposited.

What mass, in grams, of copper was deposited?

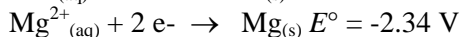
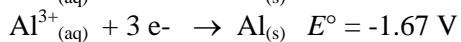
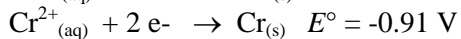
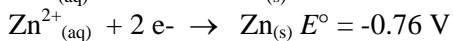
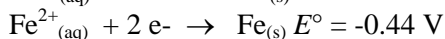
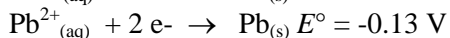
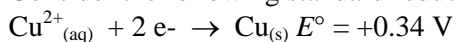
- A) 15.9
- B) 27
- C) 31.8
- D) 54
- E) 63.6

49. Which equation best represents the graph below?

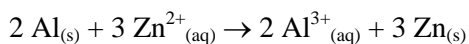


- A)  $A \rightarrow 2B + C$
- B)  $A + 2B \rightarrow C$
- C)  $A + B \rightarrow C$
- D)  $A \rightarrow B + C$
- E)  $2A \rightarrow B + 2C$

50. Consider the following standard reduction potentials:



What is the  $E^\circ$  for the reaction below?



- A) +5.62 V
- B) +2.43 V
- C) +0.91 V
- D) +0.00 V
- E) -0.91 V

Continue on to the next page

**Read the following selection and answer questions 51-55 on the answer sheet.**

**Air Pollution**

Air pollution and air quality were not considered a global concern until the second half of the twentieth century. The topic was traditionally a problem only for heavily industrialized areas. The effects of air pollution and poor air quality manifest far downwind from the sources of the pollution. The cumulative effects of air pollution are historically linked to our dependence on the combustion of fossil fuels to satisfy domestic, industrial and automotive energy demands. Developed nations have implemented costly technologies and pollution regulations to decrease the units of air pollution emitted. However, problems still exist in these nations because of their large populations. Developing nations typically do not have adequate pollution regulations and cannot afford to implement the costly technology to minimize air pollutants. Air pollution and air quality problems extend far beyond urban and industrialized areas.

51. Air pollution contributes to the following environmental problems:
- A) acid rain
  - B) ozone depletion
  - C) global warming
  - D) all of the above
  - E) none of the above
52. Sulfur emissions from coal-fired power plants are one of the sources of air pollution and poor air quality because it
- I. Contributes to the acid rain problem
  - II. Damages the lungs of living organisms
  - III. Smells like rotten eggs
- A) I & II
  - B) I & III
  - C) II & III
  - D) I, II & III
53. The human effect of poor air quality are being seen through an increase in everything but
- A) Asthma and emphysema
  - B) Birth defects and cancer
  - C) Allergies and diabetes
  - D) Bronchitis and pneumonia
54. Which of the following do air pollutants affect the least?
- A) the hydrologic cycle
  - B) the biochemical cycles
  - C) the biosphere
  - D) the atmosphere
  - E) the rock cycle
55. Particulate matter degrades air quality. Which of the following does not contribute to the release of particulates into the air?
- A) Revegetation
  - B) Deforestation
  - C) Urban sprawl
  - D) Volcanic eruptions
  - E) Automobile exhaust

**Read the following selection and answer questions 56-60 on the answer sheet.**

### **Water Pollution**

The majority of the water on this planet is located in the oceans or is frozen. The amount of water on which all plants, animals and people sustain themselves, totals less than one percent. As the human population increases so does their need for water. Presently the majority of the drinking water consumed comes from surface water or groundwater. Restoring polluted surface water and/or groundwater is a time consuming and expensive process. Presently, the primary water pollution problem in the world is the lack of clean, disease-free drinking water. In the United States it is sediment pollution.

56. What tests would you perform on a water sample to help determine if the water sample is disease free?
- A) Nitrogen and phosphorus
  - B) Pesticides and fertilizers
  - C) Heavy metals and sediment
  - D) Fecal coliform and cryptosporidium
  - E) Dissolved oxygen and biological oxygen demand
57. Following a heavy rainfall, a sample of water is taken from a shallow lake. Successive pH readings over several months show the average pH of all the rainfall measurements is 5.0 You should
- A) not worry, it is normal
  - B) test the water for sulfates
  - C) test the water for phosphates
  - D) look at the aquatic insects along the shore
58. If a water body has a mat of green algae growing over its surface it is termed eutrophic. Eutrophication can be caused naturally or by man. If the algae mat gets too thick the water body will
- A) Have an high dissolved oxygen and low biological oxygen demand
  - B) Have a low dissolved oxygen and a high biological oxygen demand
  - C) Have a low dissolved oxygen and a low biological oxygen demand
  - D) Have a high dissolved oxygen and a high biological oxygen demand
59. An increase in sediment in surface water can be caused by
- A) Cultivating crop land
  - B) Construction of buildings
  - C) Grazing or Feeding lots
  - D) All of the above
  - E) None of the above
60. **Eliminated** ~~Aquifers are underground zones from which groundwater can be extracted. Groundwater flows very slowly and if polluted is extremely difficult to remediate. Aquifers are not presently~~
- ~~A) being contaminated by underground storage tanks~~
  - ~~B) being stressed because of an increase in usage~~
  - ~~C) drying up because of lack of recharge~~
  - ~~D) an issue of environmental concern~~
  - ~~E) experiencing salt water intrusion~~

**The End**