

1st Semester Exam  
Chemistry Multiple Choice Section  
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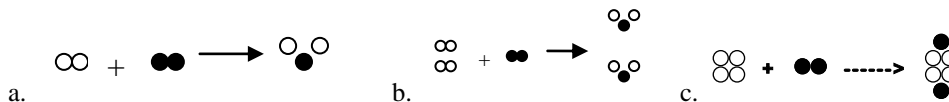
1. What type of science would you consider a research project which uses previous knowledge of virus structure to find a cure for AIDS?  
a. pure science   b. applied science   c. logical science   d. practical science   e. technological science
2. If you want to conduct an experiment which will measure the effect of temperature on the evaporation rate for water, which of the following is the BEST procedure for this experiment?  
a. measure 20, 40, and 60 mL of water into 3 beakers, heat for 10 minutes at 60°C, measure the new volume after 10 minutes  
b. measure 40 mL of water into 3 beakers, heat one for 5 minutes, one for 15 min, and the other for 25 min; measure the amount of water remaining in each beaker  
c. measure 25 mL of water into 3 beakers, place the 3 beakers on 25°C, 50°C, and 75°C heating pads, heat all three beakers for 30 minutes, measure the amount of water remaining in each beaker
3. Express 541,000 in scientific notation  
a. 541,000   b.  $5.41 \times 10^0$    c.  $5.41 \times 10^5$    d.  $5.41 \times 10^{-5}$
4. Express  $3.05 \times 10^{-3}$  in decimal notation  
a. 0.000305   b. 3050   c. 0.00305   d. 0.0305   e. 305
5. How gravity affects an object is known as its \_\_\_\_\_.  
a. weight   b. mass   c. volume   d. density   e. energy
6. The two major characteristics of matter are that it  
a. has definite mass and shape   c. combines with other matter in compounds  
b. has mass and occupies space   d. is made up of atoms and molecules
7. A substance which can not be broken down by chemical means is known as a(n):  
a. element   b. compound   c. homogeneous mixture   d. heterogeneous mixture   e. solution
8. The fact that alkalai metals are able to react violently with acids is known as a  
a. physical change   b. physical property   c. chemical change   d. chemical property
9. When ice melts to become water, this is known as a  
a. physical change   b. physical property   c. chemical change   d. chemical property
10. What were the results and conclusion(s) of Lavoisier's Candle Experiment?  
a. as the candle burned, mass was lost, therefore matter can be destroyed  
b. as the candle burned, mass was lost, therefore matter can be changed into energy  
c. as the candle burned, the soot weighed the same as the original candle, therefore matter is conserved  
d. the flame contains matter
11. Which of the following is a good example of a homogeneous mixture?  
a. chocolate chip cookie   b. Kool-Aid   c. iron   d. water
12. Objects with the same charge  
a. attract each other   b. repel each other   c. have no effect on each other   d. not enough info
13. Which of the following is the best choice for measuring volume of a liquid?  
a. porcelain crucible   b. electronic balance   c. beaker   d. graduated cylinder   e. flask
14. What should you do FIRST if you were to spray acid all over yourself?  
a. go to the eyewash station, place your face above the sprayers, and turn it on with your eyes open  
b. stop, drop, and roll  
c. report the incident to your instructor  
d. run quickly under the shower head and pull the handle to turn it on
15. As the temperature of an object increases,  
a. the particles move faster   c. it loses heat  
b. the particles move more slowly   d. it releases cold waves
16. Metals are used to make pots and pans because they are good \_\_\_\_\_ of heat.  
a. generators   b. conductors   c. insulators   d. holders   e. absorbers
17. The best example of kinetic energy in the following list is:  
a. a wound-up spring   c. an object sitting on a table  
b. an electron orbiting around a nucleus   d. an atom at absolute zero
18. Which of the following is absolute zero?  
a. 0 K   b. 0°C   c. 0°F   e. a,b, & c

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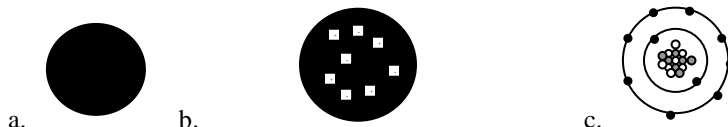
19. Which of the following is the correct empirical formula for the molecular formula  $C_8H_{18}$ ?

- a. CH    b.  $CH_2$     c.  $C_2H_5$     d.  $C_4H_9$     e.  $C_8H_{18}$

20. Which picture below best represents the balanced equation:  $2 H_2 + O_2 \rightarrow 2 H_2O$ ?



21. Which of the following pictures best represents the “plum pudding” model of the atom?



22. We usually express the mass of an object or substance in which units?

- a. meters    b. liters    c. grams    d. pounds    e. moles

23. Which number, known as Avogadro’s Number, is used to represent a mole of objects?

- a. 1 mole    b. 22.4    c.  $6.02 \times 10^{23}$     d. factor

24. Balance the following equation:  $\underline{\hspace{1cm}} Cu + \underline{\hspace{1cm}} AgNO_3 \rightarrow \underline{\hspace{1cm}} Cu(NO_3)_2 + \underline{\hspace{1cm}} Ag$

- a. 1,1,1,1    b. 1,2,1,2    c. 2,1,2,1    d. 4,2,4,2    e. 1,2,2,1

25. Balance the following equation:  $\underline{\hspace{1cm}} C_7H_{16} + \underline{\hspace{1cm}} O_2 \rightarrow \underline{\hspace{1cm}} CO_2 + \underline{\hspace{1cm}} H_2O$

- a. 1,1,1,1    b. 1,7,7,8    c. 1,11,7,8    d. 1,4,7,8    e. 2,14,14,16

26. Which of the reactions shown below is a combustion reaction?

- a.  $2 H_2 + O_2 \rightarrow 2 H_2O$     b.  $2 HgO \rightarrow 2 Hg + O_2$   
c.  $CH_4 + 2 O_2 \rightarrow CO_2 + 2 H_2O$     d.  $Al + NaNO_3 \rightarrow Al(NO_3)_3 + Na$

27. Which of the reactions shown below is a decomposition reaction?

- a.  $2 H_2 + O_2 \rightarrow 2 H_2O$     b.  $2 HgO \rightarrow 2 Hg + O_2$   
c.  $CH_4 + 2 O_2 \rightarrow CO_2 + 2 H_2O$     d.  $Al + NaNO_3 \rightarrow Al(NO_3)_3 + Na$

28. Which of the following reactions would not occur (“NR”)?

- a.  $2 H_2 + O_2 \rightarrow 2 H_2O$     b.  $Na + CuNO_3 \rightarrow NaNO_3 + Cu$   
c.  $Ba(NO_3)_2 + Na_2CO_3 \rightarrow BaCO_3 + 2 NaNO_3$     d.  $Al + 3 NaNO_3 \rightarrow Al(NO_3)_3 + 3 Na$

29. Which of the following elements is a member of the halogen family?

- a. sodium    b. calcium    c. silver    d. chlorine    e. krypton

30. Which of the following is found in the nucleus of an atom?

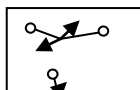
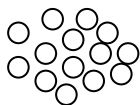
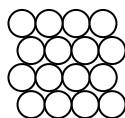
- a. protons    b. neutrons    c. electrons    d. a & b    e. a & c    ab. b & c    ac. a,b, & c

31. Which of the following elements is the most electronegative?

- a. potassium    b. helium    c. francium    d. hydrogen    e. fluorine

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32. When all electrons are in their lowest possible energy levels, this is known as the:  
a. excited state   b. ground state   c. atomic state   d. confused state
33. If an atom has an unbalanced number of protons and electrons, it becomes charged, and is known as a(n):  
a. atom   b. ion   c. isotope   d. nucleus   e. compound
34. What was(were) the conclusion(s) of Rutherford's Gold Foil Experiment?  
a. atoms are mostly empty space                      c. the nucleus is positively charged                      e. a & c  
b. electrons are found in energy levels                      d. a & b                      ab. a,b, & c
35. Which of the following is a nonmetal?  
a. iron   b. oxygen   c. uranium   d. sodium   e. aluminum
36. If an atom (or ion) has 49 protons, 66 neutrons, and 46 electrons, what element is it?  
a. palladium   b. indium   c. dysprosium   d. americium   e. molybdenum
37. If an atom has 12 protons, 13 neutrons, and 10 electrons, what is its mass number?  
a. 12   b. 13   c. 22   d. 25   e. 35
38. What is the charge of the atom in question #37?  
a. -2   b. -1   c. neutral   d. +1   e. +2
39. How many neutrons are there in an atom of Nickel-59?  
a. 28   b. 29   c. 31   d. 58.69   e. 59
40. Which of the following drawings best represents the molecular structure of a solid?



41. What is the formula for tetraphosphorus decoxide?  
a. PO   b.  $P_4O_{10}$    c.  $P_3O_{10}$    d.  $P_5O_{10}$    e.  $PO_4$
42. What is the formula for aluminum sulfate?  
a. AlS   b.  $Al_2S_3$    c.  $AlSO_4$    d.  $Al_2(SO_4)_3$    e.  $Al(SO_4)_3$
43. What is the formula for chromium (III) nitrate?  
a.  $Cr(NO_3)_3$    b.  $Cr(NO_3)_2$    c.  $CrNO_3$    d.  $Cr_3NO_3$    e. CrN
44. What is the name for  $(NH_4)_2SO_4$ ?  
a. ammonium sulfate                      b. ammonium (I) sulfate                      c. ammonium (II) sulfate  
d. ammonium (II) sulfide                      e. ammonium (I) sulfide
45. What is the name for  $Fe_2O_3$ ?  
a. iron oxide                      b. iron (II) oxide                      c. iron (III) oxide  
d. iron (II) oxalate                      e. iron (III) oxalate
46. What is the name for  $Na_2CO_3$ ?  
a. sodium carbon trioxide                      b. sodium carbonate                      c. disodium carbonate  
d. sodium(II) carbonate                      e. sodium(I) carbonate
47. What is the name for  $N_2O_3$ ?  
a. nitrogen(II) oxide                      b. nitrogen(III) oxide                      c. nitrogen oxalate  
d. nitrous oxide                      e. dinitrogen trioxide
48. What is the name for  $HgSO_4$ ?  
a. mercury tetrasulfate                      b. mercury(II) sulfate                      c. mercury(I) sulfate  
d. mercury sulfite                      e. mercury sulfide
49. Which element makes up almost 50% of the earth's total mass?  
a. carbon   b. nitrogen   c. hydrogen   d. iron   e. oxygen
50. What element shown below is diatomic?  
a. carbon ( $C_2$ )   b. iron ( $Fe_2$ )   c. nitrogen ( $N_2$ )   d. helium ( $He_2$ )   e. gold ( $Au_2$ )