Final Exam Test Questions Review

1. Which type of matter can be separated into its parts using physical methods like filtration or settling?
   a. Elements
   b. Compounds
   c. Heterogenous mixture
   d. Homogenous mixture
   e. Solutions

2. Which of the following are chemical processes?
   a. Compression of oxygen gas
   b. Freezing of water
   c. Melting of butter
   d. Rusting of a nail

3. In which one of the following are all the zeroes significant?
   a. 0.15632
   b. 0.1000
   c. 00.0030020
   d. 0.083624
   e. 100.090090

4. There are _____ electrons _____ protons, and _____ neutrons in an atom of $^{132}_{54}Xe$
   a. 132,132,54
   b. 54,54,132
   c. 78,78,54
   d. 54, 54, 78
   e. 78, 78, 132

5. Element Z has two naturally occurring isotopes:
   Z-63 with a mass of 62.93 amu and a natural abundance of 69.17%
   Z-65 with a mass of 64.93 amu and a natural abundance of 30.83%
   Calculate the average atomic mass of element

6. Which formula/name pair is incorrect?
   a. $Mn(NO_2)_2$ manganese (II) nitrite
   b. $Mg(NO_3)_2$ magnesium nitrate
   c. $Mn(NO_3)_2$ magnesium nitrite
   d. Mg_3N_2 magnesium permanganate

7. The combustion of propane (C3H8) in the presence of excess oxygen fields CO2 and H2O:
   C_3H_8 (g) + O_2 --> CO_2 (g) + H_2O (g)
   When 2.5 mol of O2 are consumed in their reaction, _____ mol of CO2 are produced?

8. An aqueous ethanol solution (400 ml) was diluted to 4.00 L, giving a concentration of 0.0400 M. The concentration of the original solution was _____ M.
   a. 0.400 M
   b. 0.200 M
   c. 2.00 M
   d. 4.00 M

9. A chemical reaction that absorbs heat from the surroundings is said to be _____ and has a _____ ΔH at constant temperature.
   a. Exothermic, neutral
   b. Exothermic, positive
   c. Endothermic, negative
   d. Endothermic, positive

10. True or false: The ground state electron of Cu is [Ar] $4s^1 3d^{10}$

11. The value of ΔH for the reaction below is –790 KJ. The enthalpy change accompanying the reaction of 0.95 g of S is _____ KJ.

    $2\ S\ (s) + 3\ O_2\ (g) \rightarrow 2\ SO_3\ (g)$

    a. 23 KJ
    b. -23 KJ
    c. 12 KJ
    d. -12 KJ

12. The wavelegth of light has a frequency of 1.66×10^9 s-1 is _____ m.
    a. 6.63 m
    b. 0.182 m
    c. 2.00×10^{-9} m
    d. 5.53×10^8 m

13. In general, as you go across a period in the periodic table from left to right:
    I. The atomic radius _____
    II. The electron affinity becomes _____ negative
    III. The first ionization energy _____

14. Which of the following would have to lose two electrons in order to achieve a noble gas electron configuration? **O Sr Na Se Br**

15. Arrange the following gases in order of increasing average molecular speed at 25°C
    He, O_2, CO_2, N_2

16. A sample of a gas originally at 29°C and 1.25 atm pressure in a 3.0 L container is allowed to contract until the volume is 2.2 L and the temperature is 11°C. The final pressure of the gas is _____ atm.

17. The strongest interparticle attractions (IMFs) exist between particles of a _____, and the weakest interparticle attractions exist between particles of a _____.

18. True or false: All molecules experience London Dispersion forces.

19. Of the following substances, _____ has the highest boiling point.
    a. O_2
    b. Cl_2
    c. N_2
    d. Br_2

20. What is the formal charge of nitrogen in NO_3^-? Draw the Lewis structure

21. True or false: A volatile liquid is one that is highly viscous.

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