Name:_____

1) What is the concentration (molarity) of a solution that has 1.23 g of dissolved Na_2HPO_4 in 883.6 mL of solution.

   $c(Na_2HPO_4)$ = _____

2) What is the concentration (molarity) of a solution that has 5.41 g of dissolved $Fe(NO_3)_3$ in 398.9 mL of solution.

   $c(Fe(NO_3)_3)$ = _____

3) 752.1 mL of a 2.83 M solution of NaCl is diluted to 21.011 L. What is the concentration of the resultant solution?

   c(NaCl) = _____

4) 62.36 mL of a 1.07 M solution of $Zn(NO_3)_2$ is diluted to 1036.0 mL. What is the concentration of the resultant solution?

   $c(Zn(NO_3)_2)$ = _____

5) For the following reaction: $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$, 17.9940 g of O_2 is reacted with an excess of C_3H_8 . How many grams of CO_2 should be produced?

   $m(CO_2)$ = _____

6) For the following reaction: $3H_2 + N_2 \rightarrow 2NH_3$, 9.4678 g of N_2 is reacted with an excess of H_2 . How many grams of NH_3 should be produced?
   $m(NH_3)$ = _____

7) For the following reaction: $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$, if 12.6003 g of O_2 reacts with 80.1480 g of C_3H_8 , how many grams of H_2O should be produced?
   $m(H_2O)$ = _____

8) For the following reaction: $2CH_3OH + 3O_2 \rightarrow 2CO_2 + 4H_2O$, if 4.7710 g of O_2 reacts with 67.2581 g of CH_3OH , how many grams of CO_2 should be produced?
   $m(CO_2)$ = _____

Name:_____

9) For the following reaction: $2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$, 30.0700 g of C_2H_6 is reacted with an excess of O_2 . 11.6890 grams of H_2O is recovered. What is the percent yield?

$\%_{yield}(H_2O)$ = _____

10) For the following reaction: $2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$, 30.0700 g of C_2H_6 is reacted with an excess of O_2 . The percent yield is 85.5% What mass of H_2O is recovered?

m (H_2O) = _____

12) 21.96 mL of $Ca(OH)_2$ is titrated with 0.7695 M HCl . 44.85 mL of HCl was required to reach an endpoint. What is the concentration of the $Ca(OH)_2$?
The reaction is: $2HCl + Ca(OH)_2 \rightarrow CaCl_2 + 2H_2O$.

$c(Ca(OH)_2)$ = _____

13) How much 1.4181 M HNO_3 is needed to neutralize 9.63 mL of 0.5353 M $Ca(OH)_2$?
The reaction is: $Ca(OH)_2 + 2HNO_3 \rightarrow 2H_2O + Ca(NO_3)_2$.

V = _____

14) The pressure of He in a container at 23.61 °C is 1.62 atm. The volume of the container is 6.85 L. What mass of He is contained?

m = _____

15) At what temperature is 475.15 g of Kr gas with a pressure of 4.69 atm contained in a 44.37 L volume.

T = _____

16) Kr is contained in a rigid, leak–tight stainless steel cylinder at –11 °C and a pressure of 5.52 atm. If the temperature were to change to 398 °C, what would the pressure be?

T = _____

Name:_____

17) Ar is contained in a flexible container and held at a constant temperature. Initially, the volume of the container was 9.13 L and the pressure was 1.21 torr. The pressure was changed to 2.18 torr without any lose or gain of material or temperature change. What was the final volume?

V = _____

18) One mole of an ideal gas is contained in a volume at 183.3 °C and 3.89 atm. If the pressure is lowered to 1.00 atm and the temperature to 0.00 °C, what volume would this gas occupy?

V = _____

19) A container holds 544.5 torr of Ne and water liquid and vapor at 29.0 °C. What is the total pressure? Give the answer to the nearedst 0.01 torr.

P = _____

20) How much faster would one expect CH_4 to diffuse versus C_2H_6? (Give a number.)

Ratio = _____

KEY

1) $c(Na_2HPO_4) = 9.81 \times 10^{-3}$ M

2) $c(Fe(NO_3)_3) = 5.61 \times 10^{-2}$ M

3) $c(NaCl) = 1.01 \times 10^{-1}$ M

4) $c(Zn(NO_3)_2) = 6.44 \times 10^{-2}$ M

5) $m(CO_2) = 15.5$ g

6) $m(NH_3) = 11.50$ g

7) $m(H_2O) = 5.67$ g (wrong answer = 27.67 g)

8) $m(CO_2) = 4.37$ g (wrong answer = 9.25 g)

9) $[\%_{yield}] = 21.4\%$

10) 80.5% $m(H_2O) = 43.57$ g

12) 0.7859 M $Ca(OH)_2$

13) 7.27 mL HNO_3

14) 1.824 g

15) 447.24 K 174.09°C

16) 14.13 atm

17) 5.07 L

18) 22.4 L

19) 544.7 torr

20) 1.37