

NAME _____

Indicate your answers on the answer sheet provided.

$$N_A = 6.022 \times 10^{23}$$

$$T_{/K} = t_{/C} + 273.15$$

- 1) Which of the following is a characteristic of a scientific theory?
- A A theory is proven beyond a doubt.
 - B A theory is never really useful for practical applications
 - C A theory is always tentative.
 - D Beyond the original proof, theories cannot be proven.
 - E A theory must eventually be proven to be valid.
- 2) Convert 18.7 kg to grams. Give your answer to 3 significant figures.
- 3) Calculate the density of a piece of metal that has a mass of 24.2 g and a volume of 3.08 mL.
- 4) Calculate the number of moles there are in 28.1 g of CH₄.
- 5) How many molecules are there in 25.2 moles of a compound?
- 6) How many grams of CaCl₂ are produced by reacting 2.31 g of HCl with an excess of Ca(OH)₂?
The reaction is: $2\text{HCl} + \text{Ca}(\text{OH})_2 \rightarrow \text{CaCl}_2 + 2\text{H}_2\text{O}$.
- 7) What is molarity of a solution made by dissolving 149 g of NaCl in 505 mL of a water solution.
- 8) How many grams of CaSO₄ are produced by reacting 2.16 g of Ca(OH)₂ with 2.60 g of H₂SO₄?
The reaction is: $\text{H}_2\text{SO}_4 + \text{Ca}(\text{OH})_2 \rightarrow \text{CaSO}_4 + 2\text{H}_2\text{O}$.
- 9) Give the answer to the following operation to the correct number of significant figures.
- | |
|----------------------|
| <u>5.121 + 7.356</u> |
| 1.31412 |
- 10) How many protons and neutrons are there in the isotope ⁶⁰Co ?
- A 33 protons and 27 neutrons
 - B 27 protons and 60 neutrons
 - C 27 protons and 33 neutrons
 - D 60 protons and 27 neutrons
 - E 33 protons and 60 neutrons

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11) Which of the following is an Arrhenius acid-base reaction?

- A $\text{Pb}(\text{NO}_3)_2 (\text{aq}) + 2\text{NaI} (\text{aq}) \rightarrow \text{PbI}_2 (\text{s}) + 2\text{NaNO}_3 (\text{aq})$
B $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
C $\text{Ag}^+ + \text{Cl}^- \rightleftharpoons \text{AgCl}$
D $3\text{H}_2 + \text{N}_2 \rightarrow 2\text{NH}_3$
E $\text{NH}_3 + \text{H}_2\text{O} \rightleftharpoons \text{NH}_4^+ + \text{OH}^-$

12) Which of the following is an Brønsted-Lowry acid-base reaction?

- A $\text{Pb}(\text{NO}_3)_2 (\text{aq}) + 2\text{NaI} (\text{aq}) \rightarrow \text{PbI}_2 (\text{s}) + 2\text{NaNO}_3 (\text{aq})$
B $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
C $\text{Ag}^+ + \text{Cl}^- \rightleftharpoons \text{AgCl}$
D $3\text{H}_2 + \text{N}_2 \rightarrow 2\text{NH}_3$
E $\text{NH}_3 + \text{H}_2\text{O} \rightleftharpoons \text{NH}_4^+ + \text{OH}^-$

13) In the following reaction what would be the percent yield of AgCl if 3.93 g of SrCl_2 reacts with an excess of AgNO_3 to yield 8.70 g of AgCl. $2\text{AgNO}_3 (\text{aq}) + \text{SrCl}_2 (\text{aq}) \rightarrow 2\text{AgCl} (\text{s}) + \text{Sr}(\text{NO}_3)_2 (\text{aq})$

14) Which of the following compounds is a totally ionic compound?

- A CH_4 B NaNO_3 C LiH D HCl E CH_3COOH

15) Which of the following compounds is a totally covalent compound?

- A CaF_2 B CH_3COOH C LiClO_4 D RbCl E NaH

16) A compound is 65.1% K, 17.2% P and 17.7% O. What is the empirical formula for this compound?

17) 345.40 °C is how much in kelvins?

18) What is the percent iron in a sample that is 17 g of iron and 100 g of sand?

19) The following number has how many significant digits? 0.002

20) Which of the following phases retains its volume but conforms to the volume of the container

- A A solid B A liquid C A gas D A solution E A mixture

NAME _____

1) **A** **B** **C** **D** **E**

2) _____

3) _____

4) _____

5) _____

6) _____

7) _____

8) _____

9) _____

10) **A** **B** **C** **D** **E**

11) **A** **B** **C** **D** **E**

12) **A** **B** **C** **D** **E**

13) _____

14) **A** **B** **C** **D** **E**

15) **A** **B** **C** **D** **E**

16) **Na** ____ **S** ____ **O** ____

17) _____

18) _____

19) _____

20) **A** **B** **C** **D** **E**

- 1) **C**
- 2) **1.87E+04**
- 3) **7.85**
- 4) **1.76**
- 5) **1.52E+25**
- 6) **3.51**
- 7) **5.05** (3sig fig)
- 8) **3.61**
- 9) **9.4946** (sig fig)
- 10) **C**
- 11) **B**
- 12) **E**
- 13) **89.5**
- 14) **C**
- 15) **B**
- 16) **Na 3 S 1 O 2**
- 17) **618.55**
- 18) **15%**
- 19) **1**
- 20) **B**