

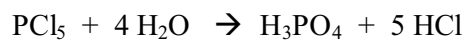
## PRACTICE CHEMISTRY PLACEMENT EXAM

1. How many of the numbers below have 5 significant figures?

0.0054      19.000      0.00006       $1.6090 \times 10^8$       13607

- a) 1
  - b) 2
  - c) 3
  - d) 4
  - e) 5
2. Nitric acid is a solution of which of the following dissolved in water?
- a)  $\text{HNO}_4$
  - b)  $\text{H}_2\text{NO}_3$
  - c)  $\text{HNO}_2$
  - d)  $\text{HNO}_3$
  - e)  $\text{H}_2\text{NO}$
3. Which of the following is the smallest mass?
- a) 2.1 kg
  - b)  $4.2 \times 10^{10}$  ng
  - c)  $5.8 \times 10^2$  g
  - d)  $8.4 \times 10^4$  cg
  - e)  $6.7 \times 10^4$  mg
4. If 250 mL of a 0.50 M NaCl solution is diluted to 840 mL, what is the molarity of the resulting solution?
- a) 0.15 M
  - b) 6.7 M
  - c) 0.60 M
  - d) 1.7 M
  - e) 0.0025 M
5. Iron(III) sulfite has the formula
- a)  $\text{Fe}_3\text{SO}_3$
  - b)  $\text{Fe}_2(\text{SO}_4)_3$
  - c)  $\text{Fe}_2(\text{SO}_3)_3$
  - d)  $\text{Fe}_2\text{SO}_4$
  - e)  $\text{Fe}_2\text{SO}_3$

6. How many atoms of carbon are in 24 grams of carbon?
- a)  $1.2 \times 10^{24}$  atoms
  - b)  $1.7 \times 10^{26}$  atoms
  - c)  $1.2 \times 10^{25}$  atoms
  - d)  $3.0 \times 10^{24}$  atoms
  - e)  $3.0 \times 10^{23}$  atoms
7. A solution is prepared by dissolving sugar in water. The solution is 25.0%, by mass, sugar. How many grams of **WATER** are in 472 grams of this solution?
- a) 118 g
  - b) 157 g
  - c) 408 g
  - d) 354 g
  - e) 396 g
8. The balanced chemical equation for the reaction between  $\text{PCl}_5$  and water is given below. If 3.45 moles of HCl are produced, how many moles of water reacted?



- a) 0.690 mol
  - b) 0.863 mol
  - c) 2.76 mol
  - d) 3.45 mol
  - e) 4.31 mol
9. How many grams of calcium bromide are in 50.0 mL of a 0.25 M calcium bromide solution?
- a) 2.5 g
  - b) 1.5 g
  - c)  $1.3 \times 10^{-2}$  g
  - d) 24 g
  - e) 40. g
10. 26.0 g of a liquid that has a density of 1.44 g/mL needs to be measured out in a graduated cylinder. What volume should be used?
- a) 37.4 mL
  - b) 0.0554 mL
  - c) 18.1 mL
  - d) 0.0267 mL
  - e) 26.0 mL

11. One gram of alum,  $\text{KAl}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$ , contains  $1.3 \times 10^{21}$  Al atoms. How many oxygen atoms are contained in 1.0 g alum?
- a)  $1.3 \times 10^{21}$  atoms
  - b)  $2.6 \times 10^{22}$  atoms
  - c)  $1.6 \times 10^{22}$  atoms
  - d)  $1.0 \times 10^{22}$  atoms
  - e)  $2.1 \times 10^{22}$  atoms

12. How many grams of  $\text{AlF}_3$  are in 2.64 moles of  $\text{AlF}_3$ ?

- a)  $3.14 \times 10^{-2}$  g
- b) 121 g
- c) 222 g
- d)  $5.74 \times 10^{-2}$  g
- e) 31.8 g

13. The balanced chemical equation for the reaction between  $\text{PCl}_5$  and water is given below. If 12.0 g of  $\text{PCl}_5$  reacts completely with water, how many grams of HCl will be produced?



- a) 60.0 g
- b) 2.10 g
- c) 0.420 g
- d) 0.0952 g
- e) 10.5 g

14. Which of the following would be the correct name for  $\text{N}_2\text{O}_3$ ?

- a) dinitrogen trioxide
- b) nitrogen(II) oxide
- c) nitrogen(III) oxide
- d) nitrogen oxide
- e) nitrogen(II) oxygen(III)

15. How many moles of  $\text{C}_4\text{F}_8$  are in 265 grams of  $\text{C}_4\text{F}_8$ ?

- a) 8.55 mol
- b)  $1.89 \times 10^{-5}$  mol
- c)  $5.30 \times 10^4$  mol
- d) 1.32 mol
- e) 0.755 mol

16. What is the percent, by mass, of oxygen in  $\text{Zn}(\text{BrO}_3)_2$ ?

- a) 24.83%
- b) 39.00%
- c) 29.89%
- d) 39.79%
- e) 17.57%

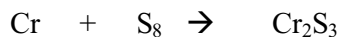
17. Given:  $Z = 0.43Y + 12$  ; What is Y when  $Z = 28$  ?

- a) 93
- b) 6.9
- c) 24
- d) 17
- e) 37

18. A metal having a mass of 44 grams is dropped in  $118.2 \text{ cm}^3$  of water and sinks to the bottom. The volume of the water and object is  $124.3 \text{ cm}^3$ . What is the density of the metal?

- a)  $0.37 \text{ g/cm}^3$
- b)  $7.2 \text{ g/cm}^3$
- c)  $0.35 \text{ g/cm}^3$
- d)  $2.7 \text{ g/cm}^3$
- e)  $2.9 \text{ g/cm}^3$

19. When the equation below is properly balanced, what is the coefficient for  $\text{S}_8$ ?



- a) 1
- b) 2
- c) 3
- d) 4
- e) none of these

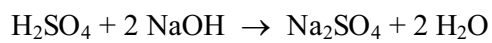
20. An antacid tablet containing 0.50 g of  $\text{NaHCO}_3$  is dissolved in 250 mL of water. What is the molar concentration of  $\text{NaHCO}_3$  in the solution?

- a) 0.024 M
- b) 4.1 M
- c) 0.0020 M
- d) 0.0060 M
- e) 2.0 M

21. What is the formula of the compound formed between the potassium ion and the sulfide ion?

- a) KS
- b)  $\text{KS}_2$
- c)  $\text{K}_2\text{S}_3$
- d)  $\text{KS}_3$
- e)  $\text{K}_2\text{S}$

22. How many mL of 0.250 M  $\text{H}_2\text{SO}_4$  is required to completely react with 25.0 mL of 1.50 M NaOH?



- a) 150. mL
- b) 50.0 mL
- c) 300. mL
- d) 75.0 mL
- e) none of the above

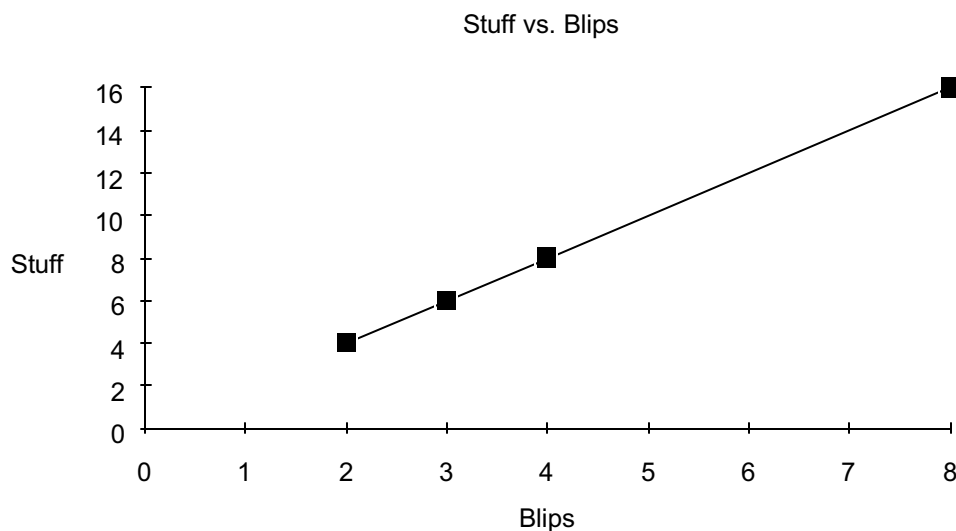
23. Assume that you are a physician administering a drug in a solution containing 5.0 mg drug/L solution. If the recommended dosage of the drug is  $3.5 \times 10^{-6}$  g per kilogram of body weight, what volume of solution would you prescribe daily for a 68 kg patient?

- a) 97 mL
- b) 53 mL
- c) 86 mL
- d) 23 mL
- e) 48 mL

24. How many kilometers is  $5.82 \times 10^4$  cm?

- a)  $5.82 \times 10^3$  km
- b) 0.582 km
- c)  $5.82 \times 10^9$  km
- d) 5.82 km
- e)  $5.82 \times 10^5$  km

25. Data was collected on an experiment that relates "Stuff" to "Blips". Using a "best fit" line for the data, how much stuff would I have if I had 20 blips?



- a) 0
- b) 10
- c) 20
- d) 30
- e) 40

Answers:

1. c
2. d
3. b
4. a
5. c
6. a
7. d
8. c
9. a
10. c
11. b
12. c
13. e
14. a
15. d
16. c
17. e
18. b
19. c
20. a
21. e
22. d
23. e
24. b
25. e