Laboratory Math Worksheet

1. 1 kg = _____lb

2. 1 lb = _____g

3. 5 M H_2SO_4 is equivalent to _____N H_2SO_4

4. 5 M HCl is equivalent to _____N HCL

5. For H_2SO_4, the M.W. is _____g, Eq. Wt. is _____g and mEq Wt. is _____mg

6. For HCl, the M.W. is _____g, Eq. Wt. is _____g and mEq Wt. is _____mg

7. For H_3PO_4, the M.W. is _____g, Eq. Wt. in _____g and mEq Wt. is _____mg

8. 1 Equivalent of Na^+ is ____g

9. 1 mEq of Na^+ is _____mg

10. 1 Equivalent of Ca^{++} is _____g

11. 2 mEq of Ca^{++} is _____g

12. 46 g of Na^+ contains _____equivalents

13. 46 g of Na+ contains _____mEq

14. 80 g NaOH contains _____g of Na^+

15. 80 g NaOH contains _____equivalents of Na^+

16. 80 g NaOH contains _____milliequivalents of Na^+

17. 80 g NaOH/100 mL = _____g NaOH/L

18. 80 g NaOH/L can be expressed as _____g Na^+/L

19. 80 g NaOH/L can be expressed as _____g Na^+/dL

20. 80 g NaOH/L can be expressed as _____mEq Na^+/L

21. 20 mL of a solution containing 80 g NaOH/L would contain _____mg Na^+ or _____mEq of Na^+ or _____eq of Na^+

22. Specific Gravity (SG) or density of 1.84 means that 1mL of the solution weighs _____g.

23. 268 g of Na_2SO_4 7H2O contains _____g of Na+.

24. 536 g of Na_2SO_4 7H2O contains _____Eq of Na+

25. You are asked to prepare 3500 mL of isotonic NaCl (0.85% w/v). How many grams of solid NaCl do you need to weigh out?

26. How many grams of H_2SO_4 do you need to prepare an 18 L container of 0.12 N H_2SO_4?

27. A 1:5 dilution is diluted 2:50 and then 1:5. What is the final dilution?

28. In a chemical analysis of blood, a 4mL aliquot of a 1:20 dilution is used. How much blood does the 4 mL aliquot contain?

29. Having weighed out exactly the theoretical amount of KOH needed to make 2 L of a 0.1 N solution, and having made the solution, you suddenly realize that the solid used was NaOH and not KOH. How much water should you add to make the resulting solution 0.1 N NaOH?

30. You need to prepare a 10% $CaCl_2$ (w/v) solution and only $CaCl_2$ $10H_2O$ is available on your stock shelf. How many grams would you weigh out to prepare 250mL of this reagent?

31. What is the normality of a solution of NaOH containing 40 g NaOH/dL of solution?

32. How many milliequivalents of HCl are there in 165.00 mL of 0.1173 N solution?

33. A 1 L solution is known to be exactly 0.1175 N. How much water would you add to a liter of it to get exactly 0.0950 N solution?

34. A glucose standard contains 2 mg/mL of glucose. A 1:10 dilution of this standard would contain how much glucose/dL?

35. With a 19mm cuvet, a certain solution reads 0.200. The solution in a 12 mm cuvet would read approximately?

36. A patient's weight is 171 lbs. How many kg do they weigh?**this is not a conversion you will need to memorize, this is to give you an idea of relationship between average weights in lbs and kg.

37. SITUATION: A mixed sodium and potassium standard was prepared by weighing 0.2238 g KCl and 4.6763 g NaCl, quantitatively transferring to a 500 mL volumetric flask and dilution to the mark with distilled water. The respective concentrations of the standard expressed as mEq Na^+ and mEq K^+/L are: (atomic weights L=39; Cl=35.5; Na=23)
    a. 140 mEq Na^+ and 5.0 mEq K^+ per liter
    b. 145 mEq Na^+ and 5.5 mEq K^+ per liter
    c. 150 mEq Na^+ and 6.0 mEq K^+ per liter
    d. 160 mEq Na^+ and 6.0 mEq K^+ per liter

38. How many grams of NaCl are in 100 mL of 0.85% (w/v) NaCl? How many mg of Na?

39. You are tasked to prepare 250 mL of a solution that contains 2% glucose and 5% KCl. How many grams of glucose should be weighed out? How many grams of KCl?

40. SITUATION: The magnesium concentration of a serum sample was reported as 3.6 mg/deciliter serum. The magnesium concentration expressed as mEq magnesium/L would be:

41. Calculate the molarity and normality of 8.00 g NaOH in 0.125 L of solution.

42. Calculate the molarity and normality of 0.630 g $H_2C_2O_4$ 2H2O in 400 mL solution.

43. Calculate the molarity and normality of 24.5 mg H_2SO_4 in 20.0 mL solution.

44. 125.0 mL of a solution is diluted to 200.0 mL and the normality of the latter solution is found to be 0.2500. What is the normality of the original solution?

45. What volume of water should be added to 600 mL of a 0.150 N solution to make the normality 0.100?

46. What volume of isotonic saline (0.85% w/v NaCl) can be prepared from 42.5 g of NaCl?

47. What weight of H_2SO_4 is required to prepare 400 mL of a 3 M solution?

48. What weight of NaOH is required to prepare 3000 mL of a 0.5 M solution?

49. How many micrograms of NaCl would 300 mL of a $1x10^{-6}$ M solution contain?

50. A solution contains 3.65 g of HCl in a liter. How many millimoles of HCl does it contain?

51. A liter of 5% glucose solution contains what weight of glucose?

52. A 24 hour urine specimen (1250 mL) weighed 1265 g. What is the SG of the urine specimen?

53. If a normal room temp is about 70^{o}F, what would we expect the temperature to be in °C? ?**this is not a conversion you will need to memorize, this is to give you an idea of relationship between room temps in °F and °C.