

Name: \_\_\_\_\_

Part 1: **No calculator is allowed.** *Smart phones, iPods, iPads, or similar tablets or any device that is able to send/receive data may not be used on exams. Furthermore, headphones may not be worn during exams. No books or notes.* Give exact answers unless otherwise stated.

1.) Express the number in scientific notation: 0.000000009850	2.) Express the number in decimal notation: $9.15 \times 10^7$
3.) Evaluate: $-(-9)^0$	4. Write the equivalent logarithmic equation: $Q^2 = p$ .
5.) Find the number of significant figures. 102.0030	6.) Compute: $\log_2 128$
7.) Based on how we round numbers, write down the range of numbers that 12.53 represents.  _____ $\leq 12.53 <$ _____	8.) Simplify. Write with positive exponents: $\left(\frac{15x^{-8}y^0}{20x^8y^{-2}}\right)^{-3}$
9.) Write as a single logarithm.  $2\log_3 x - 5\log_3 y + 3\log_3 z$	10.) Solve: $\log_3 x = -3$
11.) Perform the indicated operation:  $3.4 \times 10^{-5} - 7.25 \times 10^{-6}$	12.) Perform the indicated operation:  $4.54 \times 10^4 + 2.2 \times 10^3$

Part 2: You may use a scientific or graphing calculator. No books or notes. *Smart phones, iPods, iPads, or similar tablets or any device that is able to send/receive data may not be used on exams. Furthermore, headphones may not be worn during exams. No books or notes.* Write your answer in scientific notation where appropriate.

13.) Calculate according to the correct number of significant figures. $92.1 \times 5.722$	14.) Calculate according to the correct number of significant figures. $\frac{8.4 \times 10^{13}}{1.89 \times 10^{-8}}$
15.) Given $\text{pH} = -\log[\text{H}_3\text{O}^+]$ . Find the pH value when: $[\text{H}_3\text{O}^+] = 6.8 \times 10^{-6} \text{ moles/L}$ .	16.) Calculate according to the correct number of decimal places: $311.9 - 42.83$
17.) Calculate the $[\text{H}_3\text{O}^+]$ when $\text{pH} = 5.85$ .	18.) Given $K_w = [\text{H}_3\text{O}^+][\text{OH}^-] = 1.0 \times 10^{-14}$ . Calculate $[\text{H}_3\text{O}^+]$ if $[\text{OH}^-] = 5.34 \times 10^{-9}$ .
19.) Village Center health care workers' earnings start at \$10.52 an hour. If the employees work 40 hours per week, what is each worker's gross weekly pay?	20.) The dietician serves a protein dish at three meals. If the total daily grams of protein are 225.9 grams, assuming that the grams are equally divided for the three meals a day, what is the average meal's gram of protein?