

## Unit 4 Evaluation: Exponential & Logarithmic Functions

Max Marks: 28

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

**Part A: Short Answer.**

1. a) Write in logarithmic form  $x = (5)^y$       b) Write in exponential form  $u = \log_a v$       [2]
2. Evaluate.      [2]
- a)  $\log 1000$       b)  $\log_4 32$

**Part B: Extended Response.** *Answer questions on separate paper. Marks earned for steps shown.*

1. Evaluate to two decimal places.  $\log_3 16$       [1]
2. Solve for  $x$ . (Round to the nearest thousandth where necessary.)      [10]
- a)  $5^x + 3 = 47$
- b)  $\log_3 \sqrt{x} - \log_3 2 = \log_3 5$
- c)  $\log_2(x-3) + \log_2 x = 2$
3. A culture has 750 bacteria. The number of bacteria doubles every 3 days.      [5]
- a) How many bacteria are in the culture after 12 days?
- b) How many days would it take to have one million bacteria? (Assuming none die.)
4. In a nuclear test explosion, 45g of strontium-90 are released. This element has a half life of 28 years. How many grams of strontium-90 remain after 80 years?      [3]
5. What is the pH level of white vinegar if it has concentration of hydrogen ions ( $H^+$ ) of 0.0042?      [1]
6. Graph  $y = 2 \log_2(x-1) + 1$       [4]

**Bonus1:** Spell your math teachers last name correctly. [+1]**Bonus2:** Type/Write out a unique math joke that involves logarithms. [+1]**Bonus3:** Find the value of base  $x$ , given  $\log_x 4 - \log_x 16 + \log_x 32 = 3$ . [+1]