Applications of exponents

A. Choose the correct answer:

- 1. Which of the following represents one million in exponential form?
 - a) 10³ b) 10⁶
 - c) 10⁴ d) 10⁹

2. 5⁶ represents

- a) A small number b) A negative number
- c) A very large number d) A fraction
- 3. Which of the following is a correct exponential form of $\frac{1}{1000}$?
 - a) 10³ b) 10⁻²
 - c) 10⁻³ d) 10^o

4. What is the exponential form of $\frac{1}{81}$?

- a) 3⁴ b) 9² c) 3⁻⁴ d) 3⁻³
- 5. Which of the following uses negative exponents?
 - a) $2 \times 2 \times 2$ b) 10^{-2} c) 3^{2} d) 5×5

B. Write the Missing Terms to Complete the Sentences:

1. The standard form of 10⁴ is _____.

2.
$$\frac{1}{10000} = 10^{-100}$$

- 3. Exponents help in expressing _____ numbers in a compact form.
- 4. Astronomers use powers of _____ to express very large distances.
- 5. A very small number like 0.001 can be written as a power of _____.

C. Mark each sentence with a True (✓) or False (X):

1. Exponents are not used in expressing large numbers

2.
$$10^{-3} = \frac{1}{1000}$$

- 3. 1000 = 10⁵
- 4. 2^o = 1
- 5. Exponents are useful in fields like science and engineering

D. Figure out the answers to these questions:

- 1. Write 1000000 using exponential notation and explain how it is useful in reallife situations.
- 2. Express $\frac{1}{100000}$ in exponential form and mention one area where this might be used.
- 3. A computer has 2¹⁰ bytes in a kilobyte. Find the total number of bytes in 2 kilobytes.
- 4. Convert the number 0.0001 into exponential form and explain its significance.
- 5. In scientific work, the mass of an atom is 1.6×10^{-24} grams. Express 1.6×10^{-24} using words and explain the use of exponents here.

E. Challenge yourself with these questions:

- 1. Write $\frac{1}{1000000}$ using exponential form with base 10.
- 2. Convert 1000000000 to exponential form and name its use in daily life.
- 3. Write the value of (2×10^6) in standard form.
- 4. If a scientist writes the mass of an object as 5 × 10⁻⁵ grams, what is its value in decimal?
- 5. A light-year is approximately 9.46×10^{12} km. Express 2 light-years in exponential notation.