NUMBER SYSTEM – LOGARITHMS (BASICS → PLACEMENT LEVEL)

1. WHAT IS A LOGARITHM?

A logarithm is the inverse operation of exponentiation. It answers the question: To what power should a base be raised to obtain a given number? Logarithms are frequently asked in placement aptitude to test conceptual clarity.

If a■ = b, then log■(b) = x. Here, 'a' is the base, 'b' is the number, and 'x' is the logarithmic value.

2. BASIC LOGARITHMIC VALUES

- log■■(1) = 0
- log■■(10) = 1
- log■■(100) = 2
- log■(2) = 1
- log■(8) = 3

3. LAWS OF LOGARITHMS (MUST REMEMBER)

- Product Law: log■(MN) = log■M + log■N
- Quotient Law: log■(M/N) = log■M – log■N
- Power Law: log■(M■) = n log■M
- log■(a) = 1
- log■(1) = 0

4. SOLVED EXAMPLES

- Example 1: log■■(1000) = 3 because $10^3 = 1000$
- Example 2: log■(16) = 4 because 2■ = 16
- Example 3: log■■(5 × 20) = log■■(100) = 2
- Example 4: log■(27) – log■(9) = 3 – 2 = 1
- Example 5: log■(32) = 5

5. COMMON MISTAKES TO AVOID

- Using different bases incorrectly
- Forgetting that log■(1) = 0
- Applying log rules without checking base
- Trying to calculate instead of converting to powers

6. PRACTICE QUESTIONS (HOMEWORK)

- 1. Find the value of log■■(10000)
- 2. Find the value of log■(64)
- 3. Simplify: log■■(4 × 25)
- 4. Evaluate: log■(81) – log■(3)
- 5. Find the value of log■(125)

7. ANSWERS (FOR SELF-CHECK)

- 1. 4
- 2. 6
- 3. 2
- 4. 3
- 5. 3