Exponents and Powers

1. If a is a non-zero rational number and n is a natural number, then the product $\underbrace{a \times a \times a \times ..... \times a}_{(n\ times)}$ is denoted by a^n and is read as 'a raised to the power n'. Rational number 'a' is called the base and natural number n is known as the exponent. Also, a^n is known as the exponential form $\underbrace{a \times a \times a \times ..... \times a}_{(n\ times)}$

2. For any non-zero rational number, we have $a^0 = 1\ and\ a^1 = 1.$

3. If a and b are non-zero rational numbers and m and n are natural numbers, then following are the laws of exponents:

(i) $a^m \times a^n = a^{m+n}$

(ii) $\frac{a^m}{a^n} = a^{m-n}, (m > n)$

(iii) $\left(a^m\right)^n = a^{mn} = \left(a^n\right)^m$

(iv) $(a \times b)^n = a^n b^n$

(v) $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$