Important Calculations

① Squaring methods :

i) Nos. with unit digit 5

$(n5)^2 = \underline{n \times (n+1)} \ \underline{25}$

Practice : 35, 45, 65, 85, 105, 115, 125, 205

ii) $(ab)^2 = \underline{a^2} \ \underline{2ab} \ \underline{b^2}$

Practice : 34, 73, 63, 81, 37, 67, 84, 103, 107, 132, 213, 614

iii) Base method :

a) Base 100 :

$(100 \pm x)^2 = (100 \pm 2x) \ \underline{x^2}$

Practice : 103, 96, 104, 107, 112, 117, 123
97, 93, 92, 89, 78

b) Base — multiple of 100 :

$(200 \pm x)^2 = 2 \times (200 \pm 2x) \ \underline{x^2}$

$(300 \pm x)^2 = 3 \times (300 \pm 2x) \ \underline{x^2}$

$(150 \pm x)^2 = \frac{3}{2} \times (150 \pm 2x) \ \underline{x^2}$

$(50 \pm x)^2 = \frac{1}{2} (50 \pm 2x) \ \underline{x^2}$

$= (25 \pm x) \ \underline{x^2}$

Practice : 206, 211, 196, 307, 409, 156, 362, 439
53, 57, 62, 71, 48, 46, 42, 38

$(100n \pm x)^2 = n \times (100 \cdot n \pm 2x) \ \underline{x^2}$

c) Base 1000 :

$$(1000 \pm x)^2 = (1000 \pm 2x) \underline{} \underline{\underline{x^2}} \underline{}$$

$$(500 \pm x)^2 = \frac{1}{2}(500 \pm 2x) \underline{\underline{x^2}}$$

$$(2000 \pm x)^2 = 2(2000 \pm 2x) \underline{\underline{x^2}}$$

Practice: 1009, 993, 2013, 1503

Cubing :

$$(a \ b)^3 = \underline{a^3} \quad \underline{3a^2b} \quad \underline{3ab^2} \quad \underline{b^3} \qquad \text{OR} \quad ab \times ab \times ab$$

Practice: 23, 31, 41, 52, 103, 205

Square root of perfect squares :

1156, 1444, 1849, 5184, 4624, 4096, 7396, 3481,

12996, 19044

Cube root of perfect cubes :

32768, 4096, 97336, 300763, 941192, 373248,

1404928

Multiplication with 9's & 1's :

Practice : 32×11, 53×11, 72×11, 85×11, 96×11, 132×11,

253×11, 1342×11, 2453×11

Practice : 32×99, 154×999, 47×99, 253×999,

5372×9999

Must remember calculations :

i) Tables up to 25

ii) Squares up to 30 & $36^2 = 1296$

iii) Cubes up to 15 & $21^3 = 9261$

iv) 0 .... $(2^{12}, 2^6, 4^6, 5^5, 4)$

iii) Cubes up to 15 & $21^3 = 9261$

iv) Powers up to $\left(2^{12}, 3^6, 4^6, 5^5, 6^4\right)$

v) Pythagorean triplets

vi) % vs fractions

vii) $\sqrt{2} = 1.414$, $\sqrt{3} = 1.732$, $\sqrt{5} = 2.236$