$(1,0,5,6)^{n}$ ⟶ No change

$(2,3,7,8,4,9)^{\frac{n}{4}}$ R = ?

⟶ Change

① $2^{\frac{67}{4}}$ R = 3 ⟶ unit digit $2^3 = 8$

② $(1729)^{\frac{122}{4}}$ R = 2

U.D $= 9^2 = 8$ ①

$2^1 = 2$
$2^2 = 4$
$2^3 = 8$
$2^4 = 16$

$2^5 = 32$
$2^6 = 64$
$2^7 = 128$
$2^8 = 256$

③ $(1728)^{\frac{12343}{4}}$ R = 3 ✓

U.D = $8^3 = 512$

1, 0, 5, 6 का last digit ✓

(Even)^4 → 6 (U.D)

(odd)^4 → 1

④ $(132)^{\frac{64}{4}}$ R = 0 → U.D $2^4 = 16$

⑤ $(137)^{\frac{12348}{4}}$ R = 0 → $7^4 = 7 \times 7 \times 7 \times 7$

49×49 → U.D 1

⑥ $(12393)^{\frac{48232}{4}}$ ✓ R = 0 → U.D $3^4 = 1$

Note. → हमेशा 4 power बाद Repeat करता है।

① $1^{\frac{17}{4}} + 2^{\frac{17}{4}} + 3^{\frac{17}{4}} + 4^{\frac{17}{4}} + 5^{\frac{17}{4}} + 6^{\frac{17}{4}} + \cdots\cdots + 33^{\frac{17}{4}}$ का इकाई अंक निकालो।

$1^1 + 2^1 + 3^1 + 4^1 + \cdots\cdots + 33^1$

$1 + 2 + 3 + 4 + \cdots\cdots + 33 = \frac{n(n+1)}{2} = \frac{33 \times 34^{17}}{2}$

② $1^{\frac{66}{4}} + 2^{\frac{66}{4}} + 3^{\frac{66}{4}} + 4^{\frac{66}{4}} + \cdots\cdots + 21^{\frac{66}{4}}$

$1^2 + 2^2 + 3^2 + 4^2 + \cdots\cdots + 21^2 = \frac{n(n+1)(2n+1)}{6} = \frac{7 \times 22 \times 43}{6}$

$n = 21$

$= 33 \times 17 \rightarrow$ U.D ①

U.D ①

$= 77 \times 43$

U.D ①

③ $1^{\frac{127}{4}} + 2^{\frac{127}{4}} + 3^{127} + 4^{127} + \cdots\cdots\cdots + 24^{127}$

$1^3 + 2^3 + 3^3 + 4^3 + \cdots\cdots\cdots + 24^3 = \left[\frac{n(n+1)}{2}\right]^2$

$\left[\frac{24^{12} \times 25}{2}\right]^2$

④ $0 + 1 + 2 + 3 + \cdots\cdots\cdots + 24$

$\longrightarrow \frac{n(n+1)}{2} = \frac{24^{12} \times 25}{2}$

$12 \times 25 \rightarrow 0$ (U.D)

$\left[12 \times 25\right]^2$

10

U.D $\neq 0$

R=0

⑤ $1^{64} + 2^{64} + 3^{64} + 4^{64} + 5^{64} + 6^{64} + 7^{64} + 8^{64} + 9^{64} + 10^{64}$ → U·D → 3

Special case

$1^4 + 2^4 + 3^4 + 4^4 + 5^4 + 6^4 + 7^4 + 8^4 + 9^4 + 10^4$

$1 + 6 + 1 + 6 + 5 + 6 + 1 + 6 + 1 + 0 = 33$

R=0

⑥ $1^{72} + 2^{72} + 3^{72} + \dots + 40^4 + 41^{72}$

④ × 3

$1^4 + 2^4 + \dots + 10^4 + 11^4 + \dots + 20^4 + 21^4 + \dots + 30^4 + 31^4 + \dots + 40^4 + 41^4$

③ ③ ③ ③ +1

13 ✓

$R=0$

$$\# \quad 1 + 2^{1232} + 3^{1232} + 4^{1232} + \cdots\cdots\cdots + 78^{1232}$$

$$\left[1^4 + 2^4 + 3^4 + \cdots\cdots\cdots + 78^4 + 79^4 + 80^4\right] - 79^4 - 80^4$$

8×3

$24 - 1 - 0$

23

44. What is the unit digit of $(2487)^{7227}$?

$(2487)^{7227}$ का इकाई अंक क्या है?

$7227 \div 4 = 3$

$7^3 = 343$

(A) 4
(B) 2
(C) 3
(D) 7

45. The unit digit of $(2938)^{46285}$ is –

$(2938)^{46285}$ का इकाई अंक है–

(A) 6

(B) 4

(C) 8

(D) 5