concept

① $1^1 \times 2^2 \times 3^3 \times 4^4 \times 5^5 \times 6^6 \times \cdots\cdots\cdots \times 20^{20}$ में शून्यों की सं० निकालें।

5^5 10^{10} 15^{15} 20^{20}

$25^{25} \Rightarrow (5^2)^{25} = 5^{50}$

$5 + 10 + 15 + 20 = 50$ Ans.

② $1^1 \times 2^2 \times 3^3 \times 4^4 \times 5^5 \times \cdots\cdots\cdots \times 27^{27}$

5^5 10^{10} 15^{15} 20^{20} 25^{25}

$5 + 10 + 15 + 20 + 50 = 100$ Ans.

③ $1^1 \times 2^2 \times 3^3 \times 4^4 \times 5^5 \times 6^6 \times \cdots\cdots\cdots \times 39^{39}$

5^{5} 10^{10} 15^{15} 20^{20} 25^{25} 30^{30} 35^{35}

$5 + 10 + 15 + 20 + 50 + 30 + 35 = 165$ Ans.

③ $1^1 \times 2^2 \times 3^3 \times 4^4 \times 5^5 \times 6^6 \times \cdots\cdots \overset{35}{35} \overset{39}{\times 39}$

II-method

$\frac{n(n+1)}{2}$

$[5+10+15+\cdots\cdots+35] + 25$ (Extra)

$5[1+2+3+\cdots\cdots+7] + 25$

$5 \times \frac{7 \times \overset{4}{8}}{2} + 25$

$5 \times 7 \times 4 + 25$

$140 + 25 = 165$

$\#\ 1^1 \times 2^2 \times 3^3 \times 4^4 \times 5^5 \times \ldots 25^{25} \ldots\ldots 50^{50} \ldots\ldots 75^{75} \times 76^{76}$

$[5 + 10 + 15 + \ldots\ldots\ldots + 75] + \underset{\text{Extra}}{25+50+75}$

$5 \times [1+2+3+\ldots\ldots\ldots+15] + 150$

$\uparrow \frac{n(n+1)}{2}$

$5 \times \frac{15 \times \overset{8}{\cancel{16}}}{\cancel{2}} + 150$

$600 + 150 = 750$ Ans.

$1^1 \times 2^2 \times 3^3 \times 4^4 \times 5^5 \times \cdots 25^{25} \cdots 50^{50} \cdots 75^{75} \cdots 100^{100} \cdots \times 104^{104}$ में शून्यों की सं० निकालें।

$$[5+10+15+\cdots\cdots+100] \quad \text{Extra} \; +25+50+75+100$$

$$5 \times [1+2+3+\cdots\cdots+20] + 250 \qquad \frac{n(n+1)}{2}$$

$$5 \times \frac{\overset{10}{\cancel{20}} \times 21}{\cancel{2}} + 250$$

$$1050+250=1300$$

05. Find number of zeros in the end of $1^3 \times 2^4 \times 3^5 \ldots\ldots 26^{28}$

$1^3 \times 2^4 \times 3^5 \ldots\ldots 26^{28}$ के अंत में शुन्यकों की संख्या क्या होगी।

(a) 100 (b) 112 (c) 125 (d) 128

$1^3 \times 2^4 \times 3^5 \times 4^6 \times 5^7 \times 6^8 \times 7^9 \times 8^{10} \times 9^{11} \times 10^{12} \times \cdots\cdots \times 15^{17} \times \cdots\cdots \times 20^{22} \times \cdots\cdots \times 25^{27} \times 26^{28}$

5^{54}

$5^7 \quad 10^{12} \quad 15^{17} \quad 20^{22} \quad 25^{27}$

$7 + 12 + 17 + 22 + 54 = 112$

06. Find number of zeros in the end of $1^{20} \times 2^{20} \times 3^{20} \times 4^{20} \times \ldots\ldots\ldots 38^{20}$.

$1^{20} \times 2^{20} \times 3^{20} \times 4^{20} \times \ldots\ldots\ldots 38^{20}$ के अंत में शुन्नकों की संख्या क्या होगी।

(a) 160 (b) 180 (c) 150 (d) 120

5^{20} 10^{20} 15^{20} 20^{20} 25^{20} 30^{20} 35^{20}

5^{40}

$20+20+20+20+40+20+20=160$

unit digit (इकाई अंक)

Unit digit → 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

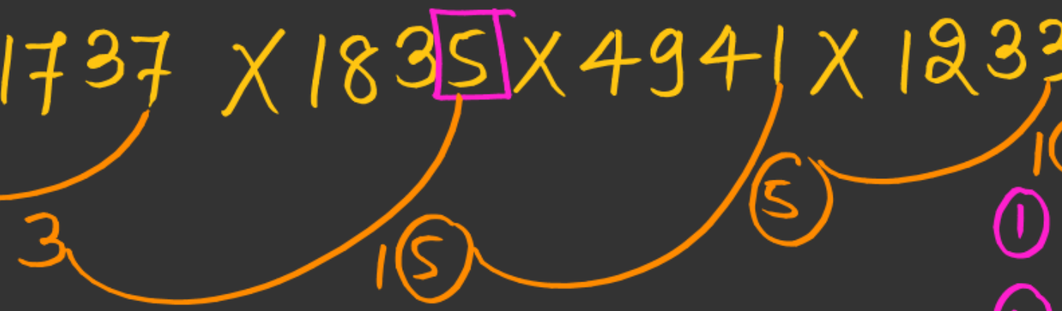
① $723 \times 528 \times 1732 \times 1924 \times 1837$

Unit digit = 4

(i) 5 x विषम सं० → 5

(ii) 5 x सम सं० → 0

729 X 1737 X 1835 X 4941 X 1233 → Unit digit → 5 Ans.



(i) 5 x odd no → 5

(ii) 5 x Even no. → 0

429 x 531 x 453 x 735 x 823 x 324 x 727 → 0

5 x Even = 0

$(1,0,5,6)^{n}$ → unit digit no change

$(\ldots\ldots 1)^{n} \longrightarrow$ U.D 1

$(\ldots\ldots 0)^{n} \longrightarrow 0$

$(\ldots\ldots 5)^{n} \longrightarrow 5$

$(\ldots\ldots 6)^{n} \longrightarrow 6$

① $(13726)^{1943} \longrightarrow$ U.D 6

$(75)^{1248} \xrightarrow{\text{U.D}} 5$

$(21)^{15329} \longrightarrow 1$

$(20)^{49} \longrightarrow 0$

9AM to 12PM

Sat. ✓

Sun. ✓

Y.t

kgs SSC Exams.