

## GATE

1. Workbook + Gate Book (Must)
2. Theory Book
3. Sheet
4. Anihant Quantum CAT

## ESE

1. Workbook + CSAT Paper I (2010-2016) (Must)
2. All UPSC paper

## REASONING & APTITUDE

Question:- Overall there are 100 balls out of which 99 balls of good quality having weight 10 gm each and 1 ball having weight 9 gm. What will be minimum no. of weighing required on beam balance to find faulty ball?

Solve:- Minimum No. of weighing required =  $3^n$   
in beam balance

$$1 - 3 \longrightarrow 1$$

$$4 - 9 \longrightarrow 2$$

$$10 - 27 \longrightarrow 3$$

$$28 - 81 \longrightarrow 4$$

$$82 - 243 \longrightarrow 5$$

So for 100 balls we have to weigh 5 times.

\*\* Spring Balance =  $2^n$  = Digital Balance

$$1 - 2 \longrightarrow 1$$

$$3 - 4 \longrightarrow 2$$

$$5 - 8 \longrightarrow 3$$

$$9 - 16 \longrightarrow 4$$

# Minimum  $\rightarrow$  Always to ensure an answer [in worst case.]

## NUMBER SYSTEM

# Factors :- Factors are the set of no. which will divide a given no. completely. — Divisor

Example :-

72 — 12 factors

1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72

$$72 = 2^{\textcircled{3}} \times 3^{\textcircled{2}}$$

$$\begin{array}{r|l} 2 & 72 \\ \hline 2 & 36 \\ 2 & 18 \\ 3 & 9 \\ 3 & 3 \\ \hline & 1 \end{array}$$

for factors  $(3+1) \times (2+1) = 4 \times 3 = 12$

$$\begin{array}{l} N = a^p \times b^q \times c^h \\ T_f = (p+1)(q+1)(h+1) \end{array}$$

Where  $a, b, c$  are distinct prime numbers.

$p, q, h$  are natural numbers.