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Apptitude :- Important unit

- Percentage
- Number System
- Profit & loss
- Ratio & Proportion
- Time work
- Time distance
- HCF - LCM
- Simplification
- Avg
- Permutation & Combination
- Probability

Reasoning Important unit

- Analogy
- Direction test
- Blood relation
- Number Series
- Letter Series
- coding- decoding
- odd one out
- Sitting Arrangement
- Venn diagram
- Assumption, Statement & Conclusion
- Spotting out the embedded fig

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Percentage :-

$x\% = x/100$ → Percentage

$20\% \rightarrow \frac{20}{100} \rightarrow \frac{1}{5}$

$$\text{Profit \%} = \frac{\text{Profit}}{CP} \times 100$$

$$\text{Loss \%} = \frac{\text{Loss}}{CP} \times 100$$

- if any value p inc by x% then increa value = (100+x)% of P
- if any value of P dec by x% then dec value (100−x)% of P

$\frac{1}{2} \rightarrow 50\%$
$\frac{1}{3} \rightarrow 33.33\%$
$\frac{1}{4} \rightarrow 25\%$
$\frac{1}{5} \rightarrow 20\%$
$\frac{1}{6} \rightarrow 16.66\%$
$\frac{1}{7} \rightarrow 14.25\%$
$\frac{1}{8} \rightarrow 12.5\%$
$\frac{1}{9} \rightarrow 11.11\%$
$\frac{1}{10} \rightarrow 10\%$

16% of 175

$\frac{4}{25} \times 175 \times 20 =$

Percentage Comparision (% more, % less, of)

A is what % of B $\frac{A}{B} \times 100$

A is what % less than B =

$$\frac{\text{diff}}{\text{more}} \times 100$$

B is what % more than A =

$$\frac{\text{diff}}{\text{less}} \times 100$$

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Number System:-

- divisible by if unit digit any 0, 2, 4, 6, 8
- when the sum of its digit is divisible by 3
  eg: 695421 sum of digit = 27 which is divible by 3
- number is divible by 9 when sum of its digit divible by 9 eg - 246591 sum of digit = 27, which is divible by 9
- A number is divisible by 4, if no formed by its two digit divisible by 4
  eg - 6879376, since 76 is divible by 4
- A number is divisible by 8, if no formed by its three digit divible by 8
  eg - 16789352, since 352 divible by 8
- A number is divisible by 10, when its unit digit is 0
- A number is divisible by 5, when its unit digit is 0, 5
- no is divisible by 11, difference between sum of digit at odd places
  eg → 29435417
  (Sum of odd places) - (Sum of even places)
  (7 + 4 + 3 + 9) - (1 + 5 + 4 + 2)
  23 - 12 = 11
- when divisible by 25 if the no. formed by its last two digit is either 00 or divisible by 25
  63075 divide by 25
- divisibility by 7 or 13:
  divide the no into grp of 3 digit (starting from right) and find diff

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between the sum of odd and even places.

eg → 4537792 → 4 | 537 | 792

(792 + 4) − 537 = 259 which is divisible by 7

* Factorial

n be the int

$n! = n(n-1)(n-2)\ldots$

* Modulus

$|x| = \begin{cases} x & \text{when } x \geq 0 \\ -x & \text{when } x \leq 0 \end{cases}$

$|-5| = 5$

* Multiplion by shortcut methods

• $a \times (b + c) = ab + ac$

eg- $567958 \times 99999 = 567958 \times (100000 - 1)$

$= 567958 \times 100000 - 567958 \times 1$

$= (56795800000 - 567958)$

$= 56795232042.$

• $a \times (b - c) = a \times b - a \times c$

* Divide Algo & Euclidean Algorithm

Dividend = (Divisor × Quotient) + Rem

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Profit & Loss :-

CP = Cost price, SP = Selling price, MP = Market price

SP = ∴ price at which article is sold

Profit & Gain = if SP is greater than CP. then seller is said to have profit & gain

Loss = if SP is less than CP, then seller said to have incurred loss

* Gain = SP − CP
* gain% = $\left(\frac{\text{Gain} \times 100}{CP}\right)$
* SP = $\left(\frac{100 + \text{gain\%}}{100}\right) \times CP$
* CP = $\frac{100}{100 + \text{gain\%}} \times SP$
* Loss = CP − SP
* loss % = $\left(\frac{\text{Loss} \times 100}{CP}\right)$
* SP = $\left(\frac{100 - \text{loss\%}}{100}\right) \times CP$
* CP = $\frac{100}{100 - \text{loss\%}} \times SP$

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Ratio & Proportion :-

$\frac{a}{b} = a:b$ → Ratio

Rule :- mul or div of each term of ratio by same non-zero number does not affect the ratio

$4:5 = 8:10$

Proportion : The equality of two ratio is called proportion

$a:b = c:d$

We can write, $a:b :: c:d$, so we can say that a, b, c, d are in proportion

a, d → exterms

b, c → mean term

Product of mean = Product of exterms

$a:b = c:d \Rightarrow (b \times c) = (a \times d)$

Comparision of Ratio = $a:b > c:d$

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Time & work :-

★ if A can do a piece of work in n days then, A's 1 day's work = $\frac{1}{n}$

★ A's 1 day's work = $\frac{1}{n}$ then A can finish the work in n days

★ If A is thrice as good a workman as B

Ratio of work done by A and B = 3 : 1
Ratio of time taken by A and B finish a work = 1 : 3

Q- A and B together can complete a piece of work in 15 days and B alone in 20 days. In how many days can A alone complete the work?

(A+B)'s 1 days of work = $\frac{1}{15}$
B's 1 days work = $\frac{1}{20}$

A's 1 day's work = $\left(\frac{1}{15} - \frac{1}{20}\right) = \frac{1}{60}$ days

A can complete an work alone in 60 days

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Time & distance

Speed = Distance / Time

Distance = Speed × time

Time = distance / Speed

x km/hr $= \left(x \times \frac{5}{18}\right)$ m/sec

x m/sec $= \left(x \times \frac{18}{5}\right)$ km/hr

A train travel 82.6 km/hr. how many meter will travel in 15 min?

dis travell in 1 min $\frac{82.6}{60}$

dis travel in 15 min $= \frac{82.6}{60} \times 15$

$= 20.65$ km.

$= (20.65 \times 1000)$ m

$= 20650$ m.

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HCF & LCM :-

HCF is Highest Comman factor

LCM is least Comman multiple

* The Greater number that divide each of them exactly.
* The least number which is exactly divisible by each one of the number

* Product of two number = Product of their HCF and LCM

* $\text{HCF} = \frac{\text{HCF of Num}}{\text{LCM of deno}}$

* $\text{LCM} = \frac{\text{LCM of num}}{\text{HCF of deno}}$

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Simplification :-

BODMAS.

B = Bracket , O = Of , D = Division
M = Multiplication , A = Addition , S = Sub

* Simplifying an expression, first of all remove all the brackets strictly in order ( ), { } and [ ]
After removing brackets operation are solve in order
i) Of ii) Division iii) Multiply iv) Add
v) Sub

Q → $1 \div [1 + 1 \div \{1 + 1 \div 1(1 + 1 \div 2)\}] + 1$

$1 \div [1 + 1 \div \{1 + 1 \div 3/2\}] + 1$

$1 \div [1 + 1 \div \{1 + 1 \times 2/3\}] + 1$

$1 \div [1 + 1 \div \{1 + 2/3\}] + 1$

$1 \div [1 + 1 \div 5/3] + 1$

$1 \div [1 + 1 \times 3/5] + 1$

$1 \div [1 + 3/5] + 1$

$1 \div 8/5 + 1$

$1 \times 5/8 + 1 \Rightarrow 13/8$

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Average :-

* **Avg = Sum of observation / No. of observation**

Suppose, A man cover a certain distance at x kmph and equal distance at y kmph then, the avg speed during whole Journey $\left(\frac{2xy}{x+y}\right)$ kmph

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Permutation and Combination

$\underline{n} = n(n-1)(n-2)\ldots$

$\underline{3} = 3 \times 2 \times 1 = 6$

$\underline{0} = 1$

Permutation - The different arrangement of given no. of things
ex a, b, c by two at time
(ab, ba, ac, ca, bc, cb)

Combination - Each of the different grp or selection which can be formed by taking some or all at time
eg - out of three boys A, B, C we want select two
possible selection (AB, BC, CA)

Number of permutation of n things taking r at a time

$${}^nP_r = n(n-1)(n-2)\ldots(n-r+1) = \frac{\underline{n}}{\underline{n-r}}$$

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Probability :- (संभावना)

Experiment - An opration which can produce some well-defined outcome is called experiment

Random Experiment - all posible outcome are know and the exact output cannot be predicted in advanced.

Example of Performing a random experiment
- Rolling an dice
- Tossing coin
- drawn card
- Pick up ball of certain color from bag

Event - Any subset of a Sample Space

Probability of occurence of an event

$$P(E) = \frac{n(E)}{n(S)}$$

S be the Sample Space and E be an event

$E \subseteq S$

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Reasoning :-

Direction Test