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GENERAL APTITUDE

- 7-8M in Gate [Equivalent to CN]

(1) RATIO & PROPORTION

- Comparison of 2 same/eq quantities

$a:b$ → consequent (imp)
→ antecedant

- Inverse of $a:b = 1/a : 1/b = b:a$
  Ratio
- TR of $a:b:c = 1/a : 1/b : 1/c$
  $\Rightarrow bc : ac : ab$

- Duplicate ratio of $a:b = a^2 : b^2$
- Subduplicate ratio of $a:b = \sqrt{a} : \sqrt{b}$
- Triplicate ratio of $a:b = a^3 : b^3$
- Subtriplicate ratio of $a:b = \sqrt[3]{a} : \sqrt[3]{b}$

- Compound ratio $a:b, c:d, e:f$

$\Rightarrow \frac{a \times c \times e}{b \times d \times f}$ (imp)

* Proportion : $[a:b :: c:d]$ $\frac{a}{b} = \frac{c}{d}$

- 4th Proportion : $d = bc/a$
- 2nd Proportion : $b^2 = ac$

a → first Prop, b → Second Prop,
c → third Prop, d → Fourth prop.

PROPORTIONS

* a:b = 7:8
b:c = 4:5
then, a:b:c = ?

a b c (imp)
7 8
4 5

28 : 32 : 40
⇒ 7 : 8 : 10

* if a:b, b:c, c:d given
find a:b:c:d ?

(imp) →

a : b
b : c
c : d
abc : bbc : bcc : bcd

eg → Pg 7 (Q 1) [1cm → 10 Km]

eg → Pg 7 (Q 2) [difference]

eg → Pg 7 (Q 4) (Vessel of 48 l pure alcohol)

eg → Pg 7 (Q 5) (2 Vessels of Eq. Capacity) (imp)

* ₹1390 is divided among 600 B & G. Each B gets ₹2.5 & each girl gets ₹2. Find the no. of boys exceed the no. of girls.

B
600 × 2.5
1500 ₹

G
600 × 2
1200 ₹

1390 ₹

190 ₹ : 110 ₹
∴ 19 : 11 ⇒ 8/30 × 600 ⇒ 160

(imp) → Mixture Alleg Method

eg → Pg 11 (Q 6) (Mixture)

eg → Pg 11 (Q 3) (Con. Ratio / Val. Ratio) [how much wtr 50 p make?] (imp)

2 no.s in ratio 4:5
20 added to each no, ratio = 8:9

4 : 5
4P ( ) + 20 ⇒ 4P = 20; P = 5
8 : 9

∴ (20, 25) → original no.s

eg → Pg 11 (Q 5) same concept. [Vimp]

* HANDOUT PROBLEMS.

eg → Pg 18 / H-4 [Sim. Concept as above]

eg → Pg 19 / Q 8/3

eg → Pg 20 (Q 10) [Batallion Q]

eg → Pg 20 (Q 11) [Value R / Coin R] (imp)

Q What must be added to 2 no.s in the ratio 3:4, to make it into 4:5.

$\frac{3x+y}{4x+y} = \frac{4}{5}$ ∴ Data inadequate

But, find the no. which when sub from terms of ratio 19:23 make it equal to ratio 3:4. (imp)

$\frac{19-x}{23-x} = \frac{3}{4}$

eg → Pg 21 [Q 14] [Wage of employee before & after]

eg → Pg 22 [Q 16] (2:3:5 $\xrightarrow{20}$ 4:5:7)

$20 = 2p$, $p = 10$

Q Gayatri, Savani : 6:5
Sum of age = 44 years
Ratio of age after 8 years.

∴ 11p = 44

or, p = 4, Age = 24, 20.
(Age + 8) = 32, 28
⇒ 8:7

Part Method (imp)

eg → Pg 24 [Q 22] (Part Method)

eg → Pg 25 [Q 26]

eg → Pg 26 [Q 29] (imp)

Income R = 6x, +y
Exp = 8y, 5y

Income = Expenditure + Saving

(2) PERCENTAGE

- out of 100P, 1P ?

percentage $\xrightarrow{\div 100}$ fraction

fraction $\xrightarrow{\times 100}$ percentage

* Rates Problems

Q Salary of A is 10% more than B. what % of salary of B is less than that of A ?

⇒ Let B = 100, ₹ ; A = 110 (imp)

B < A
A < B
A > B
B > A

→ $\frac{\text{diff}}{\text{right Side Val.}} * 100$

⇒ $\frac{10}{110} \times 100 = 9\frac{1}{11}\%$

imp

eg → Pg 29 (Q3)

* HANDOUT PROBLEMS

eg → Pg 32 (Q1) [Price of good inc. by 30% ↑ / Sales dec. by 20% ↓]

imp

eg → Pg 33 (Q3) → Express

eg → Pg 34 (Q16)

} express Problem.

Q Population = 9000. Increase = 5% of current male pop

Next yr, male ↑ 5%, female ↑ 8%.

Total population = 9600.

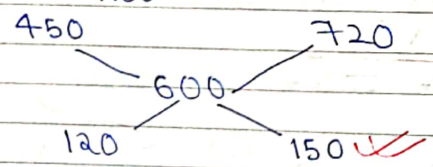
Total increase = 600.

∴ By mixed Allegation method:

imp

only males.

9000 × 5/100



⇒ 3:5 [m:f ratio]

Q. $\frac{5}{100}x + (9000-x)\cdot\frac{8}{100} = 600$.

∴ change. (x: Males, (9000−x): females)

imp

$$\%\text{change} = \frac{\text{diff}}{\text{prev. value}} * 100$$

eg → Pg 36 (Q7)

Q Soln of salt + water = 5% salt by wt

20 kg water evaporates

soln now contain 15% salt.

$\frac{5}{100} \times x = \frac{15}{100} \times (x-20)$.

eg → Pg 38 [Q12] [price of oranges]

imp

eg → Pg 38 [Q13] (Mixed Allegation)

eg → Pg 39 [Q15] (Price inc. Problem)

imp [Model Test]

Q Q.19

males = 7p, females = 8p.

$\frac{80}{100} \times 8p$ → adults.

Parts method

$\therefore \frac{80}{100} \times 8p = 156800$

$\therefore p = 24500$

⇒ Total pop = 15p = 367,500.

eg → Pg 42 (Q21) → Imp Q on Price drop

eg → Pg 42 (Q22) [Under's throw percentage]

imp

error / correct value × 100 = % error

imp

eg → Pg 74 (Q25)

14% — 420.
100% — x.

3 AVERAGE

Avg = Sum of Quantities / No of Quantities

Sum = Avg * No of Q

* HANDOUT PROBLEMS

Q Avg of 5 consecutive odd nos, A, B, C, D, E → 45.

imp

In case of odd, avg = middle no. In case of even, avg = avg of middle no.s

45

43 47

∴ B * D = 43 × 47

eg → 76, Q3 [Find teacher's age, avg increases/decreases]

eg → Pg 78 [Mixed Allegation M] [Q9]
↳ learn both methods

Q Avg age of 5 members of family = 20 yrs
Age of youngest member = 8 yrs
Avg age of family just before birth of youngest member?
⇒ 20 × 5 = 100 (Total Age)
⇒ 100 − 8·5 = 60
∴ Avg = 60/4 ⇒ 15 yrs

Q 14 / Pg 80.

ABCD + 20 = 6x.
ABCD + E = 6(x+5)
⇒ 6x − 20 + E = 6x + 30
∴ E = 50 kg

eg → Pg 76 (Q5)

4) TIME AND DISTANCE

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

* $\left[\begin{matrix}\text{Km/h} * 5/18 = \text{m/s} \\ \text{m/s} * 18/5 = \text{Km/h}\end{matrix}\right]$ conversion (imp)

* If distance is same
$$\text{Speed} \propto \frac{1}{\text{time}}$$

* Relative Speed

- if same direction; $RS = S_1 - S_2$.
- if diff direction; $RS = S_1 + S_2$.

1) TRAINS

TL → Train length
BL → Bridge length

(i) Train cross stationary man / teleph pole / tree → $D = TL$ (imp)
(iii) Train cross platform → $D = TL + BL$
(iv) Train cross another train → $D = TL + TL$

2) BOATS

Man / boat Speed = a Km/h.
river / flow / current speed = b Km/h (imp)

(i) along with water → (a+b) [Down Stream]
(ii) against water → (a−b) [Up Stream].

* HANDBOOK PROBLEMS

eg → Pg 86 (Q 4) [3/4 speed → 20 min late]

eg → Pg 87 (Q 7) [Relative Speed b/w train & crossing]

Q4 $\frac{3}{4}S$ → [numerator value ⇒ usual time]
∴ 1p = 20
usual time = 60 min (not imp)

eg → Pg 88 (Q 8) [$d = TL + BL$] (imp)

eg → Pg 89 (Q 10) [walk & ride]

eg → Pg 90 (Q 11) [Bus Stop on Avg] imp

eg → Pg 91 (Q 13) [Relative dist, Relative Speed]
- when will a train meet another train, given Speeds : Problem.

eg → Pg 92 (Q 15) [Train cross each other problem]

* Upstream & Dawnstream Problem

eg → Pg 95 (Q 20)

5] PERMUTATIONS & COMBINATIONS

- Arrangements & Selections.

$$ {}^{n}P_{r} = \frac{n!}{(n-r)!} $$

→ ${}^{10}P_{3} = 10 \times 9 \times 8$ (go upto 3 digits) imp [Trick]

* Permutation Models

(i) 1 passenger travel 1 place to another. How many diff kinds of tickets?
⇒ {A, B, C} → {AB, AC, BC, BA, CA, CB}
∴ ${}^{n}P_{2}$ [${}^{3}C_{2} * 2! = {}^{3}P_{2}$]

(ii) Row Permutations : $n!$

(iii) Circular Permutations : $(n-1)!$
[n people sit around round Table]

(iv) Garland Permutation : $(n-1)!/2$
[CW = ACW]

* Combinations

$$ {}^{n}C_{r} = \frac{n!}{(n-r)!\,r!} = C(n,r) = \left[\begin{matrix} n \\ r \end{matrix}\right] $$

⇒ ${}^{7}C_{3} = \frac{7 \times 6 \times 5}{3 \times 2 \times 1}$

$$ {}^{n}C_{0} = 1 $$
$$ {}^{n}C_{1} = n \; ; \; {}^{n}C_{n} = 1 $$

* ${}^{n}C_{r} = {}^{n}C_{n-r}$

$V(n,r) = {}^{n+r-1}C_{r}$ ← discrete Maths [Throw r similar balls on n boxes]

- non-negative integral values of: $x_1 + x_2 + \cdots x_n = r$.
- no. of terms in $(a+b+c)^n$.

* n vertices
→ No. of ways to form a triangle = ${}^{n}C_{3}$ imp

* n Sided Polygon, No of ways to form total no. of diagonals: ${}^{n}C_{2} - n$

* n People, Total no of handShakes
⇒ $^nC_2$

* n Teams Participated, total no of Games played at a place
⇒ $^nC_2 = \frac{n(n-1)}{2}$ → 1+2···(n−1)

* HANDOUT PROBLEMS

eg → Pg 101 (Q2) → [imp] [Consonants not together] (internal arrg)

eg → Pg 102 (Q5)
- Vowels occupy only odd positions

eg → Pg 103 (Q9)
- A & B never come together.

Q 4 friends go to Nainital [4 diff apples on 10 children] $^{10}P_4$
10 hotels available.
How many ways | each 1 stays in a separate hotel] (imp)
⇒ each friend 4 choices (↓)
⇒ ~~4×3×2×1~~
⇒ 10×9×8×7 = 5040

eg → Pg 104 (Q18)]5

eg → Pg 105 (Q17) [div by 4] (imp) [div by 4]

- Atleast 1 woman ⇒
(Total − No woman committee).

eg → Pg 105 (Q18)

eg → Pg 108 (Q25)
Alternate Standing of Boy and Girl.

6 PROBABILITY

P(E) → Probability
- n(E) → required events (fav. events)
n(S) → total no of events [SS]
∴ $P(E) = \frac{n(E)}{n(S)}$

⇒ $P(E) + P(\bar{E}) = 1$

(ii) Coins
n coins tossed = 2^n events (SS)

(iii) Dice
n Dice thrown = 6^n events [SS]

* PLAYING CARDS

⇒ 4 Suits {Spades (13), Club (13), Heart (13), Diam (13)}
Black, Red.

⇒ 52 cards total.

52 Cards
- 26 (Black)
  - 13 (Spades)
  - 13 (Clubs)
- 26 (Red)
  - 13 (Diamond)
  - 13 (Heart)

imp [Various Maths also]

Honor cards : {K, Q, A, J}
⇒ 4x4 ⇒ 16 cards

Face Cards : {K, Q, J}
⇒ 3x4 ⇒ 12 cards

Number Cards {2, 3, 4 ··· 10}
⇒ 9x 4 ⇒ 36 cards

∴ 36 + 16 = 52 cards

* HANDBOOK

eg → Pg 111 [Q3] (imp)
Probability of 1J, 1K, 1Q.

eg → Pg 111 [Q 4] $\frac{{}^7C_2}{{}^{12}C_2}$ (7 black balls)
Two balls are drawn. (imp)

eg → Q5 (if replaced)

Q. 5 person selected from group of 3M, 2W and 4C. What is the prob that it will contain 2C ?

$$\Rightarrow \frac{{}^5C_3 \times {}^4C_2}{{}^9C_5}$$

(Tussle)

eg → Pg 113 (Q10)
[atleast one of them correctly]

eg → Pg 114 [Q 11]
[all ribbons drawn are of same colour].

Q. 5 boys, 5 girls sit in a row. (imp)
Prob. all 5 G sit together.

$$\Rightarrow \frac{6! \times 5!}{10!}$$ → all possible Arrangem.

eg → Pg 115 (Q17) circular

eg → Pg 116 [Q18] [Prob. that both are diff. colours].

Odds in Favour = Success : Failure
Odds in Against Favour = Failure : Success.

(imp) Odds in favour of drawing 2 Kings.

$$\Rightarrow P(S) = \frac{{}^4C_2}{{}^{52}C_2} = 1/221$$

$$\frac{1}{221} : \frac{220}{221} \Rightarrow 1/220$$

eg → Pg 117 [Q20]
[Likely to agree].

7) MENSURATION

1) Polygon

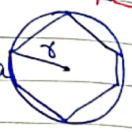
each exterior angle = $360/n$

each interior angle = $\left[180 - \frac{360}{n}\right]$

* **Polygon Area** = $\frac{na^2}{4}\cot\frac{180^\circ}{n}$ (imp)

$n \rightarrow$ no. of side

$a \rightarrow$ length of side.



⇒ In a circle, 1 regular hexagon is inscribed.

Circumcircle radius = Hexagon Side (imp)

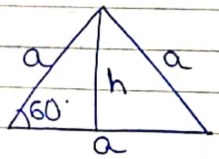
2) TRIANGLES

(i) Equilateral Δ

$P = 3a$

$A = \frac{\sqrt{3}}{4}a^2$

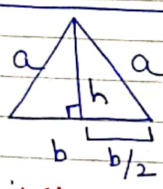
$h = \sqrt{3}a/2$



(ii) Isosceles Δ

$P = 2a + b$

$A = \frac{1}{2} \times b \times \sqrt{a^2 - \frac{b^2}{4}}$



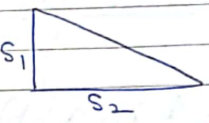
(iii) Scalene Δ

- $A = \sqrt{s(s-a)(s-b)(s-c)}$

  $s = (a+b+c)/2$
- $P = a+b+c$

(iv) Right Angled Δ

$A = \frac{1}{2}s_1 s_2$



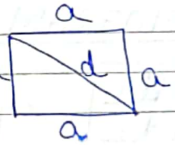
3) SQUARE

$P = 4a$

$A = a^2$.

$d = \sqrt{2}a$

[diagonal]

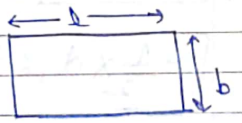


4) RECTANGLE

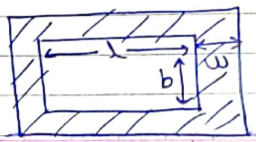
$P = 2(l+b)$

$A = l * b$.

$d = \sqrt{l^2 + b^2}$



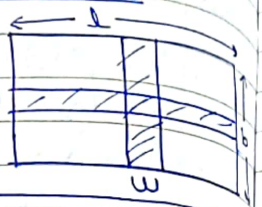
(i) Rectangle outer Path Area



OPA = $(l+2w)(b+2w) - lb$.

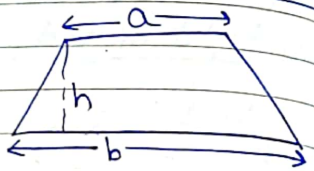
(iii) Rectangle midway Path Area

$(l \cdot w + b \cdot w) - w^2$
$= MPA$



5) TRAPEZIUM

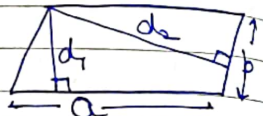
imp → $A = \frac{1}{2} h(a+b)$



6) PARALLELOGRAM

$A = a \times d_1$
$A = b \times d_2$

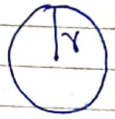
A = base x height



7) RHOMBUS

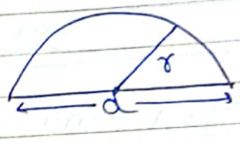
$A = \frac{1}{2} \times d_1 \times d_2$

8) CIRCLE



$A = \pi r^2$
$P = 2\pi r$
$d = 2r$

(ii) SEMICIRCLE



- $P = \pi r + d$
- $A = \pi r^2 / 2$

(iii) SECTOR

$A = \frac{\theta}{360} \times \pi r^2$ (Area of Sector).

$l = \frac{\theta}{360} \times 2\pi r$ (Length of Arc)

$C = \left[\frac{\theta}{360} \times 2\pi r\right] + 2r$ (Circumference of Sector)

* 3-Dimensions

1) Cube

$V = a^3$
LSA/CSA = $4a^2$ (Wall Areas)
TSA = $6a^2$
Diagonal = $\sqrt{a^2+a^2+a^2} = \sqrt{3}a$

2) Cuboid

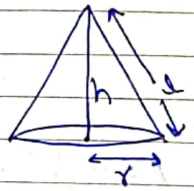
- $V = l \times b \times h$
- LSA/CSA = $2h(l+b)$.
- TSA = $2(lh + lb + bh)$.
- diagonal = $\sqrt{l^2+b^2+h^2}$

3) Sphere : $V = 4/3 \pi r^3$
LSA/TSA = $4\pi r^2$

4) Semi/HemiSphere : $V = 2/3 \pi r^3$
LSA = $2\pi r^2$
TSA = $3\pi r^2$
imp

5) CYLINDER : $V = \pi r^2 h$
LSA = $2\pi r h$
TSA = $2\pi r h + 2\pi r^2$

6) CONE



$l = \sqrt{r^2 + h^2}$

- $V = 1/3 \pi r^2 h$
- LSA = $\pi r l$
- TSA = $\pi r l + \pi r^2$ ✓ l → Slant ht

* HANDOUTS

eg → Pg 145 (Q2)

eg → Pg 146 (Q5) coins touching a coin:

Area of Hexagon = $\frac{3\sqrt{3}}{2} a^2$

$\frac{na^2}{4} \cot \frac{180}{n}$

eg → Pg 147 [Q9]

$d = n \times c$

eg → Pg 148 [Revolution of Wheel] [Q15]

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Q 100 circular Plates of thickness 1/2 cm.

eg → Pg 150 [Q19]

eg → Pg 150 [Q20] imp

eg → Pg 151 [Q22] (3 tennis balls in a cylindrical jar)

8 NUMBER SERIES

2 Models:
M1: a, b, c, d, e, f, ?
M2: which is wrong?
a, b, c, x, e, f.
imp

eg → Pg 152 [Q1, Q4] imp
(Sum/diff b/w no.s)

eg → Pg 154 [Q6, Q10]
(Position dependent)

eg → Q 155 [Q12, Q13, Q15]

* Model 2

eg → Pg 156 [Q2, Q3, Q4] imp

eg → Pg 157 [Q3,]

9] Blood Relations

G-1: GM/GF.
G-2: M/F/Uncle/Aunt.
G-3: you/Brother/Sister/brother in Law/Sister in law/wife/Husband.
G-4: Son/daughter/nephew/neice

your sister's son: nephew
your wife's brother: son in law
son

eg → Pg 160 [Q 1]

eg → Pg 161 [Q 2]

10] Simple Interest

SI: Same interest every year.
CI: different interest every year.

[rate same]

SI: 10K → 1K (10%), 10K → 1K (10%), 10K → 1K (10%)
I = 1K 1K 1K.

imp

CI: [Rate is same]
10K —10%→ I=1K. A=11K
11K —10%→ I=1100

* $SI = \frac{PRT}{100}$
* $A = P + I \Rightarrow P + \frac{PRT}{100}$

$$A \Rightarrow P\left[1 + \frac{RT}{100}\right]$$

* Case 1: PTR and ptr.

i) Interest is Same:

$$P : p = \frac{1}{TR} : \frac{1}{tr}$$

imp

* Case 2: ii) Amount is Same:

$$P : p = \frac{1}{100+TR} : \frac{1}{100+tr}$$

* SI & CI.

- In CI, different interests obtained due to principle interest & interest on interest [from Q]
  ↳ R/100 × P R/100 × I
- Present years amount is next years Principle.

imp

* Compound Interest

$$A = P\left[1 + \frac{R}{100}\right]^T$$

imp

$CI = A - P$

(i) for 1 year, SI & CI (d) (difference)
$d = 0$

(ii) for 2 years:
$10^2 d = PR^2$ (imp)

(iii) ~~for~~

* HANDOUTS

$2P = \frac{PRT}{100}$

eg → Pg 49 [Q1] [Sum will triple itself]

eg → Pg 49 [Q2] (imp) [P + 4SI = 1344]
[Q3] [x + 2I = 2800 form]

eg → Pg 50 [Q4] (Mix. Allgn Method)

eg → Pg 51 [Q6] (Equal Amount Problem)

$P : p = \frac{1}{100+TR} : \frac{1}{100+t}$

$A = P\left(1 + \frac{R}{100}\right)^T$

$A = 1875\left(1 + \frac{4}{100}\right)^2$

$\Rightarrow \frac{676}{625} \times P = A$

$\frac{51}{625} \times P = CI$ (imp)

eg → Pg 54 [Q11] (imp)
[2nd year Amount became 3rd years Principle]

eg → Pg 55 [Q13]
[Divide ₹8410 b/w 2 brothers]

eg → Pg 55 [Q14] (diff. b/w SI & CI)

* SI for Sum in 3 years = 240₹

240 → 80, 80, 80 (imp)

* CI for Sum in 2 years = 170₹

170 → 80 (SI) [$\frac{R}{100} * P$], $90\left[80 + \frac{x}{100} \times 80\right]$ (Interest on Interest)

$\frac{x}{100} \times 80 = 10$

Prin. Interest

$x = 12.5$

eg → Pg 17 [Q57] [Find corresp CI, given SI]

[Find corr. SI, given CI]
[If finding corresponding SI, given CI just put 0 in units digit of CI]
∴ 157.25 → 150 (imp)
(CI) (SI)

11 TIME AND WORK

→ i) A can do a job in n days.
per day work = 1/n [Capacity]

→ Capacity ∝ 1/days. → Capacity of 1 man = 1/1000

ii) 10M — 100 days
100M — (10*100)/100 = 10 days.

iii) A → x days, (1/x) per day work.
B → y days (1/y) per day work.
∴ ((x+y)/xy) per day work of A and B.
∴ total days = xy/(x+y)

* Chain Rule:

M → man
D → days
H → hours.
W → work.

MD = md
MDH = mdh
MD/W = md/W
MDH/W = mdh/W

imp

* HANDOUTS

eg → Pg 120 [Q1] imp
1 man — 12 days
1 man — 84
∴ (1/84) per day work

1. A → x days
B → y days.
A+B = xy/(x+y) days

2. A+B → x days
A → y days
B → xy/(x−y) days

3. A → x days
B → y days
C → z days
Total days = xyz/(xy+yz+zx) imp

eg → Pg 121 [Q3]

eg → Pg 121 [Q4] [A and C absent themselves on every alternate days] imp

eg → Pg 122 [Q7] [Tank Problem]
A & B → inlet, C → outlet.

eg → Pg 123 [Q9] [Q10] imp

eg → Pg 125 [Q12]
5M+9W → 10 days = 3(2M+3W)
4M+6W → x days = 2(2M+3W)

Q 12 men —— 18 days.
12 children —— 27 days.
∴ 10 men + 12 children —— ?

12 × 18 = 12 × 27. (imp)
⇒ 12M × 18d = 12C × 27d
⇒ 2M = 3C, $1M = \frac{3C}{2}$

∴ 10M + 12C
⇒ 15C + 12C = 27C —— ? [1 day]

eg → Pg 126 [Q13]

eg → Pg 127 [Q15] (imp) (Similar to the div. of money according to amt of work done].

Q X does 3/7 work in 2 hrs.
Y works twice as fast & finish remaining work.

$\frac{3}{7}W = 2$ hrs. (imp)

∴ $\frac{3W}{7Z}$ per hr work. (X)

$\frac{6W}{7Z}$ per hr work (Y).

∴ $\frac{6W}{7Z} \times hr = \frac{4}{7}W$ ∴ $h = \frac{2}{3}Z$

eg → Pg 130 [Q17] $X+Y+Z = 18D$.
$X+Z = 2Y$
$X+Y = 3Z$.

eg → Pg 132 [Q19]

Let, assume capacity of 1 man = $1/x$.

∴ $\left[\frac{100 * 35}{x}\right] + \left[\frac{200 * 5}{x}\right] = 1$.

per day capacity of 100 men (imp) full works.

∴ $x = 4500$
⇒ 1 man ⟶ 4500 days
100 men ⟶ y
$y = 45$ days.
∴ 5 days behind Schedule.

eg → Pg 20 [132] (doing thrice as work).

$\frac{M_1 d_1 h_1}{w} = \frac{m d h}{w}$

eg → Pg 22 [Q134] (imp)

Q $\left(\frac{1}{10} + \frac{3}{47} + \frac{1}{32}\right)4 + \left(\frac{3}{47} + \frac{1}{32}\right)x + \left(\frac{1}{32}\right)3 = 1$.

[M-1 better]

12] Profit & Loss

Profit/Gain : SP − CP [SP > CP]
Loss : CP − SP [CP > SP]

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

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

eg → Pg 166 [Q3] // convert into 1 unit.

$$SP = \left(\frac{100+P}{100}\right) CP \quad ; \quad SP = \left(\frac{100-L}{100}\right) CP$$

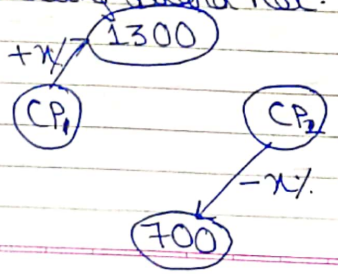
(imp)

if, $SP = \frac{100+P}{100} \times CP$ → if CP is constant & 2 SPs

$$\Rightarrow \frac{SP_1}{SP_2} = \frac{100+P_1}{100+P_2}$$ (imp)

eg → Pg 167 [Q4] // [CP is constant & given 2 SPs]

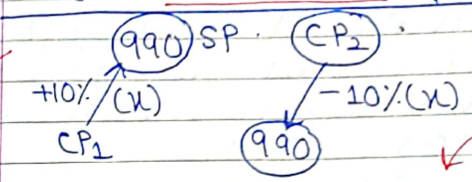
* Selling first hat: $1300 : % P (x)
Selling second hat: $700 : % L (x)



similar hats.

$$SP = \frac{100+P}{100} \times CP$$

If Similar Hats ; CP is same ⇒ CP constant : formula



Same SP, different CP, Same Profit/Loss %.

(imp) Overall loss will occur. Model

$$\text{Loss \%} = \frac{x \cdot x}{100}$$

Q A man gains SP of 11TC, by selling 33TC. What is his % Gain?

Profit = SP of 11TC (imp)
Sell. P =
∴ Profit = SP of 33TC − CP of 33TC.
⇒ SP of 11TC = SP of 33TC − CP of 33TC

CP = CP of 85 cm
SP = C.P of 100 cm

eg → Pg 173 [Q9]

eg → Pg 173 [Q10] (Man buys 100 cm Scale & Sells 85 cm of it, at the CP of 100 cm Scale).

(imp) → CP & SP in terms of items.

Date:

TEST-1 [2019]

✱ Price Change Problem ← (imp)

If price of wheat inc. by 20%, how much % a family must reduce their consumption to have no extra expense?

100₹ — 30 Kg

120₹ — 30 Kg

100₹ — x. [Same expense]

x = 25 Kg, ∴ % redⁿ = $\frac{5}{30} \times 100$

✱ In a family of 10 members, if avg. increases by 1 Kg,

Basically total increases by 10×1 Kg

[Imp]

✱ P : 8:5 (Wine : Water) ← x out

Q : 5:2 (Wine : Water) ← (1−x) out

Mix : 9:4

Find ratio in which P & Q need to be mixed? (imp)

Take 1 l of mixture

∴ $\frac{8}{13}x + \frac{5}{7}(1-x) = \frac{9}{13}(1)$

✱ Germane: Something that is relevant

Remiss: lacking care/attentⁿ to duty

✱ Panache: flamboyant confidence of style

Pangea: place/super-continent in early time

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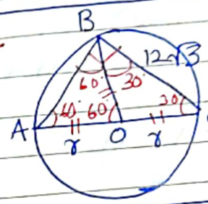
✱ Panacea: solution/remedy to all diseases. (imp)

education is panacea to all evils.

✱ 

- AC (diameter), inscribes 90° at circumference.

Given: ∠OCB = 30°

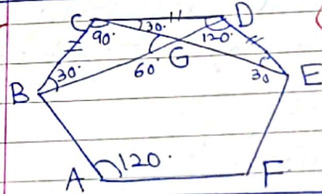
✱ They each have a relatⁿ of respect for all the others: They have respect for one another

✱ 4:3 → 5:4, x = 1p ∴ x = p

Now, Given sum of new no. = 117

∴ 9p = 117 ∴ p = 13 ⇒ x = 13

∴ No added is 13

✱ 

(imp) ∴ ∠DGE = 60

Look for Isosceles Triangle

[didn't strike in Test]

✱ HCF of 18 & 90

18 = (2×3×3)

90 = (2×3×3)×5

⇒ 18 [Method] (imp)

Scanned with CamScanner

imp

* 6 children A–F arranged in row. E must be left to F (anywhere) No. of arrangements?

M-1 Total arr. = 6! = 720.
∵ Equally likely that E is left of F or E is right of F.
∴ 720/2 = 360 ways. ✓

M-2 Take cases
E F _ _ _ _ : 1 × 4!
_ _ F _ _ _ : 2 × 4!
_ _ _ F _ _ : 3 × 4! ✓
∴ 4! (1+2+3+4+5)
⇒ 4! × 15 = 360 ✓

Q Soria invests ₹100 in account that pays 12% Annual interest compounded Quarterly. Amount, after 1 yr?

imp

P = 100, r = 12%, t = 1 yr.
Now, ∵ compounded Quarterly
→ P = ₹100, r = 12/4 = 3%, t = 1 × 4 = 4 Qua
∴ $A = P\left[1 + r/100\right]^n$
⇒ $A = 100\left[1 + \frac{3}{100}\right]^4$ ✓