

2

BLOOD RELATION

► BASIC CONCEPT

Relationship	Terms used	Relationship	Terms used
Father/Mother's son	Brother	Son's wife	Daughter-in-law
Father/Mother's daughter	Sister	Daughter's husband	Son-in-law
Mother's brother	Maternal Uncle	Sister's husband	Brother-in-law
Father's brother	Paternal Uncle	Husband's/wife's brother	Brother-in-law
Father's sister	Aunt	Brother's wife	Sister-in-law
Mother's sister	Aunt	Husband/wife's sister	Sister-in-law
Brother/Sister son	Nephew	Husband/wife's father	Father-in-law
Brother/Sister daughter	Niece	Husband/wife's mother	Mother-in-law
Uncle/Aunt's son	Cousin		
Uncle/Aunt's daughter	Cousin		
Father/Mother's Father	Grandfather		
Father/Mother's Mother	Grandmother		

► NOTATIONS

Male → □

Female → ○

Not known → use tick marks

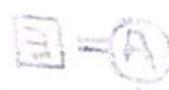
Same generation → Horizontal line

Diff. generation → Vertical line

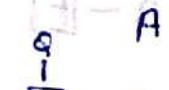
Couple → $x=y$ 

► Basic Practice

- A is brother of B
- B is sister of A
- P is son of Q
- L is M's father & M is brother of N
- X and Y are married to each other and S is sister in law of Y
- B is sister-in-law of A and mother of C



$$B - \boxed{A}$$



$$A - \boxed{B}$$



$$P - \boxed{Q}$$



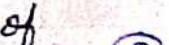
$$\boxed{M} - N$$



$$Y - \boxed{S}$$



$$\boxed{Y} - X = Y$$



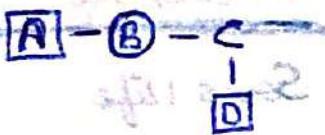
$$X - \boxed{S} = X$$



$$\boxed{C} - B = A$$

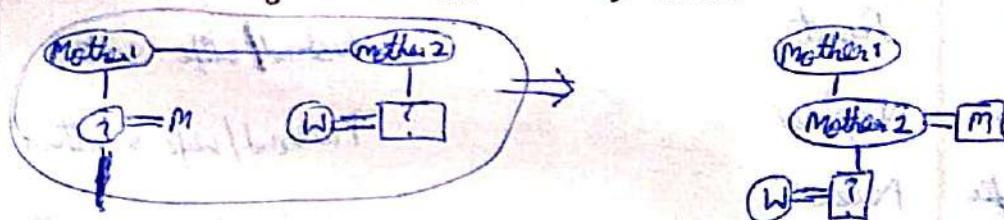
Q1) If A is the brother of B; B is the sister of C; and D is son of C, how is D related to A?

- a) Brother
- b) Sister
- c) Nephew
- d) None of these



Q2) Mother-in-law of a man and mother-in-law of a woman are mother and daughter respectively. Mother-in-law of the man has only one child. How is the man related to the women?

- a) Father-in-law
- b) Daughter-in-law
- c) Father
- d) Mother



Q3) A, B, C, D, E and F are family members, in which there are two married couples. D and F are siblings. C is son-in-law of A and has only one son F. B is only child of E, who is grandfather of D. How is B related to D?

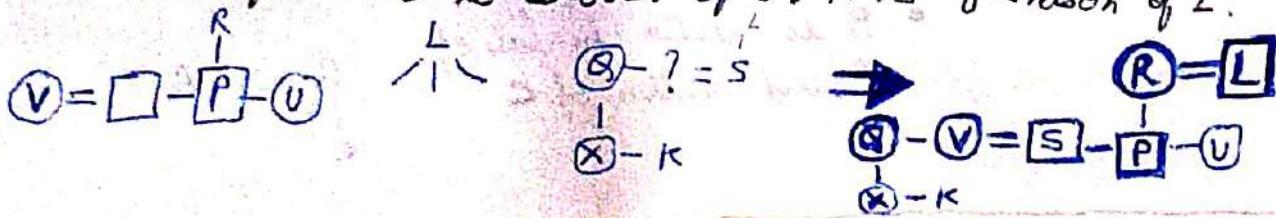
- a) Sister
- b) Aunt
- c) Mother
- d) Father

$$A = E$$

$$B = C$$

$$D = F$$

Q4) P is son of R. U is sister of P. L has 3 children out of whom 2 are married. X is Q's daughter. V is daughter-in-law of R, but not married to P. Q is sister-in-law of S and mother of K. L is S's father. S is brother of U. K is grandson of L.



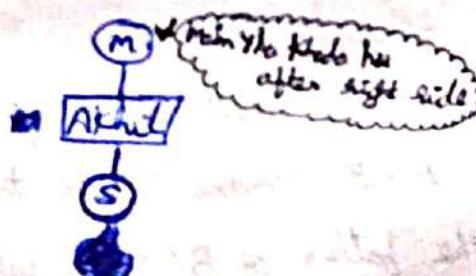
TIP → 'MY' word search karne aur woh right side ke bina ke wahan
 Khade hajse ab hi se left side ke bones.
 → 'MY' aur 'YOUR' dono dikhne ke dono ke aay-aay digjon bina
 ke merge kardo.

Q1) Pointing towards a Photograph of a boy, Akhil (who is male) says,
 "He is the ~~only~~ son of the only son of my mother". How is
 Akhil related to that boy?

- a) Brother b) Sister

Father

c) None of these



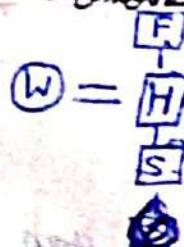
Q2) Pointing to a boy, a woman says that "He is son of the only son
 of my father in law's only son". How is the woman related to that boy?

- a) Grandfather

Grandmother

Mother

d) None of these



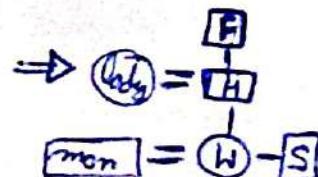
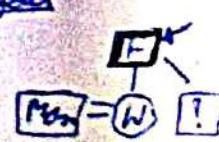
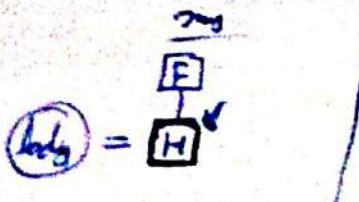
Q3) Pointing to a man, a lady said that, "The Father of your father in law's
 only son is my father in law's only son". How is the lady
 related to the man?

- a) Wife

Mother in law

Mother

d) Aunt



TIP → Q-2 me kya option ko choose karo? Kya $S+T$, opt. elimination keli gane khabri h!!

Q1) If ' $S-T$ ' means 'S is the wife of T' ; ' $S+T$ ' means 'S is daughter of T' and ' $S \div T$ ' means 'S is the son of T'. What will ' $M+J \div K$ ' mean?

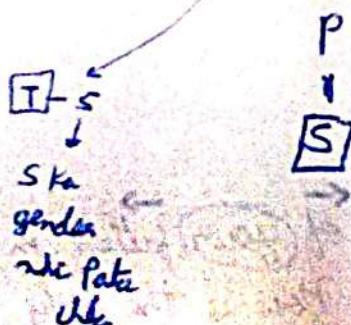
- a) J is wife of K b) K and M are brothers c) M is grandfather
d) K is father of M



Q2) If ' $A+B$ ' means 'A is the brother of B' ; ' $A-B$ ' means 'A is the sister of B' ; ' $A \times B$ ' means 'A is the wife of B' and ' $A \div B$ ' means 'A is the father of B' then which of the following indicates 'S is the son of P'?

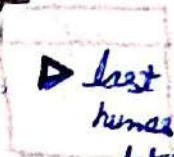
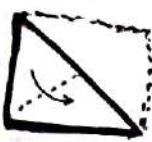
~~a) $P \times Q \div R \div S - T$~~ (✓)
~~b) $P \times Q \div R - T + S$~~

~~b) $P \times Q \div S - R + T$~~
d) ~~$P \times Q \div R - S \div T$~~ (✓)

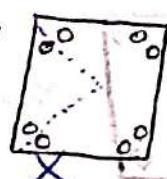
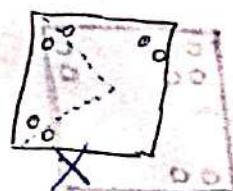
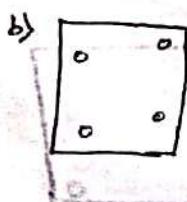
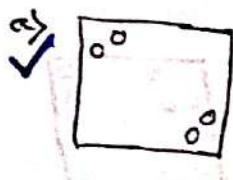


* $P, S \rightarrow 1 \text{ gen. gap}$
 $S \rightarrow \text{male}$

Paper cutting and Folding

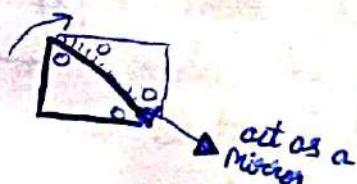
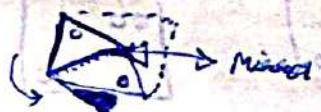


► last image ka hamesha table dekhe



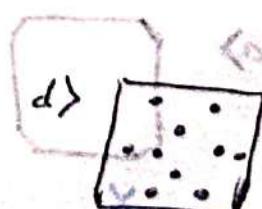
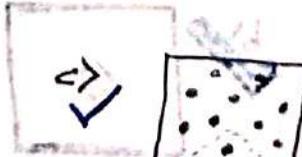
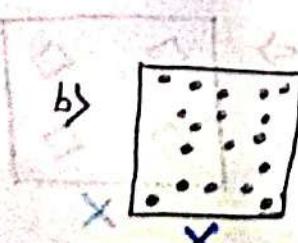
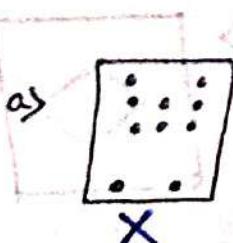
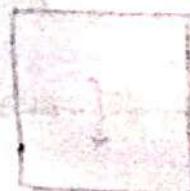
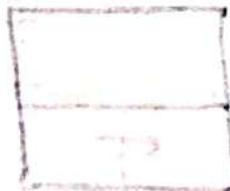
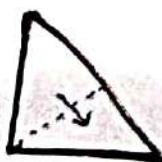
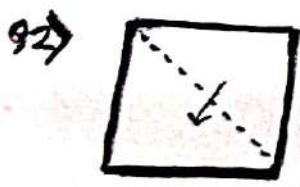
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(eliminate opt. c/d)

► ab last Image se first th jao aur million bns do
high me

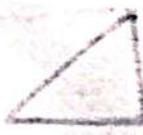
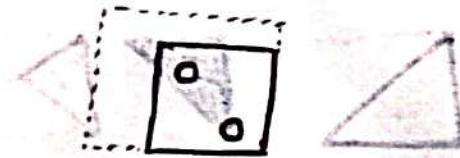
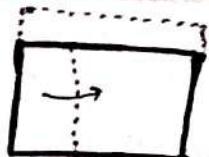
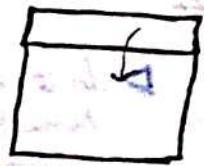


• opta

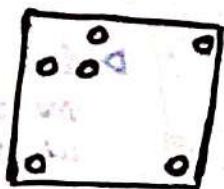
Just those 3 values



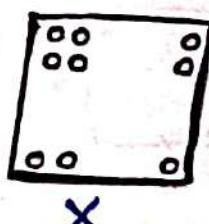
Q3)



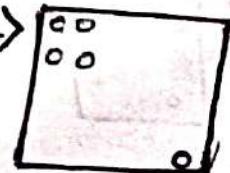
a)



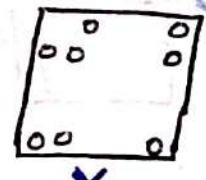
b)



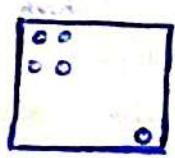
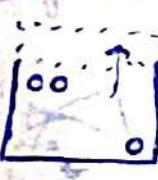
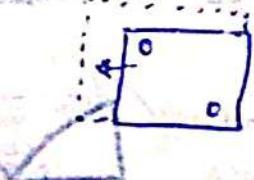
c)



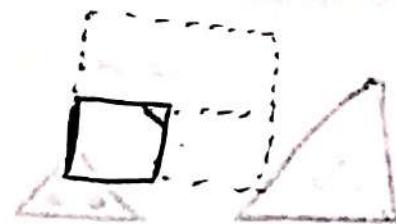
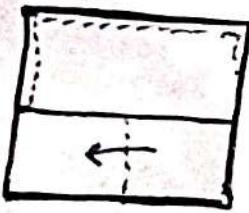
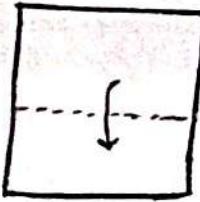
d)



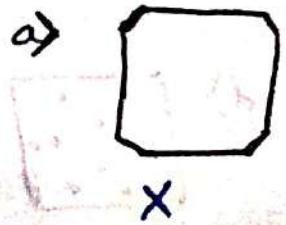
* Be careful to see
Page and se nahi
mora gya h



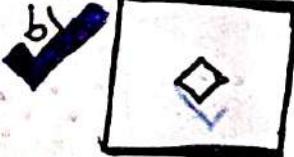
Q4)



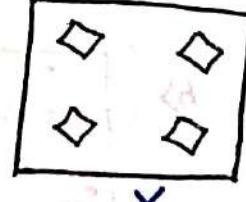
a)



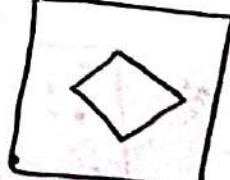
b)



c)



d)



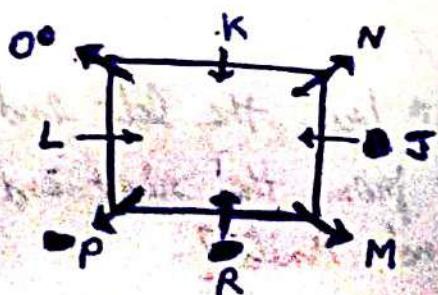
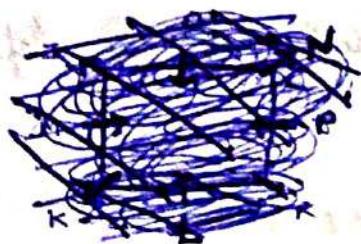
It's here
there he!!

Seating Arrangement

Q1) A, B, C, D, E, F and G are sitting in a row facing North. F is to the immediate right of E. E is 4th to the right of G. C is the neighbour of B and D. Person who is third to the left of D is at one of ends.

$$\text{G} - \text{--- E F} + \text{--- B C D} \rightarrow \text{G B C D E F A}$$

Q2) There are eight persons J, K, L, M, R, O, P and N are sitting around a rectangular table in such a way that four of them sit at four corners of the table while four sit in the middle of each of the four sides. The ones who sit at the four corners face outside the centre while those who sit in the middle of the sides face inside. K sits second to the right of J. P sits second to the left of O. L sits third to the left of N. L faces inside. R sits third to the left of O. L is not the immediate neighbour of J.

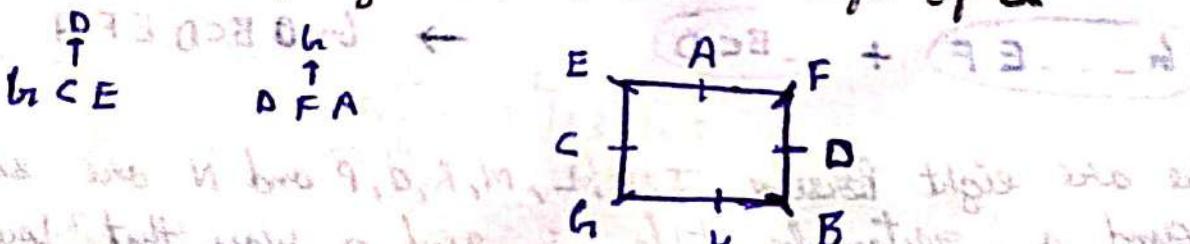


L — N

L — R — P — N — O

1 - 21 - 21

- Q) Four ladies A, B, C and D and four gentlemen E, F, G, H are sitting in a circle around a round table facing each other. No two ladies or two gentlemen are sitting side by side. C who is sitting b/w G and E is facing D. F is b/w D and A and facing b/. H is to the left of B.



TIP

- Total = L + R - 1, where L is the number of people facing left and R is the number of people facing right.
 - Person b/w $P_1, P_2 = P_1 - P_2 \pm 1$
- Q) In a queue, Ram is 26th from left and 12th from the right. How many persons are there in the queue?

$$26 + 12 - 1 = 37 \text{ Ans.}$$

- Q) In a row of 50 students, Rohan is 24th from the left side. Find his position from right side?

$$\begin{aligned} T &= L + R - 1 \\ 50 &= 24 + R - 1 \\ R &= 27 \end{aligned}$$

∴ 99

- Q) In a row of girls, Sunita is 20th from the left end and 12th from the right end. Anita is 15th from the right end in the row. How many girls are b/w Sunita and Anita?

$$\begin{aligned} 15 - 12 - 1 \\ = \underline{\underline{2}} \end{aligned}$$

TIP → always think of small range,

$$\begin{array}{c} \text{eg} \rightarrow 1 \ 2 \ 3 \\ \quad \quad \uparrow \quad \uparrow \\ \quad \quad 3 - 1 - 1 = \underline{\underline{0}} \end{array}$$

Number Series

Category [difference & double difference

Series [multiply
divide
addition
Subtraction
Zigzag [Ince / Decrease
Decr / Incr

- Sq → 1, 4, 9, 16, 25, ... → 2, 5, 10, 17, 26, ...
+1, +1, +1, +1, +1
- cube → 1, 8, 27, ...
- odd → 1, 3, 5, 7
- even → 2, 4, 6, 8
- prime → 2, 3, 5, 7
- fib → 1, 1, 2, 3, 5, 8 → 2, 2, 4, 6, 10
1, 1, 2, 3, 5, ...

Q1) $127, \frac{4}{131}, \frac{8}{139}, ? , \frac{4}{151}, \frac{8}{155}, \frac{4}{163}, \frac{8}{167}$
 a) 141 b) 143 c) 147 d) 149

Q2) $5, \frac{11}{16}, \frac{32}{49}, \frac{55}{104}, ?$
 a) 161 b) 171 c) 181 d) 191

Q3) $8, 7, \frac{11}{12}, \frac{14}{17}, \frac{17}{17}, \frac{22}{22}, ?$ ∵ (26)
 a) 20 b) 22 c) 24 d) 27

Q4) $2, \frac{6}{12}, \frac{20}{30}, \frac{30}{42}, \frac{56}{?}$ ∵ (72) Ans,
 +4 +6 +8 +10 +12 +14 +16

Q5) $7, 26, 63, 124, 215, 342, ?$
 $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow$
 $2^3-1 \quad 3^3-1 \quad 4^3-1 \quad 5^3-1 \quad 6^3-1 \quad 7^3-1 \quad 8^3-1 \Rightarrow (511) Ans$

Q6) $2, \frac{11}{46}, \frac{141}{?}, 291$
 $\times 5 + 1 \quad \times 4 \quad \times 3 \quad \times 2$
 $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$
 $2 \quad 3 \quad 6 \quad 15 \quad ?$ ∵ = 141 × 2 + 4 ⇒ (281) Ans

Q7) $2, \frac{3}{5}, \frac{6}{15}, \frac{15}{45}, \frac{45}{?}, \frac{156.5}{630}$

Q8) $5, \frac{9}{4}, \frac{25}{16}, \frac{59}{34}, \frac{125}{64}, 225, 369$
 $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$
 $2 \quad 4 \quad 6 \quad 8$

a) 540, 550, 575, 585, 615, 620, 645

b) 36, 20, 12, 8, 6, 5, 5, 4, 2

c) 5, 8, 16, 26, 50, 98, 194

d) 7, 10, 8, 11, 9, 12

s, a, b, c, d, e

what will be in place of d?

- a) 8 b) 6 c) 9

e) 4, 11, 30, 67, 128, 221, 346

5, 10, 15, 20, 25, 30

10, 20, 30, 40, 50

25, 35, 45, 55, 65

75, 85, 95, 105

125, 135, 145, 155, 165

185, 195, 205, 215, 225

245, 255, 265, 275, 285

305, 315, 325, 335, 345

Syllogism

→ Statement: ... ✓
Conclusion:

- Use Venn diagram

► Some A are not B

► No A are B

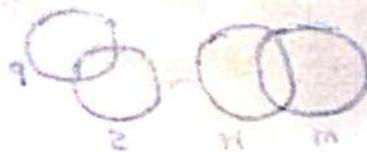
► Some A are B

► All A are B



- All A are B is Possible
- All A are not B is Possible
- Some B are A
- Some B are not A is Possible
- All B are A is Possible

- Some A are B
- Some B are A
- Some B are not A is Possible
- All B are A is Possible

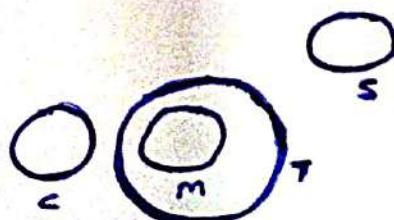


Q1) Statement: No cup is medal
All medals are trophies
No trophy is a shield

Conclusion: All trophies are medal

No shield is medal

Options → Both conclusion I and II are true
Neither conclusion I nor II is true
Either conclusion I or II is true
✓ Only conclusion II is true
Only conclusion I is true



a)

Statement : Some minutes are hours

No hours is a second

Some periods are second

Conclusion : ✓ Some periods are not hours

✓ Some minutes are not seconds

* Some seconds are not hours

option →

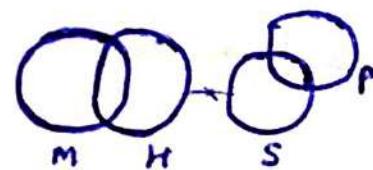
only I and II follows

only II and III follows

only II follows

only I and III follows

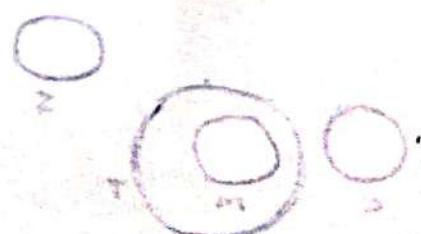
✓ All follows



support for : minutes

when a is greater than b
a is greater than c
b is greater than c

and so I have 2 circles here & both
are greater than the third circle
and this is because either
I & II are greater than
and II & I are greater than



Data Sufficiency

- options :-
- (A) If the data in statement 1 is alone sufficient to answer, while data in 2 alone are not sufficient to answer the question.
 - (B) If the data in statement 2 is alone sufficient to answer the question, while data in 1 alone are not sufficient to answer the question.
 - (C) Either data in statement 1 or 2 together are sufficient to answer the question.
 - (D) Either data in statement 1 or 2 together are not sufficient to answer the question.
 - (E) If the data in both the statements 1 and 2 are required to answer the question.

Q) How many coins does Archana has?

- 1 - Ravi has 10 coins which is 5 more than Neha.
Archana has 2 coins more than Saurav, who has
2 more than Neha.
- 9 ∵ Bpt.A
- 2 - Saurav has more chocolates than Neha but less
than Ravi, who has 10 coins

Answers to

1. John Parker is a timber sales manager at a saw mill. ① ~~factory~~
2. John will receive a raise for the work he has
done up until now in his job. ②
3. John's pay raises are based on the quality of
timber he cuts and is not limited to the time
~~he spends on~~

possible for him to get a raise if he does well. ③
4. John will receive a raise if he does well.
~~he spends more time~~

Final sentence was said from well ④

John will receive a raise if he does well - 1
and the manager will give him a raise if he does well

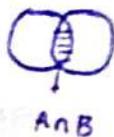
(1.5) p. John will receive a

raise if he does well - 2
and the manager will give him a raise if he does well

0

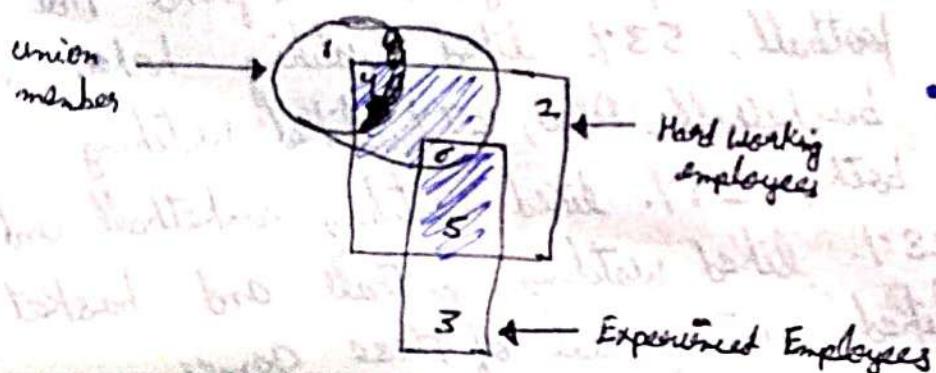
Venn Diagram

$$A \cup B = A + B - A \cap B$$



Q) Number of hard working employees, who are neither experienced, nor union members?

a) 1 b) 4 c) 6 d) 2



$$\therefore 2 \text{ Ans}$$

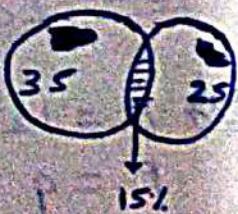
Q) In a town, 50% person like pizza, and 15% like both. Find the percentage of people who like either pizza or burger?

a) 40

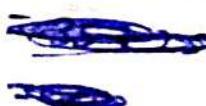
~~80~~

~~75~~

d) 45



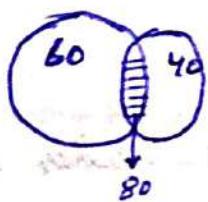
$$\therefore (35 + 25) - 15$$



$$35 + 25 - 15$$

$$= \underline{\underline{75}}$$

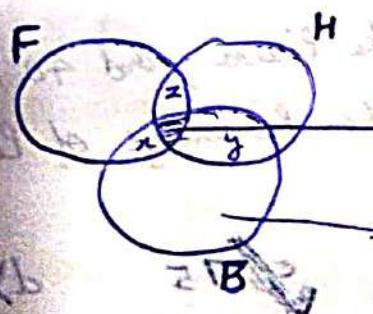
Q) In a college, 200 students are randomly selected. 140 like tea, 120 like coffee and 80 like both tea and coffee. How many like only tea?



$$\therefore \underline{60} \text{ Ans}$$

Q) In a survey of 500 students of a college, it was found that 49% liked watching football, 53% liked watching hockey and 62% liked watching basketball. Also, 27% liked watching football and hockey both, 29% liked watching basketball and hockey both and 28% liked watching football and basketball both. 15% liked watching all of these games.

TIP → ulta se Q-Palne,



$$x + 15 = 28 \\ \therefore x = 13$$

$$y + 15 = 29 \\ \therefore y = 14$$

$$z + 15 = 27 \\ \therefore z = 12$$

$$15 + 13 + 14 + B = 62 \\ \therefore \boxed{B = 20}$$

Similarly $H = 12$

$$F = 9$$

► How many students like watching all three games?

$$\therefore \frac{15}{100} \times 500 = \boxed{75} \text{ Ans}$$

①

Statement and Assumption

always
100% true

1st thing that
comes to your mind

Tip → • advertisement are right in form of art.

• Personal thoughts are right in form of art.

• ~~Government rule~~ always correct ✓

► common sense

• 'Not' make false statement ~~sold hardware!!~~

Q1) **Statement**: A very large no. of aspiring students applied for admission to the professional courses run by the renowned college in two.

Assumption : (i) ✗ - All the students may be able to get admission to the college

✓(ii) - The admission process adopted by the renowned college may be fair to all the applicants

Statement

Q2) The state administration banned gathering of more than fifty people to any place during the visit of foreign dignitaries to the city.

Assumption : (i) ✓ - People may avoid gathering at any place in the city during the period of visit of foreign dignitaries.

(ii) ✗ - Many people may ignore the prohibitory orders and gather to get a glimpse of the dignitaries.

Standard bone tracks

No history of bone or joint disease -

No history of bone or joint disease -

▼ Bone spurs elsewhere -

▼ No history of bone or joint disease -

Abnormal

Difficult to find bone or joint disease -

V

No history of bone or joint disease -

X

No history of bone or joint disease -

No history of bone or joint disease -

Coding and Decoding

Preciate →

Success

by zero → no E age

Q1) In a certain code, ROOMMATE is coded as NPPSFUBN. How is SCRABBLE written in the code?

a) TOSBCCFM

b) FMCCBSDT

✓ BSDTFMcc

d) BSDZAM

► TIP 0: If direct, write directly

► TIP 1: Write all in ~~one~~ numeric

18 15 15 13 13 120 5
14 16 16 19 6 21 2 14

► TIP 2: Try +1/-1 ong pattern in:-

a) Some - Some ↑↑

b) First - last (cross) ✗ ✗

c) divide in 2 bit ↑ cross

d) divide in 4 bit x cross

∴ SCRABBLE

B S D T

E R A S I R

P a s e d

Z M E L I

Q2) If DURATION is coded as VEBSJUOP then what is the code for FORECAST?

a) P h S F B D T U

b) P h F S U T B V

✓ P h F S B D U T

d) P h S F u

DURATION →	4	21	18	1	20	9	15	14
VEBSJUOP →	2	5	2	19	18	21	5	16

∴ F O R E C A S T
P h F S B D T U

- ① ② Word Pattern
- TIP ● Things to keep in Mind
- A) ~~EDOTY~~ → ~~TYOTE~~
- B) Q1) Arrange the following words in a meaning sequence -
 1 - Key , 2 - Door , 3 - Lock , 4 - Room , 5 - Switch on
 a) 1, 2, 3, 4, 5 b) 1, 3, 2, 4, 5 c) 3, 4, 2, 1, 5 d) 5, 4, 1, 3, 2
 e) 1, 2, 3, 4, 5
- C) Q2) Arrange the following words in a meaning sequence -
 1 - Income , 2 - Status , 3 - Education , 4 - Well being
 a) 1, 2, 3, 4, 5 b) 1, 3, 2, 5, 4 c) 4, 1, 2, 5, 3 d) 3, 5, 1, 2, 4
- D) Q3) If the following words are arranged in a dictionary, what will be the sequence?
 1 - Dream 2 - Drought 3 - Discourage 4 - Delight
 a) 4, 3, 1, 2 b) 1, 2, 3, 4 c) 4, 3, 2, 1 d) 1, 4, 2, 3

① Statement and Conclusion

► Venn Diagram
► Syllogism

TIP → Venn Diagram broke solve problem (solved at first time)

tab is for
ke questions
early knowledge.

- A) if only conclusion I follows
- B) if only conclusion II follows
- C) if either I or II follows
- D) if neither I nor II follows
- E) If both I and II follows

Q1) Statement → Some men are educated
Educated Person prefers small families
Conclusion → 1 - All small families are educated
2 - Some men prefer small families



(opt-B)

~~Some men are educated & educated person prefers small families~~

~~$S = S1 + S2 + S3$ $S = S1 + S2 + S3$ $S = S1 - S2 + S3$~~

~~$S = S1 + S2 + S3$ $S = S1 - S2 + S3$~~

~~$S = S1 + S2 + S3$ $S = S1 - S2 + S3$~~

~~$S = S1 + S2 + S3$ $S = S1 - S2 + S3$~~

~~$S = S1 + S2 + S3$ $S = S1 - S2 + S3$~~

~~$S = S1 + S2 + S3$ $S = S1 - S2 + S3$~~

①

~~of due date~~

Mathematical operations Arrangement

• **BOOMAS**
bracket

(use this to solve these Qs)

Q1) Select the correct set of symbols which fit in the given equation $5 \text{ } 0 \text{ } 3 \text{ } 5 = 20$

a) \times, \times, \times

↓

$$(5 \times 0 \times 3 \times 5) \\ = 0$$

b) $+, -, \times$

↓

$$\begin{array}{r} 5+0-3\times 5 \\ \hline 5-15 \\ -10 \end{array}$$

c) $+, +, \times$

↓

$$5+0+3\times 5$$

$$5+15$$

$$= 20$$

d) $-, +, \times$

↓

$$5-0+3\times 5$$

$$5+15$$

$$= 20$$

Q2) Interchange signs + and - , numbers 4 and 8

a) $4+8-12=0$

↓

$$8-4+12 \\ 16$$

b) $4-8+12=0$

↓

$$8+4-12 \\ 0$$

c) $8+4-12=24$

d) $8-4+12=8$

Q3) If \div means +, \times means \div , $+$ means - and $-$ means \times , then what is the value of the expression $16-4+12\times 3\div 5$

a) 59

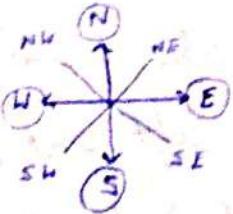
b) 53

c) 65

d) 67

$$\begin{array}{r} 16 \times 4 - 12 \div 3 + 5 \\ \hline 64 - 4 + 5 \\ = 65 \end{array}$$

► TIPS: $a+b\div c = 5$
 ✓ only possible if
 the gives right value
 Not claimed



Directions

(clockwise → right)

-
- distance
- angle
- condition
- shadow

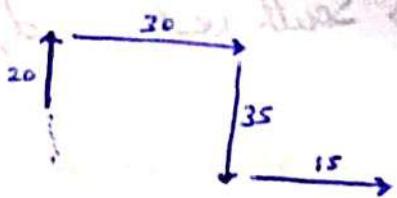


- 9) Ankita walked 20 m towards the north. Then she turned right and walks 30 m. Then she turns right and walks 35 m. Finally, she turns left and walks 15 m. In which direction is she from the starting position?

b) 15 m, East

c) 30 m, North

d) 30 m, East



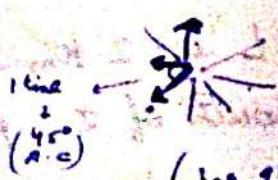
- 8) A is facing west direction. He turns 90° in clockwise direction then he turns 90° in anticlockwise direction and further 45° in the same direction. If he repeats the task for 60 times, finally he will be in which direction?

a) North

b) West

c) North-East

d) South-East



8 times (Same Point +1)

($\frac{360^\circ}{45^\circ}$ = 8 times)

(8 to 61 so back)

b) 61 (007)



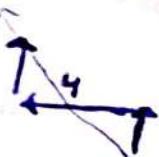
- C) Q) Mrs. Veni wants to go to the Krishna Rajendra market. She moved northwards and after covering some distance turned left and moved 4 km and reached a crossing. The road in front of her led to Jaynagar while the road on to her right led to Bangalore Medical College and the road on to her left to the Krishna Rajendra Market. In which direction is the Krishna Rajendra Market located with reference to the starting point?

a) West

b) North-West

c) South-west

d) East



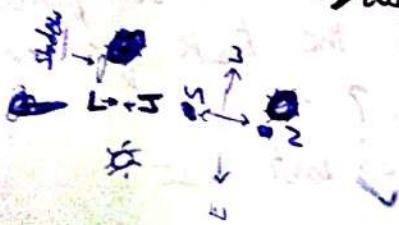
- Q) Q) One morning after sunrise Juhu while going to school met Lalli at Boring road crossing. Lalli's shadow was exactly to the right of Juhu. If they were face to face, which direction was Juhu facing?

a) North

b) East

c) West

d) South



- Q) Q) J, K, L, M, N, O, P and R are eight huts. L is 2 km east of K. J is 1 km north of K and Q is 2 km south of J. P is 1 km west of Q while M is 3 km east of P and O is 2 km north of P. R is situated right in the middle of K and L while N is just in the middle of Q and M. Difference b/w K and P is

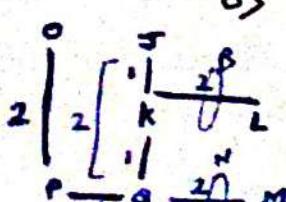
a) 1 km

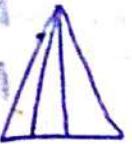
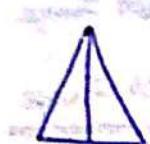
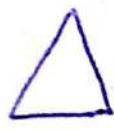
b) 2 km

c) 1.41 km

$\sqrt{5}$

d) None of these





Kite shape = hexagon

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

$\rightarrow ①$

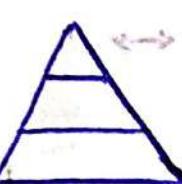
$\rightarrow ③$

$\rightarrow ⑥$

$$\frac{2 \times 3}{2}$$

$$\frac{3 \times 4}{2}$$

$$\frac{4 \times 5}{2}$$



$\rightarrow 6$
Count no. of horizontal lines $\rightarrow n(n+1)/2$

$\rightarrow ①$

$\rightarrow ②$

$\rightarrow ③$

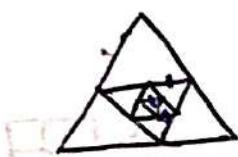
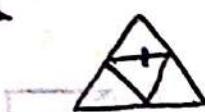
$\rightarrow ④$



vertical
 \downarrow
 $\left(\frac{3 \times 4}{2}\right) \times 2$
 $= 12$ Ans

ANS 4 3 Q 12
 3 N A 3 A Q 21

2 1 2 1 3 2 3 4 5 6
 1 2 3 4 3 A N S



$$4 + 1$$

$\rightarrow ⑤$

$$4 + 4 + 1$$

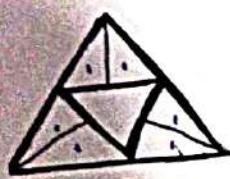
$\rightarrow ⑨$

$$4 + 4 + 4 + 1$$

$\rightarrow ⑬$

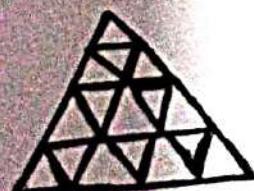
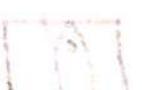


$\rightarrow ⑭$



$$4 + 1 + 6$$

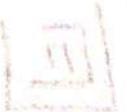
$\rightarrow ⑪$ Ans



$$\begin{array}{l}
 1 \nearrow 1 \\
 2 \nearrow 3 \\
 3 \nearrow 6 \\
 4 \nearrow 10
 \end{array}$$

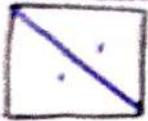
$$\frac{20 + 7}{2}$$

$\rightarrow 27$ Ans



Ans 10

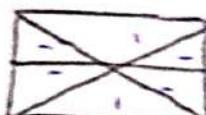
no. of 4x4 sub-squares in magic 2 fig :-



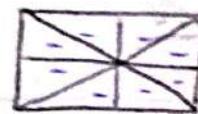
②



4x2

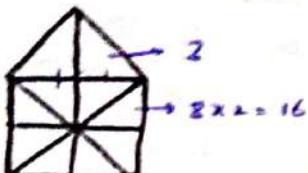


4x2



8x2

3)



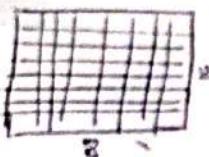
$$\therefore \text{No. of } 2 \times 2 = 16$$

$$\begin{array}{r} 19 \\ + 2 \\ \hline 21 \end{array}$$

check opt. / derivative trick

VI 19 squares each with
Side option to
select best one

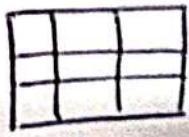
► no. of Squares :-



→ 204 squares

$$1^2 + 2^2 + \dots + 7^2 + 8^2 = \boxed{\frac{n(n+1)(2n+1)}{6}}$$

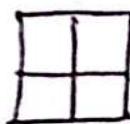
(symmetric)



$$\rightarrow 1^2 + 2^2 + 3^2$$

$$= 1 + 4 + 9$$

$$= 14$$



$$\rightarrow 1^2 + 2^2$$

$$= 5$$

(asymmetric)

(row wise diff)

1	2	3	4
2			
3			

$$\rightarrow 4 \times 3 = 12$$

$$3 \times 2 = 6$$

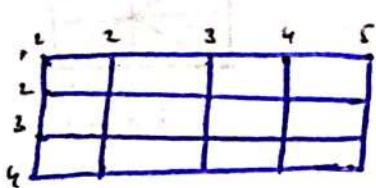
$$2 \times 1 = 2$$

Jab tak 1

$$\overline{(20) Ans.}$$

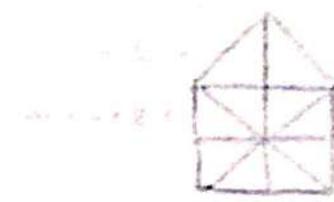
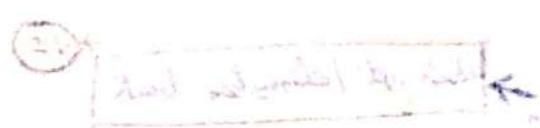
no type da alle.

Δ No. of Rectangles



$$\rightarrow 4c_2 \times 5c_2 = A_2$$

Now draw a 3x3 grid
of rectangles and
obtaining



- Example 3 :-

Example 3 :-

$$(n^2)_{\text{rect}} = 1^2 + 2^2 + \dots + n^2 = 1 + 4 + 9 + \dots + n^2$$

$$② = 1^2 + 2^2 + \dots + n^2$$



$$1^2 + 2^2 + 3^2 + \dots + n^2$$



$$\begin{aligned} 1^2 &= 1 \times 1 \\ 2^2 &= 2 \times 2 \\ 3^2 &= 3 \times 3 \end{aligned}$$



$$\begin{aligned} 1^2 + 2^2 + 3^2 &= 1 + 4 + 9 \\ &= 14 \end{aligned}$$

Statement :-

Letter	R	C	D	A	P	F	U	M	E	N	I	V	S	O	T
Symbol	#	2	7	n	%	3	\$	9	1	@	s	k	6	8	\$

- Q) If first letter is vowel and last letter is consonant then both are coded with the code of the consonant.
- * If both the second and last letter is vowel, then their code are to be interchanged.
- * If the second letter is a consonant and the second last letter is vowel, both are to be coded as the code for the vowel.
- * If both first and fifth letter is consonant then both are coded as the code of third letter.
- ✓ If only one condition is applied then the code of first letter is interchanged with code of second letter and third letter to the code of fourth letter and so on.

What is the code for DECANT

→ 7 1 2 n @ \$ (Now check for cond'n)

2 1 2 n 2 \$

1 2 n 2 \$ 2

Ans.

→ Binary to Decimal → $\frac{1}{16} + \frac{0}{8} + \frac{0}{4} + \frac{1}{2} + 1 = 19$ Ans.

→ Decimal to Binary → 19 = 10011

1 0 0 0 1 1

Ans. ← tail ← tail

Q1) In a certain number system, there are only two notations A and B. A for 0 and B for 1. Numbers are represented such as 2-BA, 3-BB and so on what is the sum of HABBA and ABABAB?

A=0
B=1

∴ BAAAB

HABBA

ABABAB

$$12 + 21 = 33$$

Q) What is resultant if BRAAAA is divided by BAAA?

(32)

÷ (8)

= 4

4 2 1
BAA

(32)

16 8 4 2 1 → 200... 20

Q1) "Work get value salary" is coded as "Spt bsy srt qsr"
"Monthly salary get in rupees" is coded as "srt typ qsr pkl
mng"

"Fifty in rupees value work" is coded as "PKL bsy spt typ luv"

"Work more get monthly" is coded as "bsy srt mng zlm"

which of the following is the code for rupee?

- a) typ b) PKL c) Luv d) Either a or b

► Tip 0: order kuch v ho saktah

► Tip 1: Work Jo 1st line reh rukha code Spt nahi h, wo use se
kuch v ho saktah, ab dhunde work kha-kha h aur
use kya kya common h.

See Work → 1st line / 3rd line / 4th me common h, ab ye
tumhe bhy common h

∴ work → bsy

Similarly, find all

get → srt

value → spt

salary → qsr

monthly → mng

Q2) Which of the following can be the code of "but monthly
Salary"?

- a) typ PKL luv b) Luv mng spt c) PKL luv spt

~~mng srt qsr~~ (order matter nahi karta)

verb form (unmarked)

VERBAL ABILITY

Simple forms

Continuous Tense

From helping verb with
↑ effect past
tense

Perfect Tense

Past in action,
structure
past tense -
↑

Perfect Past.

► Present

V, + s/es

am/is/are + V₁+ing

have/has + V₃

have/has been
+ V₁+ing

► Past

V₂ + ed

was/were + V₁+ing

had + V₃

had been
+ V₁+ing

► Future

will/shall + V₁

will be + V₁
+ ing

will have
+ V₃

will have
been
+ V₁+ing

• I → -

He/She → s

• He/She → is

They → are

• I → have

He/She → has

We/They → have

← 'Singulat'

goes → Singular
go → Plural

For any correct "is", only
see these concepts

► For Antonym & Synonym → check if opt related & then **Turka**

► For Statement-Assumption

↳ assumption ko ulte karo, Phir check karo agar statement hi ulte ho to
↳ assumption starts with 'ALL' → is wrong (closure)

✓ correct

► For Statement Conclusion

↳ use Venn-Diagram

The evening (so, date ki 2 se 3-18 h o'clock)

► Reading Comprehension → Jisko Pahli hi Seeti & Roll Se, Phir seeti Hooge!!

nit

20

2

(mostly Singular)

VERB

verb

Subject-Verb Agreement

3)

- Subjects joined by 'or' or 'nor' take verb that agrees with the first subject.
- Two singular objects connected by 'and' require a **Plural verb**.
- Words like either, neither, each, everyone, many, most → **Singular**
- Physics → looks plural but → **SINGULAR**
- Couple → looks singular but → **PLURAL**

either → Both
neither → Neither

• My Brothers, unlike my son (is) very smart

Brother
like
more than
nothing
rather than
together with
as well as
along

(depends on 1st Subject)

• The coach and the captain of the team have been sacked

not plural - verb

standard sentence

standard sentence

1) verb below will be used plural if verb is not → verb

②

TIME AND WORK

Q) If A can complete a work in 10 days and B can complete the same work in 15 days then in how many days will they both together complete the work?

$$\text{LCM} \rightarrow 10, 15 \rightarrow 30 \text{ unit of work}$$

$$A = \frac{30}{10} = 3 \text{ unit/day}$$

$$B = \frac{30}{15} = 2 \text{ unit/day}$$

$$A+B = 5 \text{ unit/day}$$

$$\therefore \frac{30 \text{ unit}}{5 \text{ unit/day}} = 6 \text{ days.}$$

Q) If A can do a work in 10 days and B can do a work in 15 days then both work together for 4 days then A left in how many days, will B do the remaining work?

$$\text{LCM} \rightarrow 30 \text{ unit (Total work)}$$

$$A = \frac{30}{10} = 3$$

$$B = \frac{30}{15} = 2$$

$$\Rightarrow 5 \text{ unit/day}$$

$$\therefore 5 \times 4 \\ = 20 \text{ unit}$$

$$\therefore 30 - 20 \\ = 10$$

Q) A can do a work in 16 days. B can do the same work in 12 days. With the help of C they complete the job in 4 days. How much does it takes for C alone to complete the work?

$$A: 16$$

$$B: 12 \rightarrow \text{LCM} = 48 \rightarrow 48 \text{ unit of work}$$

$$A = \frac{48}{16} = 3$$

$$B = \frac{48}{12} = 4$$

$$\Rightarrow 7 \text{ unit/work}$$

$$\therefore \text{After 4 days} \\ 7 \times 4 = 28 \text{ unit} \\ \therefore 48 - 28 = 20$$

TIME AND MONEY

20 unit in 4 day

$$\frac{48}{5} = 9 \frac{3}{5} \text{ Ans.}$$

Q) A and B can do a piece of work in 12 days, B and C in 15 days, C and A in 20 days. Find A alone can do the work?

$$A+B \xrightarrow{+} B+C \xrightarrow{-} A+C$$

\downarrow

$\frac{1500}{(B)} = 20$

$(A) =$

$$\rightarrow \Delta \zeta^m \rightarrow \delta \theta = \frac{\partial \theta}{\partial t} \approx 5^\circ$$

Let $(A) \cong \overline{(B)} \subset (C)$

$$A = \frac{60}{T^2} = 5 \text{ unit/day}$$

$$A+B+C = 10 \text{ unit/day}$$

$$B = \frac{60}{15} = 4 \text{ unit/day}$$

$$A+B+C+A+C = 12$$

$$C = \frac{60}{20} = 3 \text{ inst/class}$$

$$2(A+B+C) = \frac{10E}{01} = A$$

$$\begin{array}{rcl} A + B + C & = & 6 \text{ units/day} \\ S & = & \frac{A + B + C}{3} \\ A + 4 & = & 6 \end{array}$$

$$A = 2 A_{\text{reg}}$$

$$\therefore \frac{60}{2} = 30 \text{ days}$$

$$(g \cdot v^2) \geq \frac{v}{2}$$

四百九十二

to work here well. Zygoballus has not yet dispersed from
cave mouth at Delgada at end of May until

Q) 4 men and 6 women can complete a work in 8 days. while 3 men and 7 women can complete it in 10 days. In how many days will 10 women complete it.

$$1 \text{ man work in 1 day} = x$$

$$1 \text{ women work in 1 day} = y$$

$$4x + 6y = \frac{1}{8} \quad \text{---(1)}$$

$$3x + 7y = \frac{1}{10} \quad \text{---(2)}$$

$$\hookrightarrow x =$$

$$y = \frac{1}{400}$$

$$\therefore 10 \text{ women} \rightarrow 10 \times \frac{1}{400} = \frac{1}{40} \rightarrow 40 \text{ days.}$$

Q) If 6 men and 8 women can do a piece of work in 10 days while 26 men and 48 women can do the same in 2 days the time taken by 15 men and 20 women in doing the same type of work will be?

$$1 \text{ man work in 1 day} = x$$

$$1 \text{ woman work in 1 day} = y$$

$$6x + 8y = \frac{1}{10} \quad \text{---(1)}$$

$$26x + 48y = \frac{1}{2} \quad \text{---(2)}$$

$$x = \frac{1}{100}$$

$$y = \frac{1}{200}$$

$$\therefore 15x + 20y$$

$$\Rightarrow \frac{15}{100} + \frac{20}{200} = \frac{1}{4} \rightarrow 4 \text{ days}$$

Q) If 15 men, working 9 hours a day, can reap a field in 16 days. In how many days will 18 men reap the field, working 8 hours a day?

$$15 \times 9 \times 16 = 18 \times 8 \times x$$

$$\therefore x = 15 \text{ days} \quad 8V = 9A + 5H$$

Q) A alone can do a piece of work in 6 days and B alone in 8 days. A and B undertook to do it for Rs 3200, with the help of C, they completed the work in 3 days. How much is to be paid to C?

A B C

$$6 \text{ days} \quad 8 \text{ days} \quad x$$

$$24 \text{ (LCA)}$$

$$A = \frac{24}{6} = 4$$

$$\rightarrow A+B=7 \text{ unit}$$

$$B = \frac{24}{8} = 3$$

\therefore After 3 days,

$$\therefore (7 \times 3) = 21$$

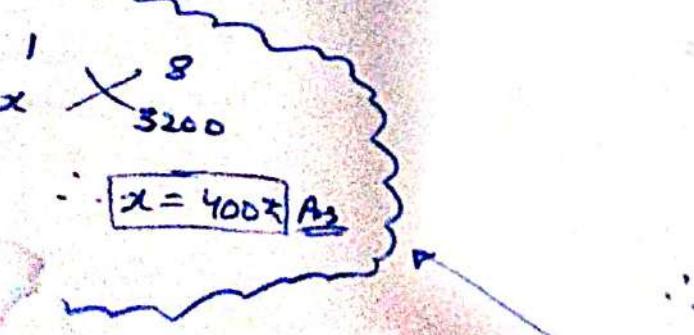
$$\therefore 24 - 21$$

$$= 3$$

\therefore 3 unit of work by C in 3 days

\therefore In one day $\rightarrow 1$ unit

$$\therefore C = 24 \text{ days}$$



$$\text{Efficiency} = \frac{1}{6} : \frac{1}{8} : \frac{1}{24}$$

$$\Rightarrow \frac{1}{6} \times 24 : \frac{1}{8} \times 24 : \frac{1}{24} \times 24 \Rightarrow 4 : 3 : 1$$

Pipes and Cisterns

Q) Pipes A and Pipes B can fill the tank in 5 and 6 hours respectively. Pipe C can empty the tank in 12 hours. If all the three pipes are open together then the tank will be filled in?

$$\begin{aligned} A &= 5 \\ B &= 6 \\ C &= 12 \end{aligned}$$

$\left\{ \text{LCM} = 60 \right.$

$$\begin{array}{c} \text{A} \quad \text{B} \\ \uparrow \quad \downarrow \\ \text{All 3P} = \frac{60}{21} = 8 \end{array}$$

$$1 \text{ hr} \rightarrow A = \frac{60}{5} = 12 \text{ L/hr}$$

$$\text{Rate} = \frac{60}{60} = 1 \text{ L/hr}$$

$$B = \frac{60}{6} = 10 \text{ L/hr}$$

$$\therefore 12 + 10 - 5 = 17 \text{ L/hr}$$

$$C = \frac{60}{12} = 5 \text{ L/hr}$$

$$\therefore \frac{60}{17} \text{ Ans.}$$

Q) Two pipes A and B can fill a tank in 15 min and 20 min respectively, both the pipes are opened together but after 4 mins. Pipe A is turned off. What is the total time required to fill the blank.

$$\begin{aligned} A &= 15 \\ B &= 20 \end{aligned}$$

$\left\{ \text{LCM} = 60 \right.$

$$A+B \rightarrow 7 \text{ L/min}$$

$$\therefore A = \frac{60}{15} = 4 \text{ L/min}$$

\therefore After 4 min,

$$B = \frac{60}{20} = 3 \text{ L/min}$$

$$7 \times 4 = 28 \text{ L}$$

$$\therefore \frac{32}{3} = 10 \text{ m } 40 \text{ sec.}$$

$$\begin{aligned} &\therefore 60 - 28 = 32 \text{ L left} \\ &\therefore 10 \text{ m } 40 \text{ sec} + 4 \text{ min} \\ &= 14 \text{ m } 40 \text{ sec.} \end{aligned}$$

Q) Three pipes A, B and C can fill a tank in 12, 15 and 20 hr respectively, if A is open all the time and B and C are open for 1 hour each alternately, the tank will be full in?

$$\begin{array}{l} A = 12 \\ B = 15 \\ C = 20 \end{array} \rightarrow \text{LCM} = 60$$

$$A = \frac{60}{12} = 5 \text{ L/hr}$$

$$B = \frac{60}{15} = 4 \text{ L/hr}$$

$$C = \frac{60}{20} = 3 \text{ L/hr}$$

$$2 + 1 + 1 = 4$$

$$4 \times 1 = 4$$

$$\begin{array}{l} 2 = A \\ 3 = B \\ 4 = C \end{array}$$

$$\therefore 1 \text{ hr} \rightarrow 5 + 4 = 9 \text{ L}$$

$$1 \text{ hr} \rightarrow 5 + 3 = 8 \text{ L}$$

$$2 \text{ hr} \rightarrow 17 \text{ L}$$

$$3 \text{ hr} = \frac{60}{5} = 12 \text{ L} \rightarrow 17, 34, 51, \dots$$

$$4 \text{ hr} = \frac{60}{4} = 15 \text{ L} \rightarrow 2, 2+2+2+1 = 7 \text{ L}$$

Q) Two Tap A and B can fill a tank in 10 hr and 8 hr respectively if both the Tap are opened simultaneously then how many hours before tap B should be closed so that tank fill in 5 hr?

$$\begin{array}{l} A = 10 \\ B = 8 \end{array} \rightarrow 40$$

How (standard way to solve),

$$\frac{20}{5} = 4 \text{ L/A}$$

$$\therefore A = 4 \text{ L/hr} \times 5 = 20 \text{ L}$$

$$B = 5 \text{ L/hr} \times 5 = 25 \text{ L} \rightarrow \therefore 5 \times 4 = 20 \text{ L}$$

$$\therefore \text{close B at } 4 \text{ hr}$$

(4 hr) Ans

Q) Three pipes A, B and C can fill a tank from empty to full in 30 min, 20 min and 10 min respectively; when the tank is empty all three pipes are opened. A, B and C discharge chemical solution P, Q and R respectively. What is the proportion of the solution R in the liquid in the tank after 3 mins?

$$\begin{aligned} A &= 30 \\ B &= 20 \\ C &= 10 \end{aligned} \rightarrow 60 \text{ L capacity}$$

$$\begin{aligned} x_1 &= A \\ x_2 &= B \\ x_3 &= C \end{aligned}$$

$$x_1 = \frac{60}{30} = 2 \text{ L/min}$$

$$x_2 = \frac{60}{20} = 3 \text{ L/min}$$

$$x_3 = \frac{60}{10} = 6 \text{ L/min}$$

$$\rightarrow A+B+C = 11 \text{ L/min}$$

$$\frac{60}{33} = \frac{20}{11}$$

$$C \text{ in } 3 \text{ min} \rightarrow 18 \text{ L}$$

$$\frac{60}{18} = \frac{10}{3} \rightarrow \textcircled{C}$$

$$A+B+C = 11 \text{ L/min}$$

$$\frac{C}{A+B+C} = \frac{10/3}{20/11} = \frac{6}{11} \text{ Ans.}$$

Q) A pump can fill the tank with water in 2 hours. Because of a leak, it took $2\frac{1}{3}$ hours to fill the tank. The leak can drain all the water of the tank in?

$$A = 2 \text{ hrs}$$

$$A+B = 2\frac{1}{3} \rightarrow \frac{7}{3}$$

$\left. \right\} \rightarrow \text{LCM} \rightarrow \textcircled{14}$ up to LCM
into HCF

$$A = \frac{14}{2} = 7 \text{ L}$$

$$A+B = \frac{14}{7/3} = 6 \text{ L}$$

$$\therefore B = 11 - 7 = 4 \text{ L}$$

14 L
ans

Q) Two pipes can fill a tank in 20 and 24 min respectively and a waste pipe can empty 3 gallons per minute. All the three pipe working together can fill the tank in 15 minutes. The capacity of tank is?

$$\left. \begin{array}{l} A = 20 \\ B = 24 \\ C = x \end{array} \right\} \rightarrow 120 \times (\text{Capacity assumption})$$

$$\left. \begin{array}{l} A = 6x \\ B = 5x \\ C = 120 \end{array} \right|$$

$$\therefore A + B + C \text{ in } 1L$$

$$6x + 5x + 120$$

$$\therefore 11x + 120$$

$$\therefore (x = -40)$$

$$\text{and } S = \frac{120x}{11x+120} = 15$$

$$\therefore 40x^3 = 120 \text{ gallon}$$

Q) Two pipe A and B together can fill a cistern in 4 hr had they been opened separately then B would have taken 6 hr more than A to fill the cistern. How much time will be taken by A to fill the cistern separately?

$$\left. \begin{array}{l} A = x \\ B = (x+6) \end{array} \right\} \rightarrow LCM = x(x+6) = \frac{36}{81}$$

$$\therefore A = \frac{x(x+6)}{x} = x+6 \quad A+B = 2x+6$$

$$B = x$$

$$\frac{x(x+6)}{2x+6} = 4$$

$$\therefore (x = 6 \text{ hr})$$

①

Train Problem

▷ Speed = $\frac{\text{Distance}}{\text{Time}}$

▷ Relative Speed

| ▷ $\boxed{\text{Distance change add}}$

$$u \rightarrow \leftarrow v$$

$$\boxed{\text{Speed} = u + v}$$

Q) A train running at the speed of 60 kmph crosses a pole in 9 seconds. What is the length of the train?

$$D = S \times t$$

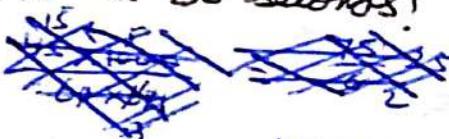
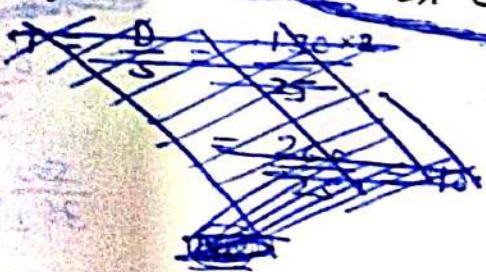
$$= \frac{60 \times 1000}{60 \times 60} \times 9 = 150 \text{ m. Ans.}$$

Q) A train 360 m long is running at a speed of 45 kmph. In what time will it pass a bridge of 140 m long?

$$D = 360 + 140 = 500 \text{ m.} = 0.5 \text{ km.}$$

$$\therefore T = \frac{D}{S} = \frac{0.5}{45} = \frac{1}{90} \text{ hr.} \times 60 \times 20 = 40 \text{ sec.}$$

Q) Find the length of the bridge, which a train 130 m long and travelling at 45 kmph can cross in 30 seconds?



$$D = S \times T$$

$$= \frac{25}{2} \times 36$$

$$= 25 \times 15$$

$$\frac{45 \times 1000}{60 \times 60} = \frac{25}{2}$$

$$130 + x = 375 \rightarrow x = \underline{\underline{245 \text{ m}}}$$

Q) A train covers a distance of 12 km in 10 min. If it takes 6 seconds to pass a telegraph post, find the length of train?

$$\frac{12 \times 1000}{60 \times 60}$$

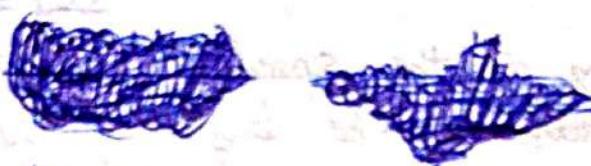
$$= 20 \text{ m/s}$$

$$\rightarrow \therefore 20 \times 6$$

$$= \underline{\underline{120 \text{ m.}}}$$

Q) A train 137 m and 163 m in length are running towards each other on parallel lines, one at the rate of 42 km/h and another at 48 km/h. In what time will they be clear of each other from the moment they meet.

$$T = \frac{D}{S} =$$



$$137 + 163 = 300$$

$$42 \times \frac{1000}{60 \times 60} + 48 \times \frac{1000}{60 \times 60} = \frac{50}{2}$$

$$\therefore \frac{300}{50} = 12 \text{ sec}$$

Q) A train 100 m long takes 6 sec to cross a man walking at 5 kmph in a direction opposite to that of the train. Find the speed of the train?

$$\frac{5 \times 1000}{60 \times 60} \times 6 = \frac{D}{T} \Rightarrow \frac{x+50}{36} = \frac{100}{6} \Rightarrow x = \frac{100}{6} - \frac{50}{36}$$

$$= \frac{600 - 50}{36} = \frac{550}{36} \text{ m/s}$$

$$\frac{550}{36} \times \frac{18}{5} = 55 \text{ m/s}$$

Q) A train 125 m long passes a man, running at 5 kmph in the same direction in which the train is going, in 10 seconds. Find the speed of the train?

$$(x + 5) = \frac{\frac{125}{1000}}{\frac{10}{60 \times 60}} \quad S = \frac{D}{T}$$

(Converted to km/h)

Ans,

► (Boat's speed is nearly high)

①

Boats and Streams

► Boat speed in still water = U Kmph

► downstream speed = $(U+v)$

► Stream speed = v Kmph

► upstream speed = $(U-v)$

Q) 8) The speed of a boat in still water is 12 Kmph and speed of stream is 3 Kmph if the boat is going downstream, how much time it will take to cover 60 km?

$$U = 12 \quad v = 3 \rightarrow \therefore U+v = 15$$

$$\therefore T = \frac{60}{15} = 4 \text{ hr.}$$

8) A boat speed with the current is 15 Km/h and the speed of the current is 2.5 Km/h, the speed against the current

boat

$$U+v = 15$$

$$v = 2.5$$

$$\rightarrow U = 15 - 2.5 \\ = 12.5$$

$$\therefore U-v = 12.5 - 2.5 = 10 \text{ Km/h}$$

Q) A boat running down stream covers a distance of 16 Km in 2 hours while for covering some distance upstream it takes 4 hours, what is the speed of the boat in still water.

$$S_d = \frac{16}{2} = 8$$

$$\therefore \begin{aligned} U+v &= 8 \\ U-v &= 4 \end{aligned} \rightarrow \boxed{U=6}$$

$$S_u = \frac{16}{4} = 4$$

Q) A motor boat whose speed is 15 km/h in still water goes 30 km downstream and comes back in 4 hours and 30 min. What is the speed of stream?

$$\text{Stream speed} = x \text{ km/h}$$

$$\text{downstream} = (15+x)$$

$$US = (15-x)$$

$$t_0 + t_u = 4 \frac{1}{2}$$

$$\frac{30}{15+x} + \frac{30}{15-x} = \frac{9}{2}$$

$$x \Rightarrow 5 \text{ km/h}$$

$$21 = v+u$$

$$v-u$$

Q) The speed of a boat in still water is 15 km/hr and the rate of current is 3 km/hr. The distance travelled downstream in 12 minutes is:

$$BS = 15$$

$$SS = 3$$

$$DS = 15 + 3 = 18$$

$$s \times t = d$$

$$18 \times \frac{12}{60}$$

$$21 = v+u$$

$$2.5 = v$$

$$= 3.6 \text{ km Ans}$$

$$v = u$$

$$v = v+u$$

$$v = v-u$$

$$2 = \frac{u}{2} = 0.2$$

$$2 = \frac{u}{2} = 0.2$$

①

AVERAGE

$$\rightarrow \frac{\text{Sum}}{n}$$

⇒ Average \Rightarrow sum of terms

For any AP, Average is median.

$$\text{For odd} \rightarrow \frac{n+1}{2}$$

$$\text{For even} \rightarrow \frac{n}{2}, \frac{n+1}{2} \rightarrow \text{Average} \rightarrow \frac{\left(\frac{n}{2}\right) + \left(\frac{n+1}{2}\right)}{2}$$

} Do not go for
Complex average
Method

Q) Find the average of 8, 10, 12, 14, ... 88

$$a_n = a + (n-1)d$$

$$88 = 8 + (n-1)2$$

$$\therefore n = 41 \text{ terms}$$

$$\frac{a_1 + a_n}{2} = \text{Average}$$

$$\begin{aligned} a_{21} &= a + 20d \\ &= 8 + 20 \times 2 \\ &= 48 \text{ (Ans)} \end{aligned}$$

Q) Average of 5 consecutive odd numbers is 35. Find the biggest number.

$$\dots - \quad - -$$

$$35 \quad 37 \quad 39 \quad \therefore 39 \text{ Ans}$$

Q) A student gets 52 marks in Mathematics, 53 in English and 53 in Hindi. How many marks should he/she score in Computer so that his/her average becomes 52?

$$\begin{array}{c} \textcircled{2} \quad 52 \quad \textcircled{1} \quad 53 \\ \textcircled{3} \quad 52 \quad 53 \quad 53 \end{array}$$

$$\therefore \textcircled{50} \text{ Ans}$$

Q) Average of 17 numbers is 40. If 3 is added to every number, find the new average?

$$\begin{array}{c} 40, 40, \dots, 40 \\ \text{---} \\ 17 \text{ nos} \end{array}$$

$$\begin{array}{c} 43, 43, \dots, 43 \\ \text{---} \\ 17 \text{ nos} \end{array}$$

$$\therefore \textcircled{43} \text{ Ans}$$

Q1) Average weight of 20 students increases by 0.75, when one student of weight 30 kg is replaced by a new student. Find the weight of the new student.

$$\begin{array}{ccccccc} & & & & & \rightarrow 20 & (\text{sw}) \\ 1.75 & 1.75 & & & \rightarrow 20 \times 1.75 & (\text{sw}) \\ & & & & \Rightarrow 15 & \end{array}$$

$$\therefore 30 + 15 = 45$$

Q2) Average age of four brother is 12 years. If the age of mother is also included average age increases by 5. Find mother's age.

1st method

$$\frac{a+b+c+d}{4} = 12$$

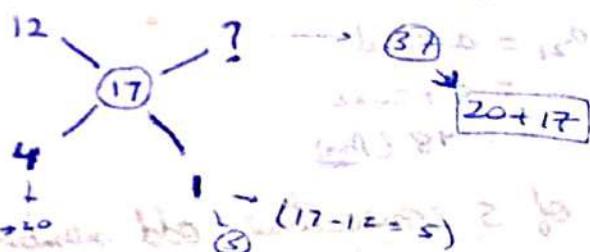
$$a+b+c+d = 48 \quad \text{---(1)}$$

$$\frac{a+b+c+d+E}{5} = 17$$

$$a+b+c+d+E = 85 \quad \text{---(2)}$$

$$\therefore E = 85 - 48 \\ = 37$$

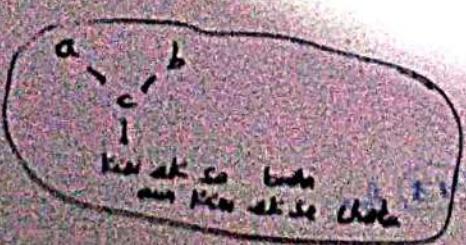
2nd Method (Alligation & mixture)



Q3) Average marks of 28 students is 50. If 8 students are removed, average increases by 5 marks. Find average marks of students removed.

$$\begin{array}{l} 28 \text{ students} \rightarrow 50 \\ 20 \text{ students} \rightarrow ? \\ 8 \text{ students} \rightarrow 50 \end{array}$$

$$\begin{array}{ccc} 55 & & 37.5 \checkmark \\ & \swarrow & \searrow \\ 50 & & ? \rightarrow 50-12.5 \\ 20 \times \frac{5}{8} & & 8=5 \rightarrow (55-50) \\ = 12.5 & & \end{array}$$



①

AP & GP

► $a-d, a, a+d, \dots$

$$a_n = a + (n-1)d$$

$$S_n = \frac{n}{2} [2a + (n-1)d]$$

- Sum of n natural numbers $\rightarrow n(n+1)$
- Sum of first n odd numbers $\rightarrow n^2$
- Sum of first n even numbers $\rightarrow n(2n+1)$
- Sum of square of first n natural numbers $\rightarrow \frac{n(n+1)(2n+1)}{6}$
- Sum of cube of first n natural numbers $\rightarrow \left[\frac{n(n+1)}{2} \right]^2$

Q1) Which term of AP $27, 24, 21, \dots$ is 0?

$$0 = 27 + (n-1)(-3)$$

$$(n=10)$$

Q2) If the first, second and last term of the AP are 5, 9, 101, respectively, find the total number of terms in the AP.

$$\begin{aligned} a &= 5 \\ d &= 4 \\ a_n &= 101 \end{aligned}$$

$$\therefore 101 = 5 + (n-1)4$$

$$(n=25)$$



Q3) Find the sum of the first 22 terms of an AP in which $d = 7$ and 22nd term is 149.

$$a_{22} = a + (n-1)d$$

$$149 = a + 21 \times 7$$

$$\therefore a = 2$$

$$S_n = \frac{n}{2} [a + a_n]$$

$$= 11(2 + 149)$$

$$= 11 \times 151$$

$$= 161$$

Multiplying with 11

With Right

$$151 \times 11$$

With Left

$$2 \times 5$$

Explain

$$5 \times 5 \rightarrow 25$$

$$2 \times 3 \rightarrow 6 \rightarrow 25$$

$$75^2 \rightarrow 5625$$

TIP

$$\Delta \text{bP} \rightarrow a_n = ar^{n-1}$$

$$S_n = \frac{a(r^n - 1)}{r-1} \quad (1) \quad | \quad S_\infty = \frac{a}{1-r} \quad (\text{for infinite GP})$$

$$S_n = \frac{a(1-r^n)}{1-r} \quad (2)$$

$\boxed{5}$

Q1) The fourth, seventh, and the tenth term of a GP is P, q, and r respectively then which of the following equation is correct?

a) $P^2 = q^2 + r^2$ b) $qr^2 = Pq$ c) $P^2 = qr$ d) $Pqr + qr + 1 = 0$



M-2 (Best)

$$\begin{aligned} P &= ar^3 \\ q &= ar^6 \\ r &= ar^9 \end{aligned} \rightarrow a^2 r^{12}$$

(n-1)

$$1, 2, 4, \textcircled{8}, 16, 32, \textcircled{64}, 128, 256, \textcircled{512}$$

P

$$q\sqrt[12]{r} = \dots$$

r

$$q^2 = P \times r \quad (\text{it satisfies})$$

Q2) The distance travelled (in m) by a ball dropped from height are $\frac{128}{9}, \frac{32}{3}, 8, 6, \dots$. How much distance will it travel before coming to rest?

$$\begin{aligned} S_n &= \frac{128/9}{1-3/4} & r &= \frac{32}{3} \div \frac{128}{9} \\ &= \frac{512}{9} \text{ m} & &= \frac{32}{3} \times \frac{9}{128} = \frac{3}{4} \end{aligned}$$

Q3) The sum of an infinite GP with positive terms is 48 and sum of its first two terms is 36. Find the second term.

$$\begin{aligned} S_\infty &= \frac{a}{1-r} = 48 \rightarrow a = 48(1-r) \quad \text{--- (1)} \\ a + ar &= 36 \rightarrow a(1+r) = 36 \\ 48(1+r)(1-r) &= 36 \end{aligned}$$

$$\begin{aligned} 48(1-r^2) &= 36 \rightarrow r^2 = \frac{1}{2} \\ \therefore 2^{\text{nd}} \text{ term} &= ar \quad \text{Put } r = \frac{1}{\sqrt{2}}, \\ &= 24 \times \frac{1}{\sqrt{2}} \leftarrow a = 24 \\ &= \textcircled{12} \checkmark \end{aligned}$$

Ratio and Proportion

Q1) Atul distributed a sum of Rs. 4500 among his son, daughter, wife and trust such that son : daughter = 2 : 3, daughter ~~—~~ : wife = 1 : 2, wife : trust = 3 : 2, find the amount given to wife

$$\frac{S}{2} : \frac{D}{3} : \frac{W}{1} = \frac{x \times 2}{x \times 1} = \frac{2x}{1}$$

$$2 : 3 : 3 : 3$$

$$\begin{array}{r} 1 : 1 : 2 : 2 \\ 3 : 3 : 3 : 2 \\ \hline 6 : 9 : 18 : 12 \end{array}$$

$$\hookrightarrow 2 : 3 : 6 : 4$$

$$\therefore 15 \text{ unit} \rightarrow 4500$$

$$1 \text{ unit} \rightarrow 300$$

$$\therefore 6 \text{ unit} \rightarrow 1800$$

Q2) If 378 coins consist of one rupee, 50 paise and 25 paise coins whose values are in the ratio 13 : 11 : 7, then the number of 50 paise coins will be

$$\boxed{\text{Value} \times \text{no.} = \text{Total Value}}$$

$$\begin{array}{r} \text{Value} \rightarrow 1 & 2 & 7 \\ \text{no.} \rightarrow 13x & 0.5 & 0.25 \\ \hline \text{Total} \rightarrow 13x & 22x & 28x \\ & 11x & 7x \end{array}$$

$$13x + 22x + 28x = 378$$

$$x = 6$$

$$22x = \underline{\underline{132}}$$

Q) The ratio of men and women working in a factory is 3:1. Their personal daily wages are in ratio of 4:5. If 15 men are employed in the work and total daily wage of men and women is ₹10, find the daily wage of 1 woman.

$$\frac{\text{no. of men}}{\text{no. of women}} = \frac{3x}{1x} = \frac{15 \rightarrow M}{5 \rightarrow W} \quad \begin{matrix} 3x = 15 \\ x = 5 \end{matrix}$$

$$\frac{\text{Daily wage of men}}{\text{Daily wage of women}} = \frac{4y}{5y}$$

$$\begin{matrix} \text{Daily wage of 1 man} \times 15 \\ + \text{Daily wage of 1 woman} \times 5 \\ = 510 \end{matrix}$$

$$4y \times 15 + 5y \times 5 = 510$$

$$y = 6$$

$$\therefore 5y = 30 \text{ Rs}$$

Q) Father is aged three times more than his son Ronit. After 8 years, he would be twice and half times of Ronit's age. After further 8 years, how many times would he be of Ronit's age?

$$\begin{array}{rcl} F & S & \\ 2x & x & \\ (4x) & (x) & \\ \frac{3}{2}x & x & \\ \hline (4x+8) & (x+8) & \\ \end{array}$$

$$\frac{4x+8}{x+8} = \frac{5}{2}$$

$$\therefore x = 8$$

$$(4x+8) + 8 \times 5x + x \times 8$$

$$\therefore F \quad S$$

$$32 \quad 8$$

$$40 \quad 16$$

$$48 \quad 24$$

①

Chain Rule

$$\begin{array}{|c|c|c|} \hline & \text{Direct} \rightarrow 4:5 & \text{Indirect} \rightarrow 5:4 \\ \hline 7 & \xrightarrow{?} & 5 \\ \hline \end{array}$$

- 9) 3 pumps working 8 hours a day can empty a tank in 2 days. How many hours a day must 4 pumps work to empty the tank in 1 day?

Pumps	Hours	Day
3	8	2
4	?	1

Inverse ratio
 $\leftarrow 4:3$
 Inverse ratio
 $\leftarrow 1:2$

$$= 8:x$$

$\boxed{4 \times 1 \times x = 3 \times 2 \times 8}$

- 8) 39 persons can repair a road in 12 days, working 5 hours a day. In how many days will 30 persons, working 6 hours a day, complete the work?

Person	Days	Hours
39	12	5
30	?	6

$$\begin{array}{l} \cancel{30:39} = \cancel{12:x} \\ \cancel{6:5} \quad \boxed{=} \end{array}$$

$$30 \times 6 \times x = 39 \times 12 \times 5$$

$$x = 13$$

Q) If 7 spiders make 7 webs in 7 days. Then 1 spider will make 1 web in how many days.

Spiders web Days

7	7	7	equal
1	1	?	Σ
5	8		

ulta loko
↑
(Indirect proportion) $\rightarrow 1:7 = ? : x$

(direct proportion) $\rightarrow 7:1 = x:8 \Rightarrow x:8 = \Sigma:4 \rightarrow$
 $1 \times 7 \times x = 7 \times 7$ \rightarrow $x:1 = 7:1 \rightarrow$ $x = 7$

Q) 36 men can complete a piece of work in 18 days.
In how many days will 27 men complete the same work?

Men Days Work

36 18 Work

27 ?

work work work

$$27:36 = 18:x$$

$\boxed{18}$

$$x = \frac{18 \times 36}{27} = 24$$

$\boxed{24}$

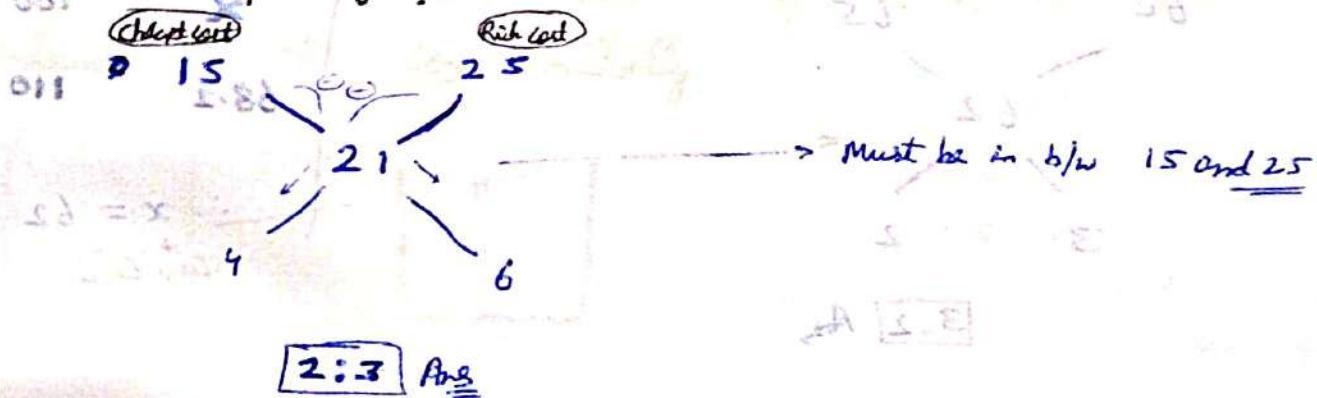
$$2 \times 24 \times 18 = x \times 3 \times 2$$

$$216 = x$$

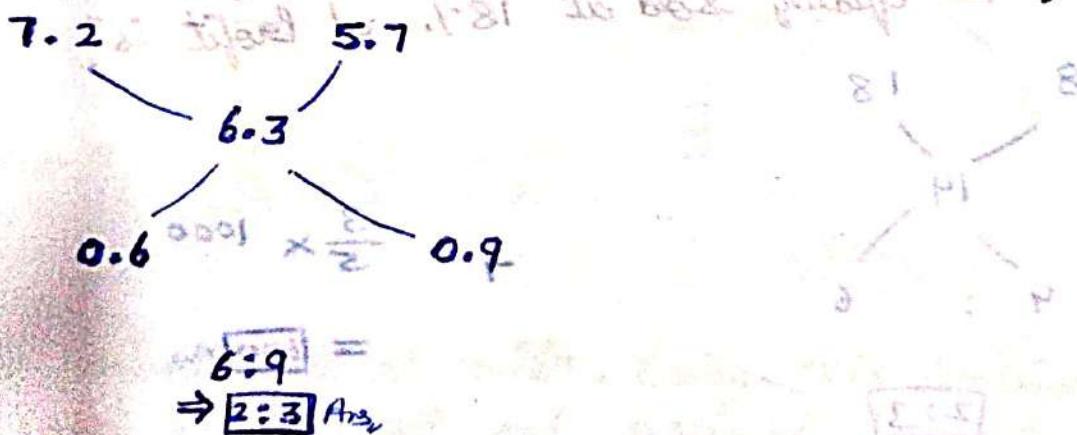
②

Alligation and Mixtures

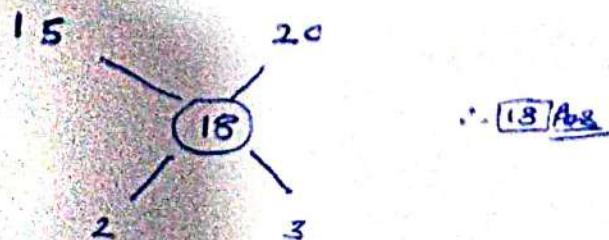
Q1) In what ratio must a grocer mix varieties of wheat cost Rs 15 and Rs 25 per kg respectively so as to get a mixture worth Rs 21 per kg?



Q2) Find the ratio in which rice at Rs 7.20 a kg be mixed with rice at Rs 5.70 a kg to produce a mixture worth Rs 6.30 a kg.



Q3) The cost of Type 1 rice is Rs 15 per kg and Type 2 rice is Rs 20 per kg. If both Type 1 and Type 2 are mixed in the ratio of 2:3, then the price per kg of the mixed variety of rice is?



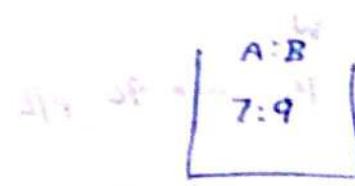
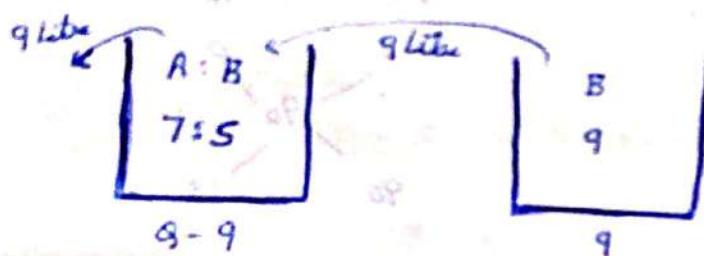
Q4) In what ratio must a grocer mix two varieties of tea worth Rs 60 a kg and Rs 65 a kg so that by selling the mixture at Rs 68.20 a kg he may gain 10%?



Q5) A merchant has 1000kg of sugar, part of which he sells at 8% profit and rest at 18%. Profit he gains 14% on the whole. The quantity sold at 18% of profit is?



Q) A can contains a mixture of two liquids A and B in the ratio 7:5. When 9 litres of mixture are drawn off and the can is filled with B, the ratio of A and B becomes 7:9. How many litres of liquid A was contained by the can initially?



$$\therefore \frac{8-9}{9} = \frac{3}{1}$$

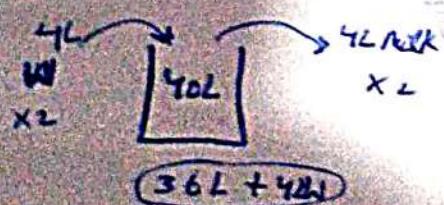
$$8 = 36L$$

$$36 \times \frac{7}{12} = 21L \text{ Ans!}$$

$$\begin{array}{rcl} A:B & & B \\ \frac{7}{12} & & 0 \end{array}$$

$$3:1$$

Q) A container contains 40L of milk. From this container 4L of milk was taken out and replaced by water. This process was repeated further two times. How much milk is now contained by the container?



$$x \left(\frac{x-4}{x} \right)^2$$

$$\begin{aligned} x &= 40L \\ y &= 4L \\ z &= 3 \end{aligned}$$

$$\therefore 40 \left(\frac{40-4}{40} \right)^3$$

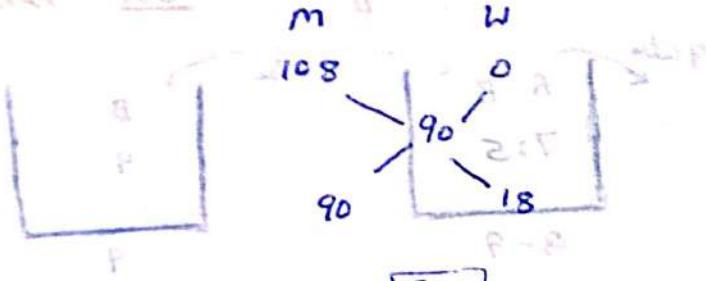
$$\Rightarrow 29.16 \text{ L}$$

Q) A mixture of certain quantity of milk with 16 L of water is worth 90 per litres, if pure milk be worth Rs 1.08 per litre, how much milk is there in the mixture.

90 per litre

(i) Assume Price of water = 0 per

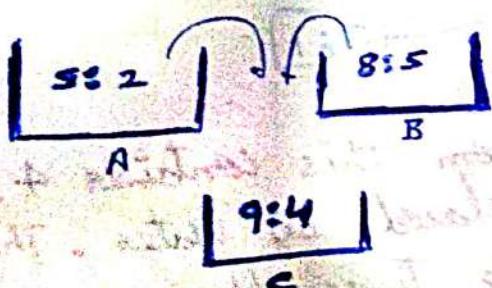
$$\begin{array}{rcl} M & & W \\ x & + & 16 \rightarrow 90 \text{ p/l} \\ M & \longrightarrow & 108 \text{ p/l} \end{array}$$



$\therefore 1 \rightarrow 16$

$$5 \rightarrow 16 \times 5 = 80 \text{ Ans.}$$

Q) Milk and Water are mixed in a Vessel A in the proportion 5:2 and in vessel B in the proportion 8:5. In what proportion should quantities be taken from the two vessel so as to form a mixture in which milk and water will be in the proportion of 9:4?



(Kei v ak dig kdy
let hon milk lekhy)

$$\therefore \frac{1}{13} : \frac{2}{91}$$

$$\therefore \frac{9}{13} : \frac{2}{13}$$

$$\therefore \boxed{7:2} \text{ Ans.}$$

$$\begin{array}{c} \frac{5}{13} \quad \frac{8}{13} \\ \frac{9}{13} \quad \frac{2}{13} \end{array}$$

①

Ages Problem

→ [Ratio & Proportions Se Nikhe (Fast Method)]

- Q1) The age of man is 4 times of his son. 5 years ago, the man was 9 times as old as his son was at that time. What is the present age of man?

$$\begin{array}{l} \text{Son's age} \rightarrow x \\ \text{Man's} \rightarrow 4x \end{array} \quad \left. \begin{array}{l} \text{Present} \\ \text{5 years ago} \end{array} \right\}$$

→ (32) Ans.

$$4x - 5 = 9(x - 5) \quad \text{given}$$

$$\therefore x = 8$$

- Q2) The ratio of father's age to the son's age is 4:1. The product of their ages is 196. What will be the ratio of their ages after five years.

$$\begin{array}{l} \text{Son's : } x \\ \text{father's : } 4x \end{array}$$

$$4x \cdot x = 196$$

$$\downarrow$$

$$x = 7$$

∴ After 5 years ratio :-

$$\frac{33}{12} = 11:4$$

- Q3) One year ago, the ratio between Sumon's and Raj's age was 4:3. One year hence, the ratio of their ages will be 5:4. What is the sum of their present ages in years.

Present,

$$\frac{4x+1}{3x+1}$$

after 1 year,

$$\frac{4x+2}{3x+2} = \frac{5}{4}$$

$$\downarrow$$

$$x = 2$$

∴ Ages are 9, 7 ∴ Sum = 16

TIP → 2 Method

Let x (The total length of the bridge)
Patio / Capacity

Patio some time ke solution hoga

$$\begin{array}{l} 2:5 \\ \swarrow \quad \searrow \\ 5:6 \end{array} \rightarrow (2:5) \times 1 \rightarrow \boxed{2:5}$$

$$(5:6) \times 2 \rightarrow \boxed{10:12}$$

New approach or Patio some time ke solution hoga

Q) 12 years ago, ratio of ages of A and B was 2:3. If ratio of their present ages is 5:6, find the present age of A.

$$\begin{array}{c} 2 \\ \swarrow \quad \searrow \\ -12 \quad 3 \\ \hline 5 \quad 6 \end{array} \rightarrow \text{Ratio} = 12 \text{ years} \\ \therefore 1 \text{ Ratio} = 4 \text{ years}$$

$$5 \times 4 \text{ years} = 20 \checkmark$$

$$x = 20 \text{ years}$$

$$x = 20 \text{ years}$$

Q) Ratio of present ages of Vaibhav and Suresh is 4:5. If the ratio of Vaibhav's age is 8 years ago and Suresh's age after 5 years, is 1:2, find the age of Suresh after 10 years

$$\frac{4x-8}{5x+5} = \frac{1}{2} \rightarrow x = 7$$

$$\therefore 5x = 35$$

45 Ans

Q) Five years ago, ratio of ages of A and B was 5:8, after 15 years, this ratio will be 3:4. Find the present age of B

suppose 5 years

A	B
(5)	(8)

$$+15 \quad 9 : 12$$

$$4R = 20 \text{ years}$$

$$1R = 5 \text{ years}$$

$$\therefore 3 \times 5 = 15 \text{ years}$$

$$\therefore \text{after 5 years} \rightarrow \boxed{45 \text{ years}}$$

Percentage

• $1 = 100\%$.	$\frac{1}{6} = 16.\overline{66}\%$.
$\frac{1}{2} = 50\%$.	$\frac{1}{7} = 14.\overline{28}\%$.
$\frac{1}{3} = 33.\overline{33}\%$.	$\frac{1}{8} = 12.\overline{5}\%$.
$\frac{1}{4} = 25\%$.	$\frac{1}{9} = 11.\overline{11}\%$.
$\frac{1}{5} = 20\%$.	$\frac{1}{10} = 10\%$.
	$\frac{1}{11} = 9.\overline{09}\%$.

Q) Alok's salary is increased by 25% . By what percentage his salary be decreased so as to return to his original salary?

Alok: $100 \rightarrow 125$

$$\frac{25}{125} \times 100 = 20\%$$

Q) If 76 is increased by 25% , what is the new number?

$$\begin{array}{ccc} 100 & \longrightarrow & 125 \\ | & & | \\ 76 & \longrightarrow & ? \end{array}$$

$$\therefore \frac{76 \times 125}{100} = 95$$

Q) The diff b/w the value of a number increased by 25% and the value of the original number decreased by 30% is 22. What is the original number?

$$\begin{array}{ccc} 55 & & \\ \swarrow & \searrow & \\ 70 & \longrightarrow & 100 - 125 \\ & & \downarrow \\ & & ? \end{array}$$

$$55 - 22$$

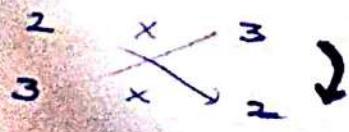
$$\therefore \frac{22 \times 100}{55} = 40$$

Q) Length of a rectangle is increased by 50% . by what percentage its breadth be decreased so there is no change in the area?

$$\text{Area} = \text{Length} \times \text{Breadth}$$

$$50\% = \frac{1}{2}$$

$$2 \rightarrow 3$$



$$\frac{1}{3} \times 100 = 33\% \text{ Ans}$$



$$\frac{1}{4} \times 100 = 25\%$$

Q) Price of rice is increased by 25%. how the consumption should be managed so there is no change in the expenditure?

$$P \times C = E$$

Original value $\frac{P}{4}$
 $25\% = \frac{1}{4}$ So $\frac{5}{4}$ value $= 20$
 $4 \rightarrow 5$

$$\downarrow 1/5 = 20\% \text{ decrease}$$

$$X \times 11 = E$$

$$X \times 11 = E$$

$$X \times 12 = E$$

$$X \times 12 = E$$

$$X \times 12 = E$$

Q) Price of rice is increased by 20%. by which percentage the consumption should be decreased so there is 10% increase in the expenditure?

$$P \times C = E$$

$$100 \times 1 = 100$$

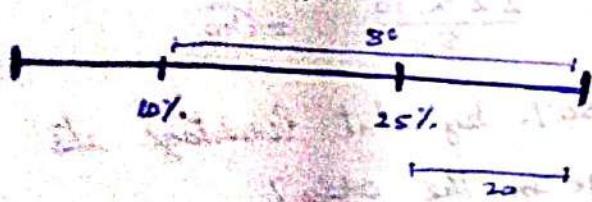
$$120 \times x = 110$$

$$\frac{11}{12}$$

$$\therefore 1 - \frac{11}{12} = \frac{1}{12}$$

Last 2 are best method we take taking 100 as base percentage method use marks in table

Q) A student got 10% marks and failed. another student got 25% marks and failed by 80 marks, another student got 20 marks, another student got 60 marks. Find the pass percentage.



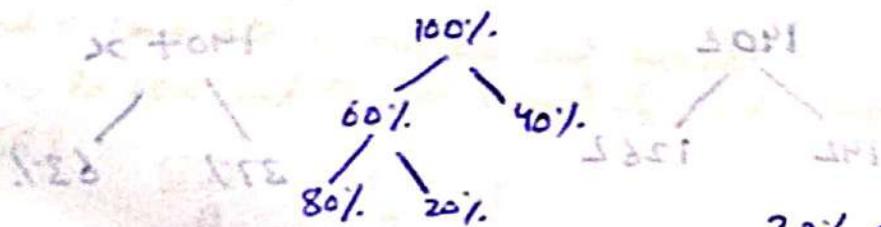
$$\therefore 100\% \rightarrow \frac{60}{15} \times 100 = 400$$

$$\therefore 25\% + 20 \text{ marks}$$

$$\therefore 100 + 20 = 125$$

$$\therefore \frac{125}{400} \times 100 = 30\%$$

Q) Patel has several number of mangoes, 40% of which are rotten. He gives 80% of the remainder to a friend and has 90 left. How many apples did he have in the begining?



$$100\% = \text{Total}$$

$$60\% = \text{Total} \times \frac{60}{100} = \text{Total}$$

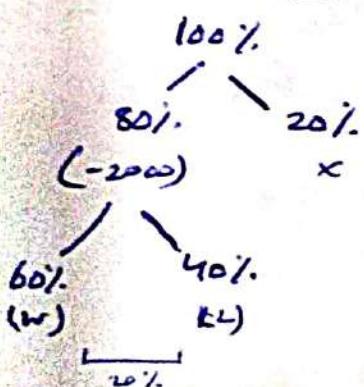
$$20\% \text{ of } 60\% \text{ of } 100\% = 90$$

$$\frac{20}{100} \times \frac{60}{100} \times 100 = 90$$

$$\text{Total} = \frac{90 \times 100 \times 100}{20 \times 60}$$

$$\text{Total} = 750 \text{ Ans.}$$

Q) In an election b/w two candidates, 20% voters didn't cast their votes, ~~2000~~ out of which 2000 voters got invalid. The winning candidate got 60% of valid votes, and won by 8000 votes. Find total number of voters enrolled in the election.

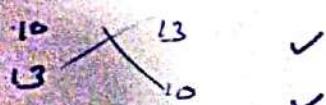


$$20\% \text{ of } (80\% \text{ of } 100\% - 2000) = 8000$$

$$100 = 52500 \text{ Ans.}$$

Q) Due to increase in the price of sugar by 30% a man can buy 6 kg less for rupees 520. Then the original price per kg is?

$$P \times C = E$$



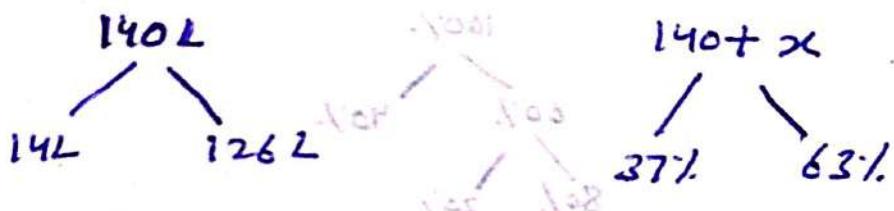
$$3 \text{ unit} \rightarrow 6 \text{ kg}$$

$$1 \text{ unit} \rightarrow 2 \text{ kg}$$

$$3\% \rightarrow \frac{3}{10}$$

$$\frac{520}{26} = 20 \text{ Ans.}$$

Q) A mix of 140L contains 10% water. How much water must be added to make the water 37% of the resulting mixture?



$$63\% = 126L$$

$$100\% = \frac{126}{63} \times 100 = 200$$

$$\therefore 140+x = 200$$

$$\therefore x = 60L \text{ Ans}$$

①

Partnership

② A → 200 for 1 Month & then 500 for 9 Month
 B → 700 for 3 Month & then 100 for 7 Month

$$\begin{aligned} & \hookrightarrow (200 \times 1) + (500 \times 9) : (700 \times 3) + (100 \times 7) \\ & = (200 + 4500) : 2100 + 700 \\ & = 4700 : 2800 \\ & \boxed{23:24} \quad (\text{No loss split here}) \end{aligned}$$

Q) A, B, and C come into a business and invested Rs 1600, Rs 1800 and Rs 2300 respectively. Find A's share if total Profit is Rs 1938?

$$\begin{array}{ccc} 1600 & 1800 & 2300 \\ \text{A} & \text{B} & \text{C} \\ 16 & : & 18 : 23 \\ \downarrow \oplus & & \\ 57 & \rightarrow & 1938 \end{array}$$

$$\frac{1938 \times 16}{57} = \boxed{544} \quad \text{Ans}$$

$$\frac{16}{(A's \text{ Profit})} \rightarrow \frac{1938}{57} = \boxed{544} \quad \text{Ans}$$

Q) A, B and C come into a business. A advances Rs 1200 for 4 months, B Rs 1400 for 8 months and C Rs 1000 for 10 months. If total profit is Rs 585 altogether, find C's share.

$$(1200 \times 4) : (1400 \times 8) : (1000 \times 10)$$

$$\begin{array}{c} 12 : 28 : 25 \\ \downarrow \oplus \\ 65 \end{array} \rightarrow 585$$

$$\therefore C's \text{ share} \rightarrow \frac{585}{65} \times 25 = \boxed{225}$$

Q) A starts a business with Rs 2000. B joins him after 3 months with Rs 4000. C puts a sum of Rs. 10,000 in the business for 2 months only. At the end of the year, the business gave a profit of Rs 5600. Find B's share.

$$(2000 \times 12) : (4000 \times 9) : (10000 \times 2)$$

$$\begin{array}{c} 12 : 18 : 10 \\ \downarrow \oplus \\ 40 \end{array} \rightarrow 5600 \quad \frac{220}{40} \times 18 = \boxed{2520}$$

② ~~Read no no date
at the same
place~~ ← TRUE DISCOUNT ~~Expense & loss to Purchaser~~

TD → True discount
PW → Present worth
P → Principle
SI → Simple Interest
R, T → Rate, Time

- $PW = \frac{X(P - RT)}{100}$ $TD = \frac{P - PW}{5}$ $\frac{(P)}{105} \rightarrow \text{Sum} \rightarrow \frac{X(RT)}{105} \rightarrow SI \rightarrow \frac{P + SI}{105} \rightarrow \text{Amount}$
- $P(\text{sum}) = \frac{SI \times TD}{SI - TD}$

9) Calculate the Present worth of Rs 20,000 due 2 years and at the rate of interest of 10% per annum.

$$\begin{aligned} PW &\xrightarrow{\frac{XRT}{100}} TD \rightarrow 20,000 \\ \text{Let } 100 &\xrightarrow{\frac{X2 \times \frac{10}{100}}{100}} 20 \rightarrow 120 \quad \frac{20,000}{120} \times 100 \\ (1 \times 200) : (2 \times 100) : (P \times 100) &= 16666.67 \checkmark \end{aligned}$$

8) Calculate the % rate of interest for an amount of Rs 10,000 due 6 months and the true discount hence is Rs 1000.

$$\begin{aligned} PW &\xrightarrow{\frac{XRT}{100}} TD \rightarrow P \cancel{\text{is 6m}} \\ \frac{99000}{10000} &\xrightarrow{\frac{R}{100}} 10,000 \quad \frac{R}{100} = \frac{1000}{9000} \\ &= 11.11\% \quad (6 \text{ months}) \end{aligned}$$

8) The true discount on a certain sum due 3 years hence is Rs 250, and the simple interest on the same sum for the same time and at the same rate is Rs 375. Find the sum.

$$\text{Sum} = \frac{250 \times 375}{125} = 750 \text{ Ans.}$$

$\Rightarrow 22.22\%$

Profit and Loss

• Cost Price (CP)

• Selling Price (SP)

$$\begin{aligned} \text{Profit} &= SP - CP \\ \text{Loss} &= CP - SP \end{aligned}$$

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

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

$$0.022 = 95$$

$$0.022 = 92$$

Q) The ratio of CP and SP is 4:6, what is Profit Percentage?

$$CP = 4$$

$$SP = 6$$

$$\text{Profit \%} = \frac{6-4}{4} \times 100 = 50\%$$

$$\triangleright SP = \frac{100 \pm (P/L)\%}{100} \times CP$$

$$\triangleright CP = \frac{SP \times 100}{100 \pm (P/L)\%}$$

Q) A man buys a cycle for 1400₹ and sell it at a loss of 20%. What is the Selling Price?

$$SP = \frac{100 - 20}{100} \times 1400 = 1120$$

$$(M2) \rightarrow \text{Let's use our old Profit Percentage} \div CP = 100\%$$

$$\frac{1400}{x} = \frac{80}{100}$$

$$0.08x = x = \frac{1400 \times 80}{100} = 1120$$

Q) A person buys a table at Rs 400 and sells it for Rs 500. What will be his gain percentage?

$$\begin{aligned} (M1) \quad \text{Profit \%} &= \frac{100}{400} \times 100 \\ &= 25\% \end{aligned}$$

$$(M2) \quad \frac{400}{x} = \frac{100}{100}$$

$$x = 25\%$$

a) Alfred buys an old scooter for Rs 4700 and spend Rs 800 on its repair, if he sells the scooter for Rs 5800 his gain percent is?

$$CP = 5500 \\ SP = 5800 \rightarrow \text{Profit \%} = \frac{300}{5500} \times 100$$

$$\frac{300}{5500} \times 100 = \frac{30}{55} = \frac{6}{11} = 54\%$$

b) A gold chain is sold at Rs 16,000 at loss of 20%. what is the cost price of gold chain?

$$(i) \frac{16000 - 20}{100 - 20} = 20,000$$

$$(ii) CP = 100 \text{ Rs} \\ \frac{x}{100} + 100 = 92 \\ \frac{x}{100} = 16,000 - 80 \\ \frac{x}{100} = 16,000 - 80 \\ \therefore x = \frac{100 \times 16,000}{80}$$

c) By selling an ipod for Rs 2800 shopkeeper makes profit of 40%. then what will be its profit percentage, if he sold it for Rs 2200?

$$CP = \frac{SP \times 100}{100 + 40} \\ = \frac{2800 \times 100}{140} \\ = 2000$$

$$\text{Profit \%} = \frac{200}{2000} \times 100 \\ = 10\%$$

$$(iii) CP = 100 \text{ Rs} \\ \frac{2800}{100} = 140$$

$$2200 \times x$$

$$\therefore x = 110\%$$

$$\therefore 100 + 10\% \text{ Profit}$$

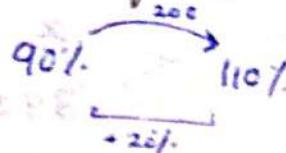
d) By selling an article for Rs 720 man loses 10%. at what price should he sell it to gain 5%?

$$\begin{array}{cc} \text{Rs} & \% \\ 720 & \times \\ x & 90\% \\ & 105\% \end{array}$$

$$x = \underline{\underline{840}}$$

Q) An ipod was sold at loss of 10%. It was observed that if the S.P. was Rs 200 more the profit made would have been 10%. What is the actual selling price of the ipod?

$$\begin{array}{l} 20\% \\ \text{---} \\ 90\% \\ \text{---} \\ x \end{array}$$



$$\therefore x = \frac{200 \times 90}{20} = 900 \text{ Rs}$$

Q) Harjit purchased 8 apples for Rs 20 and sells 7 apples for Rs 20 then find gain percentage?

Rs	object
20	8
20	7

(object to sell lots by using LCM)

$$\begin{array}{r} 20 \times 7 \\ 20 \times 8 \\ \hline 56 \qquad 56 \end{array} \rightarrow \begin{array}{r} 140 \\ 160 \\ \hline 56 \qquad 56 \end{array}$$

$$\% \text{ Profit} = \frac{160 - 140}{140} \times 100$$

$$= 14 \frac{2}{7} \%$$

Q) Liji sold 16 pens at cost of 20 pens, what is the profit or loss percentage made by him?

$$(P/L)\% = \frac{m - m}{m} \times 100$$

$$= \frac{20 - 16}{16} \times 100$$

$$= 25\%$$

→ (so Profit)

$$\begin{array}{l} m = 16 \\ m = 20 \end{array}$$

$$16S = 20C$$

$$S = 125C$$

$$S = 125C \rightarrow \times 100 \text{ for Prof}$$

$$\therefore \underline{25\% \text{ Profit}}$$

Q) A shopkeeper expect a gain 22.5% on his cost price if his sale was 392 then find his profit?

$$\begin{array}{rcl} \text{CP} & = & 100 \\ 122.5\% & & x \\ 122.5 & & 392 \end{array}$$

$$x = \frac{392 \times 100}{122.5} = 320$$

Profit = SP - CP
= 392 - 320
= 72

$$\begin{array}{ccc} 32 & 0.21 & \leftarrow \\ 32 & 0.21 & \end{array}$$

$$0.01 \times \frac{0.21 - 0.20}{0.21} = \text{Required } X$$

$$0.01 \times \frac{0.21 - 0.20}{0.21} = X \times 100$$

$$0.01 \times \frac{0.01}{0.21} = X \times 100$$

$$X \times 100 = ?$$

Q) At what rate per annum will be sum of money double in 20 years.

$$\therefore R = \frac{100}{20} = 5\% \text{ Ans}$$

$$R = \frac{100}{N} = 5\% \text{ Ans}$$

Q) A man borrow Rs-1000 from a bank at 10% per annum for 2 years. Find Simple interest and compound interest?

$$SI \text{ for 1st year}, \quad \frac{1000 \times 1 \times 10}{100} = 100$$

$$SI \text{ for 2nd year}, \quad \frac{1000 \times 1 \times 10}{100} = 100 \quad \left. \right\} \rightarrow 200 \text{ for 2 years}$$

$$CI \text{ for 1st year}, \quad \frac{1000 \times 1 \times 10}{100} = 100$$

$$CI \text{ for 2nd year}, \quad \text{here } P = 1000 + 100 = 1100 \\ \therefore \frac{1100 \times 1 \times 10}{100} = 110 \quad \left. \right\} \rightarrow 210 \text{ for 2 years}$$

► SI

CI

$$SI = \frac{PNR}{100}$$

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

$$TA = P + SI$$

$$CI = P \left(1 + \frac{R}{100}\right)^n - P$$

Q) A man borrow Rs 1000 from a bank for 2 years at the rate of 5%. Per annum. End the CI?

$$a + b + \frac{ab}{100}$$

$$a = 5 \\ b = 5$$

$$= 5 + 5 + \frac{5 \times 5}{100}$$

$$= 10.25\%$$

$$100\% \text{ of } 1000 \text{ Rs}$$

$$10.25\%$$

$$\therefore \boxed{x = 102.5}$$

If Q asks for 3 years

$$2 \text{ years } 3 \text{ years}$$

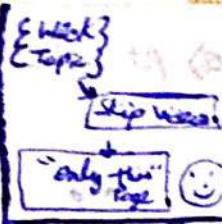
$$10.25\% \text{ of } 5$$

$$a \quad b$$

$$10.25\% \text{ of } 102.5$$

$$10.25\% \text{ of } 102.5$$

Simple Interest and Compound Interest



$$\boxed{\Delta} \quad \Delta = \frac{P \times N \times R}{100}$$

$$\Delta = \frac{P \times N \times R}{100}$$

- Q) What is the interest earned by Raj on an amount of Rs 15000 in 10 months at 5% p.a per annum?
- \downarrow *Interest is calculated on the principal amount for the given time period.*
- $(\frac{10}{12}) \text{ year}$ $\therefore SI = \frac{15000 \times 10 \times 5}{100 \times 12} = 6250 \text{ Rs}$

- Q) A person took some amount with some interest for 2 years but increase the interest for 1%. He paid Rs 120 extra than how much amount he took?

$$N = 2 \text{ years}$$

$$1\% \rightarrow 2 \text{ years} \rightarrow 120 \text{ Rs}$$

$$2\% = 120 \text{ Rs}$$

$$1\% \rightarrow \frac{120}{2} = 60 \text{ Rs}$$

$$1\% \rightarrow 60 \text{ Rs}$$

$$x = 60 \times 100$$

$$= 6000 \text{ Rs}$$

$$\frac{120}{2} = 60 \text{ Rs}$$

- Q) Consider a sum of money at SI to Rs 955 in 4 years and Rs 1055 in 5 years. Find Principle amount?

$$\text{Rs } 955 \text{ in 4 years} \quad \text{--- ①}$$

$$\text{Rs } 1055 \text{ in 5 years} \quad \text{--- ②}$$

$$\text{②} - \text{①}$$

$$\text{Rs } 100 \text{ in 1 year} \quad \text{--- SI}$$

$$955 \text{ in 4 years}$$

$$TA = P + SI \quad \text{--- 4 years}$$

$$100 \times 4 = 400 \text{ Rs}$$

$$955 = P + 400$$

$$\therefore P = \underline{\underline{555}}$$

- Data Interpretation → Easy hi, No need of video/Notes (even before exam)
→ Just 3 min video
 - Number Systems → Just bring wash (video →)
 - Clock Problem → Just write formula in mind (Bring wash video)
→ Before Test
- Ye 3 topic se bas formulas dinoq na seekh le (aur video exam ke ek din Path)

Clock Problem

take mod
of that

► Angle b/w Hour hand and Min hand \Rightarrow

$$\theta^\circ = \left(\frac{11}{2} \text{ min} - 30H \right)$$

a) Angle at 3:40?

$$\frac{11}{2}(40) - 30 \times 3$$

$$= 130^\circ$$

a) At what angle the hands of a clock are inclined in 15 minutes Past 5?

5:15

$$\theta = \frac{11}{2}(15) - 15 \times 30$$

$$= \left| 88\frac{1}{2} - 150 \right|$$

$$= 67\frac{1}{2}^\circ$$

a) Find the reflex angle between the hands of a clock at 10:25?

10:25

$$\theta = \frac{11}{2}(25) - 10 \times 30$$

$$= 162\frac{1}{2}$$

$$\begin{array}{l} \text{∴ } 360 - 162\frac{1}{2} \\ = 197\frac{1}{2} \end{array}$$

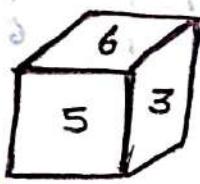
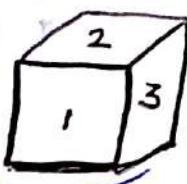
②

Cubes and Dice

TIP → Don't due ka mukh ka clock-wise direction me likh do, phir pto kaste karte off karo sa mukh.

Q1) Which digit will appear on the face opposite to the face with number

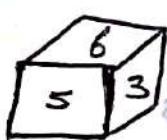
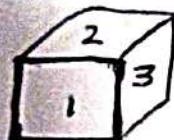
1?



3
3
1
5
2
6

∴ 5 Ans,

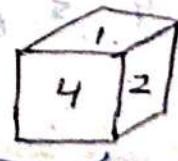
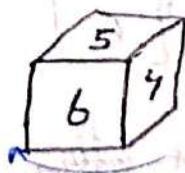
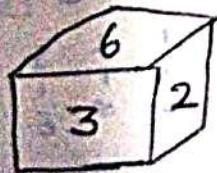
Q2) Which digit appears on the face opposite to the face with number 4?



3
3
1
5
2
6

∴ 3 Ans

Q3) Which number is on the face opposite to 6? → we cube uthe same 6 common na ho



4
4
1
2
5

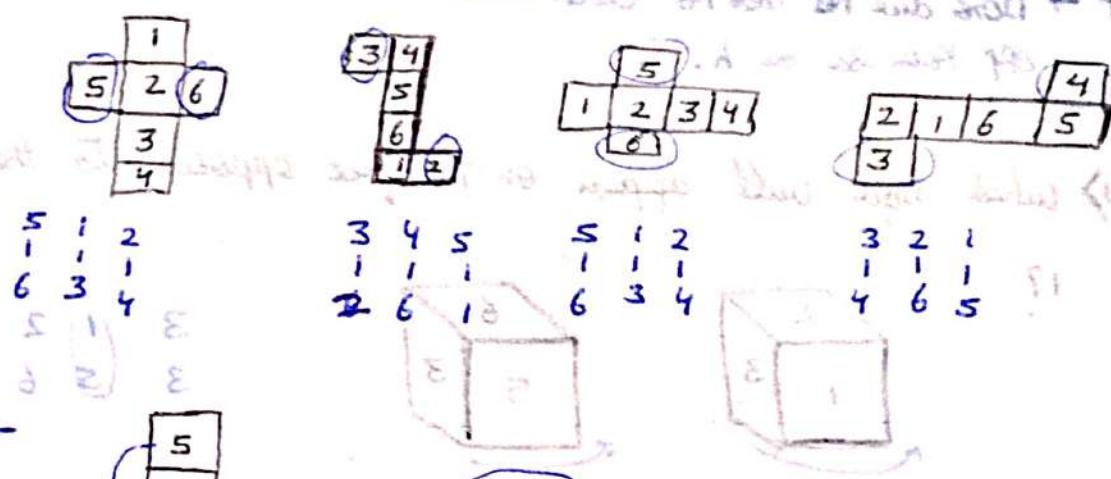
∴ 1 Ans

8

cube and cube

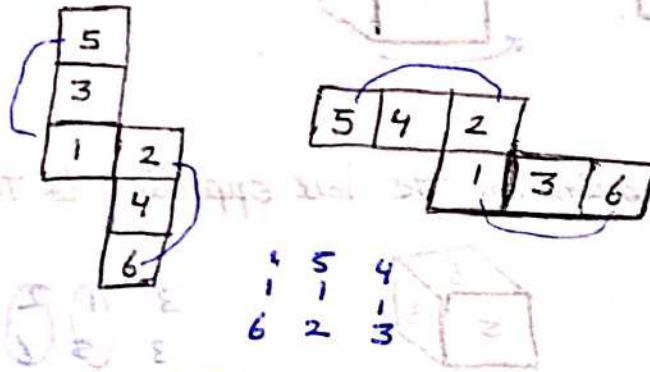
TIP → ~~Unfolding cubes are easier than forming them~~ ~~then kiske opposite to, 3 ways~~
 dekha :-

Way 1 (when 4 in line) :-

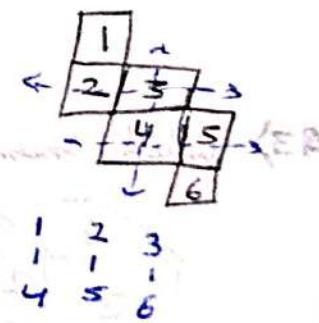
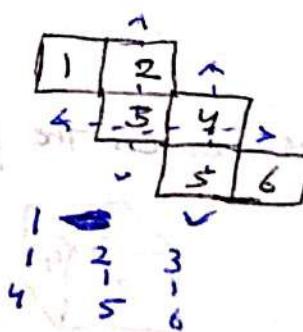
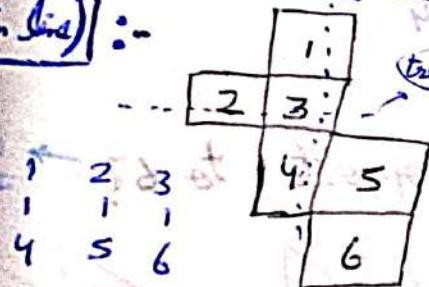


Way 2 (when 3 in line) :-

5 2 3
1 1 1
1 6 4



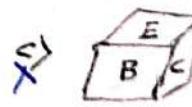
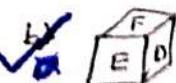
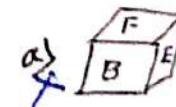
Way 3 (when 2 in line) :-



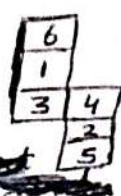
a) Identify the cube formed after folding the unfolded cube



A F E
D B C



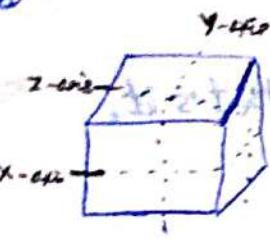
b) Which number will be opposite to 2, if the given picture will be folded to form a cube



6 1 4
3 2 5
→ 3 ← 4
✓ 5 ↓ 5

↓ 5

④



Y-axis

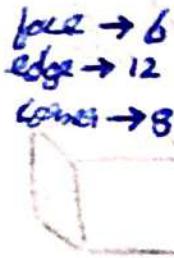
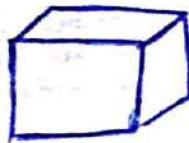
Z-axis

X-axis

Z-axis

m cuts $\rightarrow n+1$ pieces

$$\begin{array}{ccc} x & y & z \\ \downarrow & \downarrow & \downarrow \\ 1 & 1 & 0 \\ \downarrow & \downarrow & \downarrow \\ 2 \times 2 \times 1 = 4 \text{ Piece} \end{array}$$

face $\rightarrow 6$ edge $\rightarrow 12$ corner $\rightarrow 8$

Q1) Find the maximum number of pieces obtained when a cube undergoes 9 parallel cuts.

a) 10 b) 16

~~c) 64~~ d) None

$$\text{try to equal cuts } \left\{ \begin{array}{l} 5 \leftarrow x \\ 8 \leftarrow y \\ 4 \leftarrow z \end{array} \right. \quad x \quad y \quad z$$

$$3 \quad 3 \quad 3$$

$$4 \quad 4 \quad 1$$

$$4 \times 4 \times 4 = 64$$

Q2) Find the maximum number of pieces obtained when a cube undergoes 10 parallel cuts.

a) 11 b) 64 ~~c) 80~~ d) None

$$x \quad y \quad z$$

$$3 \quad 3 \quad 4$$

$$4 \quad 4 \quad 1$$

$$4 \times 4 \times 5 = 80$$

Q3) How many cuts are required to make 512 pieces of a cube?

a) 512

$$\begin{matrix} \downarrow \\ 512 \\ \times \end{matrix}$$

~~b) 511~~

$$\begin{matrix} \downarrow \\ 512 \\ \checkmark \end{matrix}$$

$\Leftrightarrow 2^{56}$

$$\begin{matrix} \downarrow \\ 2^{57} \\ \times \end{matrix}$$

d) None

$$x \quad y \quad z$$

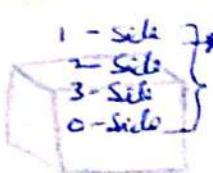
$$511 \times 0 \times 0$$

$$\begin{matrix} \uparrow & \uparrow & \uparrow \\ 512 \times 1 \times 1 & = 512 \end{matrix}$$

or

127 ~~× 1 × 0 cuts~~

⊕ coloring of cube

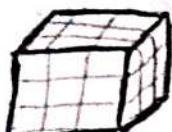


1 - side 7g (they are kite side colors h)

2- سیل
3- سیل
0- سیل

(they ask kite side twice h)

TIP → Just learn the formula, and that's it.



$n \rightarrow n_0$ of ~~one~~ kite to kite
kite by kite

$$n = 3 \text{ (as } 3 \times 3 \text{ will be)}$$

$a, b, c \rightarrow$ length,
width,
height

CUBE

$$1 \rightarrow 6(n-2)^2$$

$$z \rightarrow 12(n-2)$$

3 → 8

$$0 \rightarrow (n-2)^3$$

CUBOID

$$1 \rightarrow 2 [(a-2)(b-2) + (b-2)(c-2)]$$

$$+ (c-2)(a-2)]$$

$$2 \rightarrow 4(a+b+c-6)$$

$$w \rightarrow \infty$$

$$o \rightarrow (a-2)(b-2)$$

①

Calendar

- In 1 week = 7 days

1 year = 52 weeks

+
1 odd day (i.e. extra)

Leap year = 52 weeks

+
2 odd days

► Ordinary year = 28th Feb

► Leap year = 29th Feb

► 0 = Sunday

1 = Monday

2 = Tuesday

3 = Wednesday

4 = Thursday

5 = Friday

6 = Saturday

chart code

0	3	3	6	1	4	6	2	5	0	3	5
S	F	M	A	M	J	J	A	S	O	N	D

► 1600 - 1699 → 6

1700 - 1799 → 4

1800 - 1899 → 2

1900 - 1999 → 0

2000 - 2099 → 6

Q1) What was the day of the week on 26th January 1947?

- a) Monday
- b) Sunday

- c) Thursday
- d) Wednesday

$$\text{Step 1} = \text{Year} + \text{Month} + \text{Day}$$

$$4) 47(11)$$

$$\begin{array}{r} 4 \\ 4 \\ \hline 3 \end{array}$$

$$(extra. 0.5) \quad \begin{array}{r} 26 \\ 0 \end{array}$$

$$\text{Step 2} = \text{Year} + \text{Month} + \text{Day}$$

- ① To year block last 2 digit
- ② divide by 4 to get last 2 digit, & if exact 0, write it.

- ③ Write date

$$84 \quad \begin{array}{r} 52 \\ 0 \end{array} = \text{④ Code of Month} \rightarrow \boxed{0} \rightarrow 0$$

$$84 \quad \begin{array}{r} 52 \\ 0 \end{array} = \text{⑤ Code of Year} \rightarrow \frac{1900}{1947} \rightarrow 0$$

$$\text{Step 3} = \text{Year} + \text{Month} + \text{Day}$$

$$7) 84(12)$$

$$\begin{array}{r} 84 \\ 14 \\ \hline 0 \end{array}$$

Step 4 = Easy procedure

$$\begin{array}{r} 0 \\ 0 \end{array} \rightarrow \boxed{\text{Sunday}}$$

Q2) Today is Monday. after 30 days it will be?

$$7) 30(4) \text{ remainder} = 2$$

$$\begin{array}{r} 28 \\ 2 \end{array} \rightarrow \text{Monday} \boxed{\text{Wednesday}}$$

$$\begin{array}{r} 0 \\ 0 \end{array} \rightarrow \text{Tuesday} = 2$$

$$\begin{array}{r} 0 \\ 0 \end{array} \rightarrow \text{Wednesday} = 3$$

$$\text{January} = 0$$

$$\text{February} = 1$$

$$\text{March} = 2$$

Q3) January 1st 2008 is Tuesday. what day of the week lies on January 1st 2009.

$$\begin{array}{ccccccccc} 2 & 0 & 2 & 5 & 3 & 1 & 3 & 2 & 0 \\ \downarrow & \downarrow \\ \text{leap year} \rightarrow & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 \end{array}$$

\therefore add Wednesday here but skip one at 29th/26,

$\rightarrow \boxed{+1} \text{ extra}$

$$\downarrow \leftarrow \text{PPDI} - 0031$$

$$\boxed{\text{Thursday}}$$

$$\leftarrow \text{PPTI} - 0051$$

$$2 \leftarrow \text{PPSI} - 0081$$

$$0 \leftarrow \text{PPPI} - 0071$$

$$3 \leftarrow \text{PPSI} - 0055$$

1

Permutations and Combinations

Q) How many 4 digit numbers are possible with the digits

a) 2, 3, 4, 5, 6, 8, 9

(i) Digits can not be repeated

$$\rightarrow 7 \times 6 \times 5 \times 4$$

(ii) Digits can be repeated

$$\rightarrow 7 \times 7 \times 7 \times 7$$

b) 1, 2, 3, 4, 5, 6, 0

$$(i) \rightarrow 6 \times 6 \times 5 \times 4$$

$$(ii) \rightarrow 6 \times 7 \times 7 \times 7$$

Q) How many 3 digit no. greater than 4000 can be made with the digit 2, 3, 4, 0, 5, 6 (No Repetition)

$$3 \times 5 \times 4$$

Q) How many 4 digit numbers are possible with the digit 0, 1, 2, 3, 4, 5, 6 which are divisible by 5? (No Repetition)

$$(6 \times 5 \times 4 \times 1) + (5 \times 5 \times 4 \times 1)$$

$$120 + 100$$

$$= 220 \text{ Ans.}$$

Q) In how many different ways letter of the word 'LEADING' can be arranged

7!

- If it starts with L $\rightarrow 6!$
- Start with Vowels $\rightarrow 3 \times 6!$

$$\text{BANKING} \rightarrow \frac{7!}{2!}$$

a) In how many diff ways can the letters of the word LEADING be arranged in such a way that vowels always come together.

$$5! \times 3!$$

b) From group of 12 students 5 are to be chosen for a competition.

$$12C_5$$

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

c) In how many ways can a group of 5 men and 2 women be made out of a 7 men and 3 women?

$$(7C_5 \times 3C_2)$$

d) From a group of 7 men and 6 women, Five Person are to be selected to form a committee so that at least 3 men are there in the committee. In how many ways can it be done?

$$(7C_3 \times 6C_2) + (7C_4 \times 6C_1) + (7C_5)$$

e) In how many ways can 3 Post cards can be posted in 5 post boxes?

$$5^3$$

$$\frac{15}{12} \rightarrow \text{ANSWER}$$

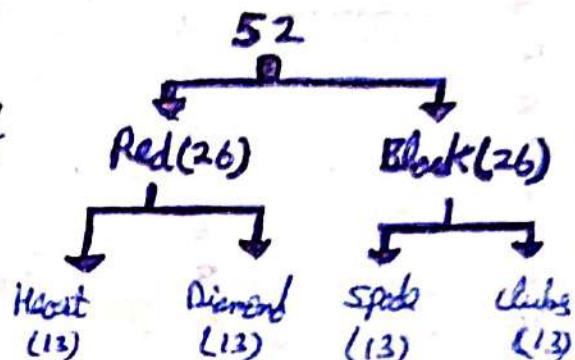
①

PROBABILITY

Q) Three unbiased coins are tossed, what is the probability of getting at most two head? 7/8

Q) Two cards are drawn together from a pack of 52 cards. The probability that one is spade and one is heart is:

$$\frac{13C_1 \times 13C_1}{52C_2} = \frac{13}{102}$$



Q) Two cards are drawn from standard deck of 52 playing cards one after another with replacement. what is the probability of getting both cards as face cards?

$$\frac{12}{52} \times \frac{12}{52} = \frac{9}{169}$$

Q) Two cards are drawn from standard deck of 52 playing cards one after another without replacement. what is the probability the both the cards are black cards?

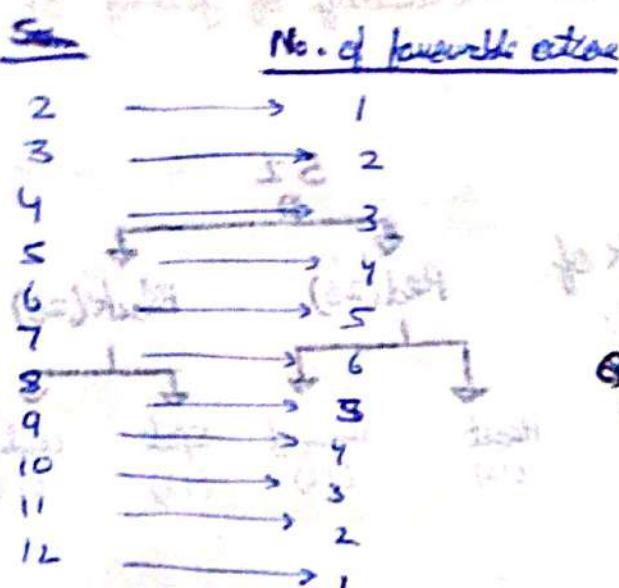
$$\frac{26}{52} \times \frac{25}{51} = \frac{25}{102}$$

Q) A card is drawn from a standard deck of 52 cards, what is the probability that the card is queen or a king.

$$\frac{4}{52} + \frac{4}{52} = \frac{8}{52}$$

DICE PROBLEM

- 2 Marks



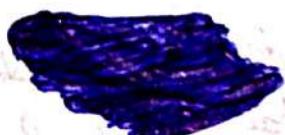
Q) What is the Probability of getting sum of 9 from two throws of dice

$$\rightarrow \frac{4}{36} = \left(\frac{1}{9}\right)$$

Q) Two dice are tossed. The Probability that the sum score is a prime number is

$$2, 3, 5, 7, 11 \\ \downarrow \downarrow \downarrow \downarrow \downarrow \\ 1 + 1 + 4 + 6 + 2 = \frac{15}{36} = \left(\frac{5}{12}\right)$$

Q) In a class, there are 15 boys and 10 girls. Three students are selected at random. The Probability that 1 girl and 2 boys are selected is:



$$\frac{15C_2 \times 10C_1}{25C_3} = \left(\frac{21}{46}\right)$$

Q) In a lottery, there are 10 prizes and 25 blanks. A lottery is drawn at random. what is the Probability of getting a Prize?

$$\frac{10}{35} = \left(\frac{2}{7}\right)$$

Q) A bag contains 4 white, 5 red and 6 blue balls. Three balls are drawn at random from the bag. The Probability that all of them are red is:

$$\frac{5C_3}{15C_3} = \left(\frac{2}{91}\right)$$

LCM and HCF

② $8, 12, 24$
 Factors of
 $8 \text{ and } 12 \rightarrow 24$

Sod 12 $\rightarrow 4$

$8, 12, 24$

(LCM) $24 \times 1 = 24$ \checkmark check is all
divide?
divide $\rightarrow 24$
No, $\cancel{4}$
 $24 \times 2 = 48$

HCF $\rightarrow 12 \rightarrow 2 \times 2 \times 3$
 $16 \rightarrow 2 \times 2 \times 2 \times 2$
 \downarrow
 $4 \checkmark$ $\rightarrow \text{LCM} \times 2 \times 2 \times 2 \times 3$
 $= 24$

Q) These numbers are in the ratio of $2:3:4$ and their LCM is 240. Find their HCF?
 Let HCF $\rightarrow x$

$$2x, 3x, 4x =$$

$4 \times 1 = 4$
 $4 \times 2 = 8$
 $4 \times 3 = 12 \rightarrow$ Sodhi table to compare

$$\Rightarrow 12x = 240$$

$x = 20$

Q) The ratio of two number is $3:4$ and HCF is 4. Find their LCM?
 HCF $\rightarrow 2$

$3x \quad 4x$

$12 \checkmark \quad 16 \checkmark \rightarrow$

$16 \times 1 = 16x$

$16 \times 2 = 32x$

$16 \times 3 = 48x$

Ans,

$\therefore 48x \div 12 \checkmark$

Q) Find the greatest number that will divide $43, 91, 183$ as they get same remainder in each case?

a) 4

b) 7

c) 9

d) 13

TIP \rightarrow agar opt. numbers se chota h, to find HCF,
 else find LCM

$(183 - 43), (183 - 91), (91 - 43)$

$$= 140, 92, 48 \rightarrow \text{find HCF}$$

\downarrow
 $7 \times 5 \times 2 \times 2$

\downarrow
 $2 \times 3 \times 2 \times 3$

\downarrow
 $2 \times 2 \times 3 \times 2 \times 2$

$\rightarrow \text{HCF} = 2 \times 2 = 4$

Q) The HCF of two numbers is 11 and LCM is 7700. If one of the numbers is 275. find the other number?

$$\text{HCF} \times \text{LCM} = a \times b$$

$$\therefore 11 \times 7700 = 275 \times b$$

$$\therefore b = \underline{\underline{308}}$$

Q) The HCF of $\frac{9}{10}, \frac{12}{25}, \frac{18}{35}$ and $\frac{21}{40}$ is?

$$= \frac{\text{HCF of}}{\text{LCM of}}$$

$$= \frac{9, 12, 18, 21}{10, 25, 35, 40} \xrightarrow{\text{HCF}} \frac{3}{1400} \text{Ans.} = \underline{\underline{3}}$$

Ans. = 3

Q) The least number which should be added to 2497 that the sum is exactly divisible by 5, 6, 4 and 3 is?

$$60) 2497 (41$$

$$\begin{array}{r} 240 \\ \hline 97 \\ -60 \\ \hline 37 \\ \end{array}$$

$$\therefore 60 - 37 = \underline{\underline{23}} \text{ Ans.}$$

$$\xrightarrow{\text{LCM of}} = 60$$

Q) What will be least number which when doubled will be exactly divisible by 12, 18, 21 and 30?

$$12: 2 \times 2 \times 3$$

$$18: 3 \times 2 \times 3$$

$$21: 7 \times 3$$

$$30: 3 \times 2 \times 5$$

$$\rightarrow 3 \times 2 \times (2 \times 3 \times 7 \times 5)$$

$$= 210 \times 6$$

$$= 1260$$

$$\therefore \underline{\underline{1260}} \text{ Ans.}$$

Q) A, B and C starts at same time in the same direction to run ~~around~~ around a circular stadium. A complete round in 252 seconds, B in 308 seconds, C in 198 sec all starting at same point. After what time will they again meet at the starting point.

$$\begin{array}{ll} \text{LCM} \rightarrow & 252: 2 \times 2 \times 3 \times 3 \times 7 \\ & 308: 2 \times 2 \times 7 \times 11 \\ & 198: 2 \times 3 \times 3 \times 11 \end{array} \rightarrow 2 \times 2 \times 3 \times 3 \times 7 \times 11 = 2772 \text{ seconds}$$

Q) The greatest possible length which can be used to measure exactly the length 7m, 3m 85cm, 12m 95cm?

$$\begin{array}{ll} \text{HCF} \rightarrow & 700 \rightarrow 2 \times 2 \times 5 \times 5 \times 7 \\ & 385 \rightarrow 5 \times 7 \times 7 \\ & 1295 \rightarrow 5 \times 7 \times 37 \end{array} \rightarrow 5 \times 7 = \boxed{35 \text{ cm}}$$

Q) The product of two numbers is 4107 if the HCF of these numbers is $\frac{37}{1}$ then the greatest number is?
Lema note,

$$37 \times a, 37 \times b$$

$$\frac{4107}{37} = 111 \text{ Ans}$$

$$\therefore (37 \times a) \times (37 \times b) = 4107$$

$$\therefore ab = 3 \rightarrow (3, 1)$$

\downarrow
(ab might be
no. to L.C.M. length)

$$\therefore 37 \times 1 \quad \& \quad 37 \times 3$$

$$= 37 \quad \text{and} \quad 111$$

$$\therefore \boxed{111} \text{ Ans.}$$

which we left in mid week to take a break.
Spent a number of days in the ~~area~~ but as
we got a chance Sun & Sat, took it easy
at the east lake. They came to take the
boat out & took us to the lake. We
had a great time.

Digital 555 2

162 x 23.2 x 5 + 005

585 x 2 = 1170

FLAS XZ ← ZPSI

七

sent to DHL at the top of return cost to United at \$8

Fig. 12. Another drawing with soft $\frac{1}{2}$ B in addition.

1

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131

三

$2 \times 58 = 2 \times 58$

$$\text{sum} = (x + \varepsilon) + (x - \varepsilon)$$

8. 10. 1938

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EXCELSIOR 1938

III & June 15

which was set in with sand to make a base & the
base & sand was to be the ~~set~~ \leftarrow set
 $\text{set} \rightarrow$ these set in 8, these 28s in base
set this will take 8ft. they were to take the
base & sand & the set \leftarrow set

$$\begin{array}{rcl} \text{rXEXEXS} & \leftarrow & 122 \\ \text{UXUXS} & \leftarrow & 280E \\ \text{UXUXS} & \leftarrow & 28P1 \end{array}$$

$$122 \leftarrow 280E \leftarrow 28P1$$

$$\text{base } 280E \leftarrow$$

base of 280E is like this \downarrow set \leftarrow
when it has to be like this \downarrow set \leftarrow
 $\text{set} \rightarrow 2P \leftarrow 280E$, not this \leftarrow set

$$\text{rXZXRXXS} \leftarrow 00T$$

* HCE

$$\text{rXZ} \leftarrow 28E$$

$$\text{rXZ} \leftarrow 2P51$$

$$\text{rXZ} = \text{rXZ} \leftarrow$$

start to add at top of column with rXZ \leftarrow set \leftarrow

rXZ \leftarrow set \leftarrow rXZ in column

*

$$\frac{\text{rXZ}}{\text{rXZ}} = \frac{101P}{5E}$$

$$2X5E + 0X5E$$

$$101P = (2X5E) \times (5X5E)$$

$$101P = 50E \times 50$$

is division of

Work without a calculator

$$\text{rXZ} \leftarrow 101P$$

101P

\rightarrow 101P \leftarrow 50E

which we got in will now be added to Δ base_1 & base_2 . A condition which is found, ~~now~~ at 13
is $\text{base}_1 \geq \text{base}_2$ at 8, $\Delta \text{base}_1 \leq \Delta \text{base}_2$ at 13
so that this will take effect. Today we're to update the
start address of the base to the new value.

$$\begin{aligned} \text{F} \times \text{E} \times \text{E} \times \text{E} \times \text{E} &\leftarrow \text{E} \times \text{E} \times \text{E} \times \text{E} \times \text{E} \\ \text{H} \times \text{F} \times \text{E} \times \text{E} \times \text{E} &\leftarrow \text{H} \times \text{E} \times \text{E} \times \text{E} \times \text{E} \end{aligned}$$

$$\text{base}_2 \leftarrow \text{E}$$

So the Δ base_2 will affect the Δ base_1
because of the fact that the address of the Δ base_2 is not yet updated.

$$\begin{aligned} \text{F} \times \text{Z} \times \text{Z} \times \text{E} \times \text{E} &\leftarrow \text{E} \times \text{Z} \\ \text{F} \times \text{E} \times \text{Z} &\leftarrow \text{Z} \times \text{E} \\ \text{F} \times \text{E} \times \text{Z} &\leftarrow \text{Z} \times \text{E} \end{aligned}$$

$$\text{base}_2 = \text{F} \times \text{Z} \leftarrow$$

+ HCF

So it is 43H left to copy in because out of total Δ base_1
it is already finished with 13H so Δ base_1 is reduced

$$\begin{array}{r} \text{4A} \\ + \text{4B} \\ \hline \text{58} \end{array}$$

$$\text{D} \times \text{F} \times \text{E} \times \text{E} \times \text{E}$$

$$\text{D} \times \text{F} \times \text{E} \times \text{E} \times \text{E} = (\text{D} \times \text{F}) \times (\text{E} \times \text{E} \times \text{E})$$

So Δ $\text{base}_1 = \text{E} \times \text{E} \times \text{E}$
is dependent on Δ base_2
and will be 0.

$$\text{E} \times \text{F} \times \text{E} \times \text{E} \times \text{E} = \text{E} \times \text{F} \times \text{E} \times \text{E} \times \text{E}$$

So Δ base_1 is 0. This base is 0.

about, with out in and out to about 3 hours + 12
steps. A + number blocks or boxes were used.
about 2000 + 3000 boxes were used in about
with them out takes 1000, today went to yesterdays
and got blocks up to the last

$$PXE\bar{E}X\bar{E}X\bar{E} \leftarrow 1225 \leftarrow 1121$$

$$UX\bar{E}X\bar{E}X\bar{E} \leftarrow 280E$$

$$UX\bar{E}X\bar{E}X\bar{E} \leftarrow 28PI$$

$$UX\bar{E}X\bar{E}X\bar{E}X\bar{E} \leftarrow 1121 \quad PXE\bar{E}X\bar{E}$$

$$blocks 5555 =$$

about 10000 + 10000 blocks still about 10000 blocks
so 2P + 21, 2023 + 8, not right with yesterdays

$$P\bar{E}Z\bar{E}X\bar{E}X\bar{E}X\bar{E} \leftarrow 00T$$

* 93H

$$P\bar{E}Z\bar{E}X\bar{E} \leftarrow 28E$$

$$P\bar{E}Z\bar{E}X\bar{E} \leftarrow 2PEI$$

$$\textcircled{m23} = P\bar{E}Z \leftarrow$$

start to 4-11 21 + 5000 in return out to blocks out (2

for advance tracking out with E as advance

return

$$\frac{21}{21} \quad 111 - \frac{1011}{111}$$

$$AXTE \times UX\bar{E}$$

$$TATE = (AXTE) \times (UX\bar{E})$$

if 111 is E = 10000

is advance

block without advance

$$EXTE \leftarrow TATE$$

$$EXTE \leftarrow 111 \times AXTE$$