3rd June 14

APTITUDE

CDAC

HOMEWORK:→

I should know tables from 1 to 20

Squares:→

I should know the squares from 1 to 25

* HOW TO FIND OUT SQUARES-

for BASE 50:

STEP I: get the difference & square it

STEP II: Substract same from 25 (when base is 50)

EXAMPLE -1:-

45

Base 50

45

5 | 5^2

20 | 25

(25-5) ←

ANS 2025

EXAMPLE :-2

43 → ~~18 09~~ | | 7^2 |

25-7

1849

(3)

~~43~~ 42

1764

(4)

41

1681

(5)

38 (1) – Andhi aaye ya toofan aaye carry ko add karneka

1444

(6)

37 (1)

1369

(7)

36 (1)

1296

* Here different bases are 50, 100, 200

STEP I: Get the difference & square it

STEP II: Add the difference to the same no.

(1)

104^2 =

10816

(2)

111 = 100 + 11 (1) ← Carry

(111+11) 21

= 12321

(3) 113

(1)

12769

(4) 125

6

15625

100 | 28

NUMBER SYSTEM:

$N = \{1, 2, 3, \ldots\}$

$x + 1 = 1 = ?$

$W = \{0, 1, 2, \ldots\}$

$x + 2 = 1$?

$I = \{\ldots -2, -1, 0, 1, 2\}$

$2x = 1$

Rational No:- → Q

(P/q) ① $p, q, \in I$

② $q \neq 0$

irrational No:- → $\overline{Q}$

$\sqrt{2}, \sqrt{3}, \sqrt{6}$ irrational no:

irrational $-\pi, e$

[Real no - Q ∪ Q̄]

NATURAL NOS → S

0 is an even no because it is divisible by 2

~~2~~	3	5	7	11	
13	17	19	23	29	
31	37	41	43	47	25
53	59	61	67	71	
73	~~83~~	87	89	97	

* A Number having exactly two positive factors is a prime no.
* A Number having more than two factors is a composite No.
* Hence 1 is neither prime nor Composite.
* ~~**~~ HOMEWORK

find all the prime no from 101 to 200.

DIVISIBILITY TEST :-

TWO :- 2

LAST digit should be divisible by 2

THREE :- 3

Sum of the digits should be divisible by 3

FOUR :- 4

last two digit should be divisible by four

FIVE :- 5

should be divisibe by 2 & 3

SIX :- 6

last three digit should be divisible by 8

FIVE - 5

last digit - 0, 5

SIX - 6

should be divisible by 2 & 3

* SEVEN - 7

The difference between the two alternate groups taken three digits at a time or a multiple

(4)

eg:- 250 200 000

56

∴ divisible by 7

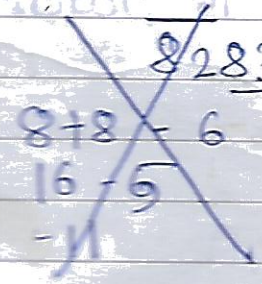
* EIGHT - 8

Last three digits should be divisible 8

* NINE - 9

Sum of digits should be divisible 9

(2)



* ELEVEN - 11

(4)

The difference between the two groups of alternate digits should be either 0 or a multiple of 11

9 1 8 0 7 1

x x x

18 - 2

16

24 - 2

⇒ 22

(3) TWELVE - 12
divisible by 3 & 4

THIRTEEN - 13
(4) Same test for seven but difference -

FOURTEEN - 14
(3) should be divisible by 7 & 2

SPECIAL NO°
360 360

It is the smallest natural no° - divided by first 15 natural no°s -

~~2,3,4~~
2,4,8 , 3,9,14 , 7,11
12 13,

BASIC FORMULAE.

1] $1 + 2 + 3 \ldots + n$

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

2] $1^2 + 2^2 + 3^2 \ldots n^2$

$= \frac{n(n+1)(2n+1)}{6}$

3] $1^3 + 2^3 + 3^3 \ldots n^3$

$\left[\frac{n(n+1)}{2}\right]^2$

★ Q- In a party of 25 people each person shakes hands with other person exactly

By logic ⇒ 1st person handshake 24
2 person handshake - 23
⋮ ⋮

$24^2 + 23^2 + 22^2 + 21^2 \cdots 1^2$

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

$\frac{24(24+1)}{2}$

$= \frac{24 \times 25}{2} = 300.$

By formulae ⇒

$\frac{n(n-1)}{2} = 300$

(Here $n = 25$

★Q- In fixed IPL 7 8 teams participated each played against all the other exactly twice find no. of matches-

1 - 7
2 - 6

$7^2 + 6^2 + \cdots 1^2$

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

$= \frac{7(8)}{2} \times 2$

$= 56$

↳ Round Robin famat.

Q7 In knock-out Boxing tournament 32 players find total no of matches.

$16+8+4+2+1 = 31$

No of matches in knockout of n-players $(n-1)$

HCF & LCM:-

56 84

2	56	84
2	28	42
7	14	21
	2	3

2	54	72	126
3	27	36	63
3	9	12	21
	3	4	7

Hcf = 2x3x3 = 18

* dangerous Numbers.

203 319

(203, 319)
(203, 116)
(87, 116)
(87, 29)
(58, 29)

* 133, 209

(133, 76)

(57, 76)

(19, 57)

(19, 38) (19, 19)

* How to identify →

Q→) Find the largest no such that 48 & 84 are divisible by that no.

48 84
36, 48
12, 36
12, 24
12, 12.

12.

Q→) Find the biggest no. such that 52, 128, R-2 & R-3
= =

for Remainder to 2 & 3
the adjustment as follows.

(52-2), (128-3)
50, 125

* In an HCF problem first adjust & then find H.C.F

50 125
75 50
50 25
(25, 25)

Que → find the greatest No- such that if 39 87 147 are divided by that no we get the same remainder?

39 87 147

Soln: (87-39) (147-87)

48 60

Hence find HCF of 48 & 60

48 60

12, 48

12, 36

12, 24

12, 12

Ans: → 12

classmate
Date
Page

TOPIC LCM

find the LCM:-

2	36	48
2	18	24
2	09	12
2	09	06
3	09	03
3	03	01
	01	01

LCM = $3 \times 3 \times 2 \times 2 \times 2 \times 2$

$= 144$

find the LCM

20, 24, 30

2	20	24	30
2	10	12	15
2	5	6	15
3	5	3	15
5	5	1	5

120

for Dangerous No:→

LCM ⇒ Prod / HCF

$$\frac{203 \times 319}{29}$$

$$\frac{133 \times 209}{19}$$

$$\boxed{\frac{133 \times 209}{19}}$$

* Find the least no which when divided by 12, 20, 24 leaves a Remainder of five each

* If the Remainder is common ans is- is common the ans is LCM + common Remainder.

* Find the smallest no when when divided by 12, 16, 20 leaves Remainder - 7, 11, 15

(common + diff)

12, 16, 20

* If the remainder is common, ans is Lcm + common R
* If the difference is common the ans is Lcm - common diff-

If the difference is common the ans is Lcm - common difference.

2 12 16 20

2 06 08 10

02 03 04 05

02 03 02 05

03 03 01 05

05 01 01 05

01 01 01

480 240 -4

1

R 236

11

Que: three electric bulbs Red, Orange, green glow after every 20, 30, 40 secs respectively after how many seconds will get together

20 30 40

= 120 · LCM

Q- find H.C.F and L.C.M of $\frac{4}{7}$ & $\frac{16}{35}$

HCF *** of fraction

$$= \frac{\text{HCF of N}}{\text{LCM of D}} = \frac{4}{35}$$

LCM $= \frac{\text{LCM of N}}{\text{HCF of D}} \quad \frac{16}{7}$

TOPIC- POWER CYCLES:

1) Power cycle of 2 → (2, 4, 8, 6)

2) '3' → (3, 9, 7, 1)

3) '4' → (4, 6)

4) '5' ↔ (5)

3	3	7	9
3			
	1	7	3

5) '6' → (6)

6) '7' → (7, 9, 3, 1)

7) '8' → (8, 4, 2, 6)

8) 9 → (9, 1)

9) 0 → (0)

10) 1 → (1)

FOUR

2, 3, 7, 8

$\frac{20 \times 25 \times 30}{5}$

100×30

$= 3000$

TAP THREE

2	20	25	30
5	10	25	15
	2	5	3

TWO

4, 9

2	20	25	30
2	10	25	30
2	5	25	30
5	5	25	15
5	1	5	3
5			

ONE

6, 1, 0, 5

★ find last digit of 2^{17}

2^{17}

$2^{17/4}$ $\quad$ 2

17/4 = Remainder = 1

Hence last digit 2

★ Find last digit of 3^{21}

$3^{21/4}$

R = 1

Hence last digit = 3.

★ 3^{62} $\quad$ $3^{\wedge 62/4}$

R = 2

Hence last digit = 9

classmate
Date
Page

* 3^{43} :. $3^{43/4}$

R = 3

1·D = 7

* 3^{44} R = 0

1·D = 1

* 7^{83} R = 3

1·D = 7

*** [4, 9] : odd power - first no
even power - second no.

9^{28}

28 → even, hence second no

1·D → 1

*** 6, 1, 0, 5 : itself is a answer

*** Example: Special

52^{99}

Two digits Hence $\bar{5}$ is MOHMAYA

MOH MAYA

Que] find the remainder when 7^{27} is divided by 10.

Observe: $36/10 - 6$

$46/10 - 6$

$52/10 - 2$

$42/10 - 2$

* Hence 10^{6} is hero and gives last digit of divend.

$7^{27}/4$

Remainder = 3

Hence L.P → 3

Que → find the remainder when

$7^{27} \div 100$

$7^1 = 07$

$7^2 = 49$

$7^3 = \cancel{35}\ 43$

$7^4 = 71$

$-x \quad -x \quad -$

$75 = 07$

$27/4 =$ Remainder -3

Hence $1.0 = \underline{43}$

Que → Find the last two digit of

$7^{64/4}$

Remainder $= 0$ 71

01

Que: find the Remainder when 5^{33} is divided by -6

$5^{33} \div 6$.

$36/6 = 6$
$46/6 = 6$
$52/6 =$

(6, 1)

$5^1 = 5/6 = 5$
$5^2 = 25/6 = 1$
$5^3 = 125/6 = 5$

* Tip: first four power = game over.

find R $3^{47}/4$ $3^{47} \div 4$.

$3^1 = 3/4 \rightarrow 3$
$3^2 = 9/4 \rightarrow 1$
$3^3 = 27/4 \rightarrow 3$

Remainder = 3

find R when $4^{96} \div 6$.

$6^1 = 6$
$6^2 = 36$ X
$6^3 = 256$

$4^1 = 4/6 : 4$
$4^2 = 16/6 : 4$
$4^3 = 64/6 : 4$

R=4

Que → find Remainder if 4^{73} is ÷ 3

4 | 3 → 1
16 | 3 → 1
64 | 3 → 1

Ans 1

★ Rule:→ Anuja

whenever any power of x+1 is divided by x then remainder is always one.

Database:→

Que→ 90-95% ? have remainder 1

TOPIC AVERAGE:→

Average = $\frac{Sum}{n}$

S = A × n

Ex: [6 + 9 + 11 + 24 + 36 + 64]

$\frac{150}{6} = \underline{25}$

Ex {1 + 2 + 3 .... 20}

$\frac{n(n+1)}{2} = \frac{20(21)}{2}$

$= \underline{10.5}$

ASK

* Ex: 3, 8, 13, 18 ... 63.

$$A.P = \frac{63}{2}\left[2(3) + 62 \times 5\right]$$

$$= \frac{63}{2}\left[6 + 310\right]$$

$$= 63\left[\frac{316}{2}\right]$$

$$= 63 \times 158$$

FORMULA $\rightarrow \frac{n}{2}\left[2a + (n-1)d\right]$

SHORTCUT METHOD FOR A.P:-

for an A.P avg = $\frac{\text{first no} + \text{last no}}{2}$

$= \frac{63+3}{2} = 33.$

find the average of odd no. between 100 - 200

$\frac{101 + 299}{2} = \underline{200}$

3 8 13 18 23 28 33 38 43 48 53 58 63

* Average Weight of class of 20 students is 58kgs 2 students weight 54 & 56 are replaced 2 new students 72, 78, respectively find new average?

Ans:→

20 - 58

2 - 54 56

2 - 72 78

18 22

$\frac{40}{20}$

= 2

58 + 2 = 60kgs new average.

* Average is a No - distributed equally among all the members.

Problem Avg marks:→

30 - 62

2 stud - 80, 90

0 → 40, 70

40 20

60

$= 100 - 200$ $\quad 101 - 198$

$\frac{101 + 199}{2} = \frac{300}{2}$

new avg - 60.

$\frac{1+2+3+4+5}{5} = 3$

$\frac{6}{2}$

Problem :→

Avg of class = 30 - 10

teacher = add. 11

formulae → NV = OA ± (n ± 1) diff.
(New value)

$10 \pm (30 \pm 1)\ 1$

$= 10 + (31$

$= 41$

Problems :→

The average marks of 77 students in a class is 61 if a new student is added the avg becomes 61.5 . find marks of new students.

⇒

$77 - 61$

$78 - 61.5$

$61 \pm (78)\ 0.5$

$= 100$

Ans: marks = 100

$77 - 61$

NV = $61 + (78)\ 0.5$

classmate
Date
Page

* 20kg's of sugar at 42 Rs/kg is mixed with 10kg's of sugar at 36 Rs/kg find price/kg of mixture.

** Group average: $\frac{A_1N_1 + A_2N_2}{N_1+N_2}$ } ALLIGATION.

$$\frac{42(20) + 36(10)}{30kg}$$

$$= \frac{840 + 360}{30} = \frac{1200}{30}$$

$$40$$

* In what ratio shall be mixed sugars at 42 Rs/kg with sugar at 36 Rs/kg to get mixture 40 Rs/kg

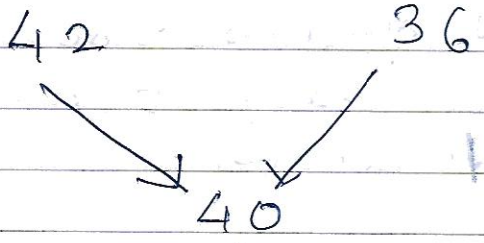
$$40 = \frac{(42)(N_1) + (36)N_2}{N_1+N_2}$$

(group average fails

~~Alligation~~ :- Mixture

4 2 — 36 / 26 20

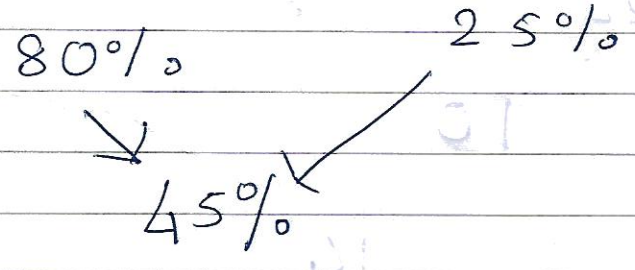
VVV IMP:→ (MIXTURE)



4 2

ANS = 2 : 1

In what ratio shall we mix 80% of acid solution with 25% soln to get 45% solution.



20 : 35

4 : 7

NOT understood well.

classmate
Date
Page

Q- In a company the average salary of 25 officers is 24000 Rs/- The average salary of NON officials is 8000 rupees if the average salary of entire company is 10,000 Rs/-

find:-

1) no of non-officials.
2) Total no of employees.

25 'O' - 24,000
'N' - 8,000
'E' - 10,000 Rs/-

24 8

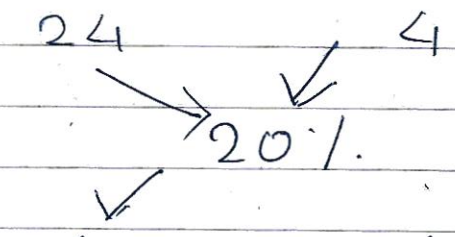
10

2 14

1 : 7

25 : 175

Q- A farmer purchase cow & goat total 5000RS. He sells cow at 24% profit & goat at 4%. Thus making overall profit of 20%.



1 : 4

4000 - goat 1000.

✱ TOPIC MEAN :-

for x & y

AM :→ $\frac{x+y}{2}$

G.M :→ $\sqrt{x \cdot y}$

H.M :→ $2xy/x+y$

Ex: 10, 40

AM = 25

GM = 20

$HM = \frac{(400)2}{50} = \frac{80\phi}{5\phi}$

HM = 16

Ex: 10, 10

AM, GM, HM = 10, 10, 10.

** All the three means are equal if no are same.

* while going from PUNE to raipur shweta's speed is 40km/hr while coming back her speed is 60km/hr. find her avg speed through out the journey?

* formula: If dist-same then avg speed

$$\frac{2xy}{x+y}$$

* While going from pune to Gondhia yukti speed is 40km/hr for first 10hrs and 60km/hr for next 10hours, then average speed throughout journey →

Formula: If time - same avg speed

** $\frac{x+y}{2}$

PERCENTAGES:-

classmate
Date
Page

Percentage	Fractions
50	1/2
25	1/4
20	1/5
10	1/10
12.5	1/8
75	3/4
80	4/5
33.33	1/3
66.66	2/3
16.66	1/6
83.66	5/6
120	6/5
125	5/4
150	3/2

★ NOTE 500
1% - 5
10% - 50

Problem No - 1

Que A no 'x' is increased by 20% then it is decreased by 20%. find the net percentage change →

x ↑ 20°
↓ 20°

100 ↑ 120

20% 120 = 120 - 24
96

net percentage change - 4%

Que 100 ↑ 30% = 130 - 39 = 9%
↓ 30%

100 ↓ 30% : 70
70 ↑ 30 = 91

net loss : 9% in both cases.

if a increase & then decreased by x percent then always is loss of

$$\left[\frac{x}{10}\right]^2 \%$$

⭐⭐⭐ In exam Munni gets 47% marks which is 10 marks more to pass in exam sheela 42% marks got 15 marks less.

Let paper of 100 marks.
47% = 47 marks.

42% ← −15 — pass marks — → 47%
+10 marks

−15 +10
= 25 marks = 5%

1% = 5 marks

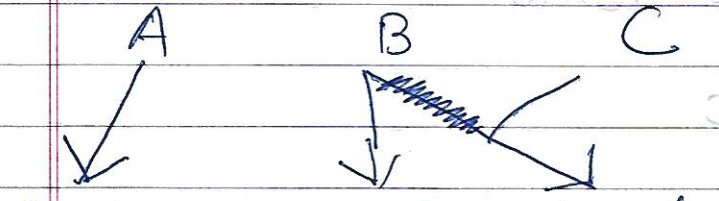
find i) total marks of paper
ii) pass percentage
iii) No of marks scored by sheela.

i) 500 marks = 5×100
ii) 45% = 42% + (15 marks = 3%)
= 45%
iii) 210 = 42×5 = 210

Note:- find 1% of thing that is given to us

(when comparision prb is used).

* In election betn two candidates every voter voted 10% votes = use NOTA option
68% voters supported A
22% voters supported B.
A won 920 votes more than B.



46% = 920 Votes

1% = $\frac{920}{46}$ = 20 Votes.

Find 1) total no of votes = 2000 Votes
2) No. of votes by B = 440 Votes
3) no of nota votes 10% = 200 Votes.

* important equations :→

$E = P \times C$

$D = S \times T$

$V = I \times R$

$A = L \times B$.

The price and consumption of tomatoes increased by 20% & 10% respectively find the percentage change in expenditure ?

ANS → ~~100 = 10×10~~

$E = 10 \times 10$

$100 = 10 \times 10$

~~10~~ $E = 12 \times 11$

132.

+32% change

* In a ckt the current & resistance increased by 30% & 20% find % change in voltage

$V = I \times R$

$V = 10A \times 10\Omega$

$V = 100$ Volts

Now New 'V' $= 13 \times 12$

$V = 156$

$+56\%$

The length of rectangle increase by 10% while the breadth decrease 20% find the percentage change in area.

→ 12% Ans

$100 = 10 \times 10$

$= 11 \times 18$

$+31$ ~~18~~

SI & CI :-

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

Amount = Pt Interest

$P = 3000$

$N \rightarrow 4$ yrs

$R \rightarrow 15\%$

$S\text{-}I = \frac{3000 \times 4 \times 15}{100}$

$= 1800$

S-I:

In S-I the basic principle remains constant therefore every we get the same interest

C-CAT problem:-

P = 4000
R = 20%.
N = 4
3200

C-CAT problem

Using S-I A bank offers 3 different interest rates 9%., 10%. 71%. for the first & second & third year respectively on principal of 5000 Rs find total SI →

5000
1%.- 50%
9%.- ~~450~~ 450
10%. 500
~~71~~ 11%.- 3550

S-I = 3550
450
500
450

30%. of 5000 = 1500

Step: Add all percentage
find net percentages
find percent of Base.

Compound interest →

$$\text{Amount} = P \times (1 + R/100)^N$$

$$CI = A - P.$$

$P = 2000$
$R = 10\%$.
$N = 2$ yrs

find Amount & CI

$$2000\left[1 + \frac{10}{100}\right]^2$$

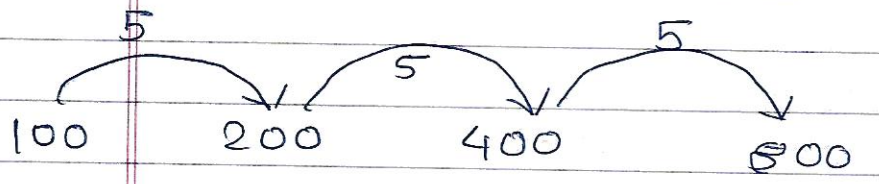
$CI = 420$ Rs/-

In CI the principal keeps on increasing we get interest on interest

2000 → 2200 → 2420

420

Using C-I the principal doubles 5 doubles after how many years becomes 1) 4 times of itself
2) 8 times of itself



ANS 1] 10 yrs
2] 15 yrs.

Problem :→
The SI and CI for two years on a certain principal R 100Rs & 104Rs respectively find ROI?

SI	CI
50	50
50	54
100	104

A Batsemen in 17th inning - 85 Runs and thereby increase batting avg by 3 find new avg.

$85 = 0 \cdot A + (17)3$

$85 - 51 = 0 \cdot A$

$34 = 0 \cdot A$

New Avg = 37

★ H·CF

1657 2037

380

difference - 380

factors = 2, 5, 19

H·C·F = 1 :- because they are coprime

STEP I : DIFFERENCE

II : FACTORS

III : CHECK DIVISIBILITY BY FACTORS

IV : HCF = 1

classmate
Date
Page

PROFIT & LOSS:

1] CP = 80Rs/-
SP = 100Rs

Profit %

$\frac{20}{80} \times 100 = 25\%$

2] CP = 500
profit = 30%.
650

3] SP = 720
profit 20%.
find CP

$\frac{20}{100} x = 720$

$2x = 720$

$\boxed{x = 360}$

4] Indra purchases two DVD purchases for Rs 300 each HD. He sells first DVD at 20% profit and second one at 200% loss or net profit loss %.

5] Nishant sells two DVD for 300Rs each one of the first he makes a profit of 20% on second suffers a loss of 20%. find net profit or loss %

NOTE ✱✱✱

If the profit & loss percentage is same - say x, then no:-1) if CP is same no profit no loss if no:-> 2) S.P is same is always a loss of $\left[\frac{x}{10}\right]^2$ %.

✱ A Book seller sells fourty books at the cost of 50 books. find his net profit or loss %.

Let CP of 1 book → 1 Rupees

cost of 50 book → 50 Rupees

∴ 40 → 50

$\frac{40}{50} \times 100 = 80\%$

$P\% = \frac{10}{40} \times 100$

$P\% = 25\%$

* A fruit seller sells apples at CP, but use a weight of 800gms - 1kg. Find P%?

~~CP = 1kg - 1R~~
~~= 80%~~

$P\% = \frac{\text{Error}}{\text{Actual wt sold}} \times 100$

$P\% = \frac{200}{800} \times 100 = 25\%$

* Logic

CP = 80
SP = 100

* Discounts :-

100 80
20%

100 90 81
10% 10%

What single discounts is equal to two successive discounts of 20% and 10%.

A fruit vendor sells grapes 12% profit further weight 800gms 1kgs. profit %?

1000 gms - 100
800 gms - 80

1kg = 1000 1000
80 - 112
1 ?
32/80 x100

SP = 112 - 80
= 32

Profit % 32/80 x100

= 40%

✱ TOPIC WORK & TIME.

✱ A takes 20 while B takes 80 days to finish a job. They start working together after how many days should A leave the job so that total work should be completed in 21 days?

$$\frac{21}{30} + \frac{x}{20} = 1$$

$$\frac{420 + 3x}{60} = 1$$

$$42 + 3x = 60$$

$$3x = 18$$

$$\boxed{x = 6}$$

✱ SHORTCUT METHOD

STEP-I] FIND L.C.M

STEP-II] find speeds : $\frac{LCM}{A}$ & $\frac{LCM}{B}$

STEP-III] Observe Ex' -

L.C.M - 60

Speed : $\frac{LCM}{A} = A : 3$

$\frac{LCM}{B} = B : 2$

Now; 3 X ( ) 18

2 X 21 : 42

ANS: -6

Ex: A days - 30
B days - 40

L.C.M = 120

Speed A: 4X30 12
B: 3X36 = 108

they start working together after how many day should A leave the job so that the total work is completed 36 days - ?

Ans: A = 3 days

Ex: A, B, C →
12 15 20

L.C.M: ~~24, 36, 48~~, 60

A = 5

B = 4

C = 3

Q.1) In how many days will be work done if together :
Ans: 5 days

Q.2) A, B, C worked together 2 days. ? Now C leaves the job how many days will A & B finish the remaining work :- 6 days

Q.3) A works alone for 2 days B work alone 8 days A+B = 42 ? In how many days ~~we~~ will C finish the remaining work ? 6 days

*** Problem A is twice as efficient as B. He works 10 days less than B. In how many days B finish it alone ?

Common Sense

B = 20 days

* Topic — Pipes & tanks :→

Que1] An inlet pipe can fill tank in 30 hrs while an outlet pipe in 50 hrs in how many hrs will the tank be full if two pipes work together ?

Step I find L.C.M

150

I → A: 5

B: -3

Hence 2 litres / 1 hr

→ 75 hrs

* two inlet pipes A and B can fill a tank in 8 hrs and 12 hrs respectively while an outlet pipe C can empty tank in 6 hrs

8, 16, 24

LCM: 24

A: 3

B 02

C: -4

1 litre/1 hr

Q.1) In how many hrs will tank be full - 24 hrs.

Q.2) at 12 noon only pipe A is open at 3pm, pipe B is open at 5 pipe C open.
at what tim tank will be full

12 - 3 : A : 9 litres
3-5 : 6 litre + 4 litre
total : 19 litre

after 5 : 1 litre at 1hrs.

ANS: 10 pm

Ex: ₹ three men & four boy

(3M + 4B) → 7 days
(11M + 13B) → 8 days

(3M + 4B) 7 = 756
(11M + 13B) 8 = 3008

classmate
Date
Page

SPEED TIME DISTANCE

$D = S \times T$

$S = D/T$

$T = D/S$

1 km/hr : (5/18) m/sec

Trains ??

How much time 300m long train take to cross electricity board if speed of train is 36 km/hr

Time $= \frac{300}{10} = 30$ seconds

How much time will Raidu express take to cross a bridge of length of 400m?

Ans → length = 400m + 300m

700m = 70 seconds

Q → How much will Raidu express will take to cross another of length 1500 18 km/hr in

1) Same

2) opp direction.

NOTE:- whenever we see 2 moving objects we will assume that the slower object is stationery and use the concept of

Relative speed = $x-y$, same
$x+y$, opp.

same $\frac{450}{5}$ = 90 seconds

opp: $\frac{450}{15}$ = 30 seconds.

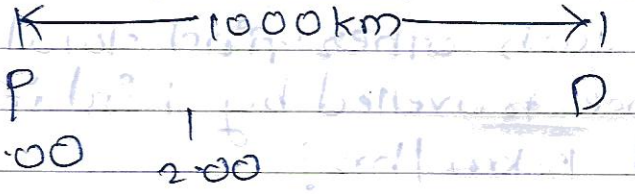
1) TYPICAL APTITUDE:→

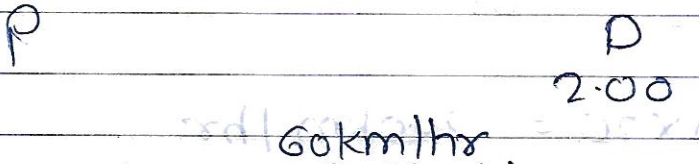
How much time will raidu express take to cross anand sitting in another of length train (200m) running at (8km)/hr in opp dirn?

$\frac{300}{15}$

= 20

★ Pune express leaves pune for Delhi at 12.00 noon at 60km/hr at 2.00pm Delhi express leaves Delhi at 50km/hr if dist betn pune & delhi is 1000km at exact time cross each other





1000km = 60 X time

120 km hr dist in 2 hrs

∴ 880km : distance :-

∴ Hence time = $\frac{\text{dist}}{\text{speed}}$

time = $\frac{880}{110 \text{ km/hr}}$

time 8 hrs

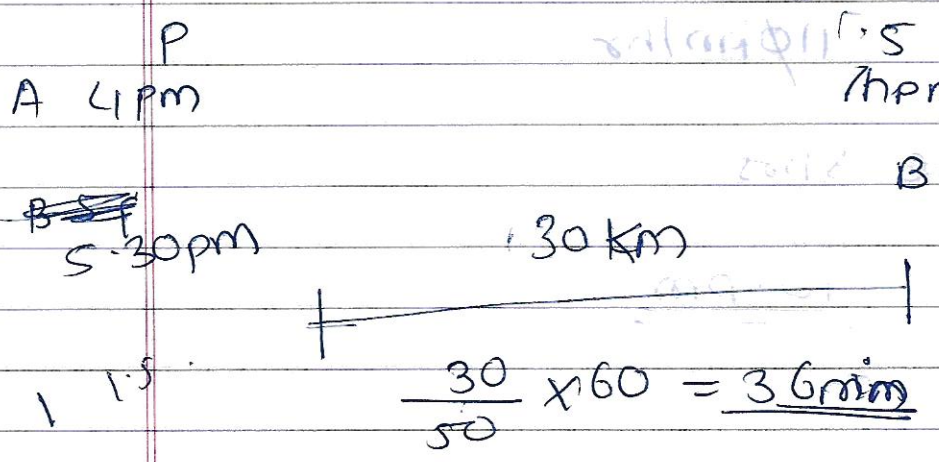
10.pm

Deepali & sayali are walking towards each other on 100 km long road. speed 3 hrs & 2 km respective at the same bird off had of deepali start flying towards sayali touches sayali flyes back to depali and so on. till two friends meet each other. find total distance travelled by bird if speed of bird 12 km/hrs?

$$\frac{100}{3+2} = 20 \text{ hr}$$

$$12 \times 20 = 240 \text{ km/hr}$$

A train 'A' leaves pune 4pm & reaches Lonavala 5pm at 4pm B ~~se~~ leaves lonavala & reaches pune 5.30 pm What tim will meet each other.



$$\frac{30}{50} \times 60 = 36 \text{ min}$$

x : BOAT
Y : RIVER

* Chinar Rows to a place 60km away and comes back, find total time taken if speed of boat and the river are 10 & 5 km/hr

$$\text{Time} = \frac{\text{distance}}{\text{speed}}$$

$$\text{Time} = \frac{120\text{km}}{10+5} + \frac{120}{5}$$

$$= \frac{4\cancel{120}}{\cancel{15}_1} + \frac{\cancel{120}^{24}}{\cancel{5}_1}$$

$$= 8 + 24$$

$$= 32\text{hr} / 2$$

$$= 16\text{hr}$$

* Sridhar Rows to place to 35km away & comes back in 12hrs. find speed of boat if rivers is 1km?

$$\frac{35}{x+1} + \frac{35}{(x-1)} = 12$$

factors of 35 = 7 × 5

Ans = 6

* Prithviraj rows to a place 55km away & comes back taking a total of 16 hrs. find the speed of boat if the speed of river is 3km/hr.

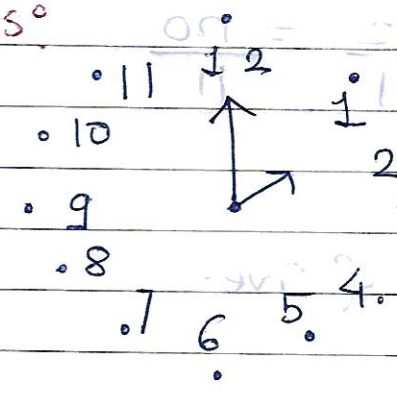
$$\frac{55}{x+3} + \frac{55}{x-3} = 16$$

11.5

$$x = 8$$

NOTE: If ratio of the time taken is A : B then the ratio of speed is B : A.

Clocks



- clock = 60 minute space
- Speed hr hand ⟶ 60 minute spaces/hr / min

Hr ⟶ 5m·s/hr

$\frac{1}{12}$ m·s/min

Relative speed = $1-\frac{1}{12} = \frac{11}{12}$ m s/min

The two hands co-incide 11 times in 12hr period that is 22 times a day

The two-hands are in opposite dirn 11 times in 12hrs period ie 22 times a day.

The two-hands makes 22 right-angles 12hr period i.e 44 right-angles day.?

At what exact time betn 2 & 3 will the two-hands co-incide?

$T = \frac{10}{11/12} = \frac{10 \times 12}{11} = \frac{120}{11}$

Betn four & five.

$5 \times 4 + 30$

$\frac{50 \times 12}{11} = \frac{600}{11}$

Que → Betn 3 & 4 will two hands in opp dirn

$$\frac{45 \times 12}{11}$$

Q- find the angle at 8:30 . The angle betn two hands at time H:M

$30H - 5.5M = \text{angle}$

$30(8) - 5.5(30) =$

$240 - 165 = 75°$

7:20

$30(7) - 5.5(20$

$210 - 110$

$= 100°$

CALENDAR:

7 : 20

$30(7) - 5.5(20)$

$210 - 100 + 10$

$210 - 110$

100.

(3) 4:30

$30(4) - 5.5(30)$

$120 - 165 = -45° = 45°$

Calendars:

(1) lipyear: 365 days 5hrs 49 min
centuries → divisible 400
noncenturies → divisible 4
Non lipyear: 365 days :-

lipyear.

Je disel / 7

365 / 7

odd day.

a Non lip-year have one day.

History test

While lip year has 2 odd days.

6th June 2014 - Friday
find day on
6th June 2034

16, 20, 24, 28, 32. - 5 lip years
15 Non Lep years.

5 LY X '2' = 10 ; 10/7 : R = 3
15 NLY X '1' = 15/7 : R = 1
odd day

= 3 + 1 = 4

Ans:- 6th June 2034 - Tuesday.

15th Aug 1947 :- Friday :
15th Aug 1927

44, 40, 36, 32, 28

5 LY X 2 = 10 / 7 R = 3
15 X 1 = 15/7 : R = 1

3 + 1 = 4

∴ ANS = MONDAY

DATE :
PAGE NO.

29th October 1981 = Thursday

find ay on

29th october 2011 =

84, 88, 92, 96, 20, 204, 208, ~~212~~

7 X 2 = 14 / 7 : 0

23 X 1 = 23 / : 2

Saturday

LOGICAL REASONING

A] series Based prb
B] sitting arrangment
C] coding decoding
D) MISCELLANEOUS
E) BLOOD RELATIONSHIP.
f) SYMBOLS.

Page No.:
Date :

5

~~4 00 2 0 0 0~~

A] SERIES :→

A] 1 2, 3 4 5

B] 2 5, 8, 11, 14.

C] 2 9 28 65 126

D] TYPE I : DIFFERENCE
TYPE II : SQUARES & CUBES
TYPE III : Product + difference.

D] 100 99 98, 94 86, 77 50

E] 2, 5, 12, 27, 58

3^3

77

27

5 J

Page No.:
Date :

TYPE IV : FIBONACCI SERIES:

3 6 9 15 24 39 = 63

3 3 .

1 2 3 6 11 20 37.

32 5 29 9 26 13 23.

TYPE : COMBINATION of TWO or MORE SERIES.

HTT VAriety:

5 7 11 19 35 ..

Type 6 difference. GP.

TYPE 7 :- Kuch bhi Hota sakta hai

77 49 36, 18, 8

72
18
54

1	2	3	4	5	6	7	8	9	10
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30							
11	22	33	44	55	66	77	88	99	110
12	24	36	48	60	72	84	96	108	120
13	26	39	52	65	78	91	104	117	130
14	28	42	56	70	84	98	112	126	140
15									
16	32	48	64	80	96	112	128	144	160
17	34	51	68	85	102	1189	135	152	170
18	36	54	72	90	108	126	144	162	180
19	38	57	76	95	114	133	152	171	190

Squares:

6 - 36	11 - 121	16 - 256	21 - 441
7 - 49	12 - 144	17 - 289	22 - 484
8 - 64	13 - 169	18 - 324	23 - 529
9 - 81	14 - 196	19 - 361	24 - 576
10 - 100	15 - 225	20 - 400	25 - 625

Prime no - from 100 - 200 [21]

101, 103 107 113 127 131 137 139
149 151 157 163 167 173 179
181 191 193 197 199.