GENERAL ABILITY (30 - 34 Q)

Test of Reasoning:- (20 M)

Verbal test of Reasoning :-

1. Number
2. Time sequence
3. Ranking and comparison
4. Blood relations
5. Arithmatical reasoning
6. Logical venn diagrams
7. Alphabetical test
8. Mathematical operations
9. Coding and Decoding
10. Inserting the missing character (Number series)
11. Alphabetic Qubal.
12. Direction and distances
13. Number, Time, sequence,

Non verbal test of Reasoning :-

1. Cubes and dices
2. Analytical figures

Computations:- (10 M)

1. Ratios and proportions
2. partnership
3. problems on Ages
4. Time and work
5. Types and cisterns
6. Averages
7. Time, distance and speed
8. Mixtures and Allegations
9. percentages
10. Profit and loss
11. Interest calculations
12. problems on clocks
13. Calenders
14. Data Interpretation

Left ⟹ ⟹ (L) to (R) Right

From left = To Right = Towards Right

From your left = To your Right = Towards your Right.

(L) ⟸ ⟸ (R)

(L)

From Right = To left = Towards left

From your Right = To your left = Towards your left

Alphabetical Qubble :-

Qubble means "play with"

(L) A B C D E F G H I J K L M (R)

(first half) 1 2 3 4 5 6 7 8 9 10 11 12 13

N O P Q R S T U V W X Y Z

14 15 16 17 18 19 20 21 22 23 24 25 26

(second half)

G T_{20} = Twenty

F = 6 ↳ Fix = six

Ex:- Which letter will be fourth to the Right of 12th position from your left end of the english alphabet.

Ans) 'P'. $\underset{4R}{\text{to}} + \underset{12L}{\text{from}} = 16L$

Ex:- Which letter will be fifth to the left of 9th letter from your right end of the english alphabet.

A) $\underset{5L}{\text{to}} + \underset{9R}{\text{from}} = 14R$ 'M'.

Ex:- Which letter will be sixth to the left of 20th position from your left hand of English alphabet.

Ans) $\underset{6L}{\text{to}} - \underset{20L}{\text{from}} = 14L$ 'N'

Ex:-) Which letter will be 5th to the right of 20th positio from your right end of the English alphabet. (2)

A) To — from

5R − 20R = 15R — 'L'

Note:-

1. Like in above type of problems if in to and from positio

a. If both are same directions (subtract them) (−)

b. If both are different directions (Add them) (+)

To		From
L	+	R
R	+	L

Ex:- Which letter will be 12th to the left of 30th position from your left end of the english alphabet.

A) To — From

12L − 30L = 18L — "R"

Type - II questions:-

Ex:- If in the english alphabet interchange 'A' takes the 'Z' and 'Z' takes place of 'A', 'B' takes 'Y', 'Y' takes 'B' which letter will be 6th to the right of 10th position from your left end.

Ans:-) to — from

6R + 10L = 16L — "P"

Ex:-) If in the english alphabets interchange their positions i.e.) 'A' takes place of 'Z', 'Z' takes 'A', 'B' takes 'Y', 'Y' take of 'B' and so on. Which letter will be 5th to the right of 12th position from your left end.

Ans) to — from — "J" — so on, (given so alphabets interch

Note:-

Like in above type of problems if total alphabets written in reverse order then obtain direction is reverse i.e.,

$L \longrightarrow R, \quad R \longrightarrow L$

Ex:- In above problem which letter will be 6th to the right of 22nd position from your right end.

Ans:-) to from

$6R - 22R = 16R \longrightarrow 16L \Rightarrow$ 'P'

Type - III Questions:-

Ex:- If in the english alphabets interchange their position i.e., 'A' takes 'B', 'B' takes 'A', 'C' takes 'D', 'D' takes 'C' and so on.... which letter will be 6th to the right of 11th letter from your left end.

A) (L) B A D C F E H G J I L K N

M P O R Q T S V U X W Z Y (R)

to from

$6R + 11L = 17L$ "R"

(or)

$6R + 11L = 17L$ (add + 1) $\Rightarrow$ $17L + 1 = 18L$ (original alphabet)

(add) $\Rightarrow$ "R"

Note:-

Like in above type of problems if adjacent (or) interchange their positions then apply odd even principle.

odd = +1

even = -1

Ex:-) In above problem which letter will be 5th to the right of 25th position from your right end.

Ans) To — From

5R − 25R = 20R (even then subtract '1')

= 20R − 1 ⇒ 19R ⇒ "H"

Ex:-) If in the english alphabets all adjacent positions ~~are~~ or interchange their places and also total sequence is written in reverse order then which letter will be 6th to the left of 13th position from your right end.

Ans) To — from

6L + 13R = 19R (odd then add '1')

= 19R + 1 ⇒ 20 (R) (Total) ⇒ 20L ⇒ "T"

(1 adjacent)

Ex:-) In above problem which letter will be 4th to the right of 14th position from your ~~left~~ end.

A) To — from

4R + 14L ⇒ 18L (even, so subtract)

⇒ 18L − 1 ⇒ 17 (L)

⇒ 17R ⇒ "J"

Ex:-) If in the english alphabets first half of the alphabets are written in reverse order, which letter will be 5th to the ~~left~~ of 13th position from your right end.

A) To — From

5L + 13R ⇒ 18R "E"

(L)	1	2	3	4	5	6	7	8	9	10	11	12	13	(R)
	M	L	K	J	I	H	G	F	E	D	C	B	A	
	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	
	14	15	16	17	18	19	20	21	22	23	24	25	26	

Ex:- Which letter will be midway b/w 6th position from left end and 11th from right end.

A) $\xrightarrow{6L}$ $\xleftarrow{11R}$ $\Rightarrow$ "K"

(GHIJ) K (LMNO)

Ex:- Which letter will be midway b/w 7th position from left end and 9th from right end.

A) $\xrightarrow{7L}$ $\xleftarrow{9R}$

H I J K L M N O P Q

$\Rightarrow$ No such letter is there.

Ex:- Which letter will be midway b/w 9th position from left end and 10th from right end.

A) $\xrightarrow{9L}$ $\xleftarrow{10R}$ (or)

(J K L) M (N O P)

$\Rightarrow$ "M"

Ex:- Which letter will be midway b/w 8th position from left and 12th from right

A) $\xrightarrow{8L}$ $\xleftarrow{12R}$

(I J K) (L M N)

$\Rightarrow$ No such letter

Note:-

1. Like it above type of problems if from either ends both are even (or) both are odd then there is no midway b/w them
2. If from either ends one is even and another one is odd then there is possibility for midway b/w them. Find that midway from either end $\wedge$ Subtract

from "26" and divide with '2' of remainder and rounded to next figure and add this fig to any position number and count from the way only. (4)

Ex:- $26 - 19 = \frac{7}{2} = 3.5 \cong (4)$ add this 4 to 26 $\Rightarrow$ 30 'L'

Type - II Questions:-

Ex:- Study the following sequence carefully and answer the questions as follows.

(L) A 3 B Δ D 4 □ 6 N β 5 M 2 ★ E 8 (R) Total = 16

Ex:-) In above sequence which letters (or) numbers, symbols will be midway b/w 4th position from left end and 6th position right end.

A) $\xrightarrow{4}$ $\xleftarrow{6}$ $\Rightarrow 16 - 10 = 6$ $\Rightarrow$ D 4 □ 6 N β

No such no. exist

Ex:-) In above sequence which letter (or) number (or) symbol midway b/w 3rd to left and 6th to Right.

A) $\xrightarrow{3L}$ $\xleftarrow{6R}$ $\Rightarrow 3+6=9$

Δ D 4 □ 6 N β

$16 - 9 = \frac{7}{2} = 3.5 \cong (4)$

$4 + 3 = 7L \Rightarrow$ □

Ex:-) In above sequence which letter (or) number (or) symbol will be 4th to right of 5th position from left end.

A) To From

4 □ 6 N β 5 M

$4R + 5L \Rightarrow 9L \Rightarrow$ 'N'

Ex:-) In above sequence all adjacent positions are interchange then which letter or number or symbol will be 5th to the left of 16th position from your left end.

A) To From

$5L - 16L$ (interchange)

$\Rightarrow 11L \Rightarrow 11L + 1 \Rightarrow 12L$

"M"

Ex:-) In above sequence all adjacent positions are interchange their places and also total sequence is written in reverse order then which letter, symbol, number will be 4th to the left and 7th from Right

A) To / From \

4L + 7R = 11R

11R+1 = 12(R) ⇒ 12L ⇒ "M"

Ex:-) In above sequence which letter will be 4th to the right of 5th position from left end. If that position is a symbol, immediately a precided of that. If the position is a numbered immediately followed letter is your answer.

A) To / From \

4R + 5L ⇒ 9L ⇒ "N".

Ex:-) In above sequence letters are coded as FEMALES, numbers are coded as "MALES", symbols are coded as "CHILDRENS". How many ~~children~~ males are there. we are having either side females.

A)

F	M	F
↓	↓	↓
L	N	L

Ex:-) In above sequence according to their positions of the ratio b/w symbols to letters.

A)

S		L
=		=
4	:	6
2	:	3

DIRECTION AND DISTANCES

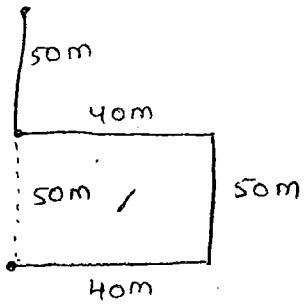
1. A man moves towards east and covers a distance of 40m the turns north and covers a distance of 50m. they turns west and covers a distance of 40m, they turns north, and covers 50m how far is he starting position.

A) 100 m

(or)

E_{40} N_{50} W_{40} N_{50}

add $50 + 50 = 100$ m



(Different directions subtract, same direction add)

Note :-

Like in above type of problems if only one person covers the distance, in same direction add them. Eg:- E+E+E+ - - - - W+W+W+ - - - - S+S+S+ - - - - N+N+N+ - - - -

In opposite direction subtract them. Eg:- E−W, W−E, S−N, N−S

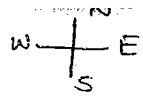
2. A women moves towards north and covers a distance of 50m then turns east and covers 80m then turn south and covers 50m then turns west and covers 30m. How far is she from at reached position.

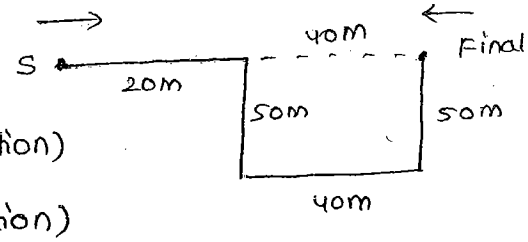
A) N_{50} E_{80} S_{50} W_{30} $\quad 50 - 50 = 0$

$\Rightarrow 80 - 30 = 50$ m (different direction)

3. Raju moves towards east and covers a distance of 20m then turn south and covers a distance of 50m then turns east and covers a distance of 40m then turns north and covers a distance of 50m. How far and which direction is he from his starting position.

A) E_{20} S_{50} E_{40} N_{50} $\Rightarrow 20 + 40 = 60$ East





$\Rightarrow$ 20+40

$\Rightarrow$ 60m East (starting position)

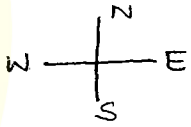
$\Rightarrow$ 60m west (Final position)

Note:-

1. If directions asked from starting position (or) initial (or) original position then your direction is obtain ~~it~~ one only.
2. If direction asked from final position (or) end (or) reached position, then your direction is opposite of obtain one.

3. A rangeela drive towards south and covers a distance of 20 km then turns east and covers 50 km then turn south and covers 30 km then turns west and covers 50 km they turn south covers 40 km. How far and in which direction is she from a reached position.

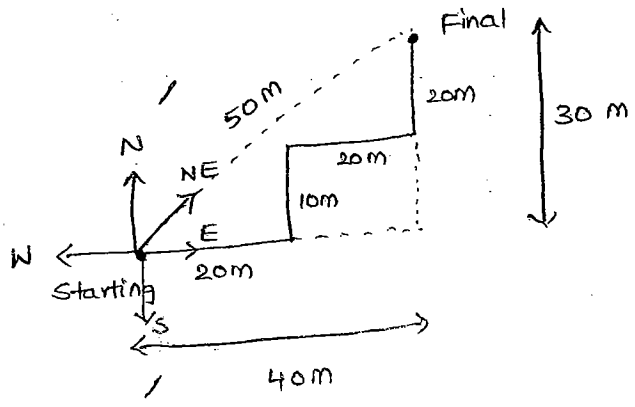
A) S_{20} E_{50} S_{30} W_{50} S_{40}



$\Rightarrow$ 20+30+40 = 90 km North.

4. Arun moves towards east and covers a distance of 20m then turns north and covers a distance of 10m then turns east and covers 20m then turns north and covers 20m. How far and in which direction is he from his initial position.

A)



$\Rightarrow$ 50m NE

(or)

E_{20} N_{10} E_{20} N_{20}

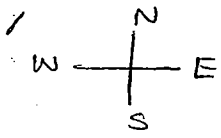
E_{40} N_{30} $\Rightarrow \sqrt{40^2+30^2} = 50$

$\Rightarrow$ 50m NE

5. Suri moves towards east and covers a distance of 30m then turns left and covers 20m, then turns left and covers 30m, then turns right and covers 20m. How far and in which direction is he from his original position.

A) L L R

E_{30} N_{20} W_{30} N_{20}



$\Rightarrow 20 + 20 = 40$ m North (starting position)

6. Kranti moves towards north and covers a distance of 40m then turns right and covers a distance of 50m then turns left and covers 20m, then turns left again and covers 50m. How far and in which direction is he from his reached position.

A) R L L

N_{40} E_{50} N_{20} W_{50}

$\Rightarrow 40 + 20 = 60$ m S (Reached position)

7. Dayana drive towards east and covers 30 km, then turns left and covers 50 km, then turns left and covers 30 km, then turns left and covers 50 km, then turns right and covers 40 km and died. How far and in which direction is she from a death position.

A) L L L R

E_{30} N_{50} 30 50 40

E_{30} N_{50} W_{30} S_{50} W_{40}

$\Rightarrow$ 40 km East (reached position)

NOTE:-

- Like in above type of problems

1. If starts from any one 'x' position, both are same positions Left - Left (or) Right - Right the next direction is opposite of

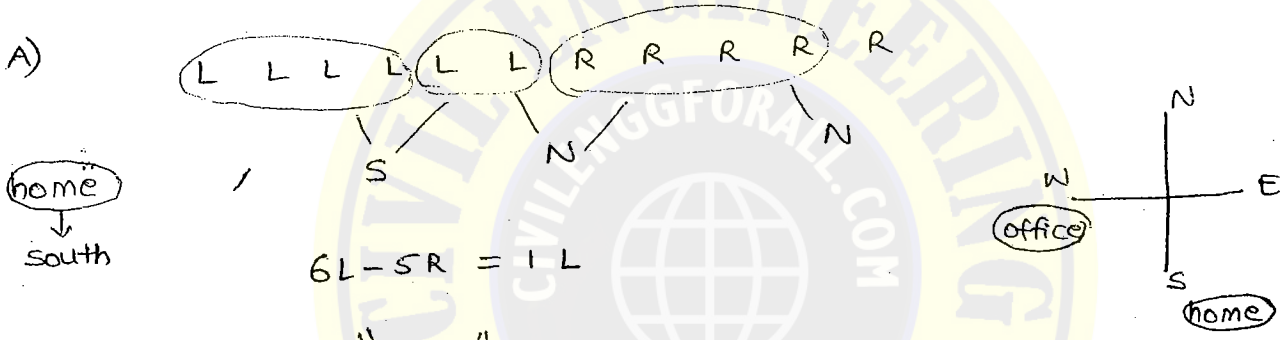
2. If starts from any one x-direction, both are different terms Left - Right (or) Right - left, the next direction is same as x-direction.

$$x' \rightarrow \left\{ \begin{matrix} L-R \\ (or) \\ R-L \end{matrix} \right\} \text{ same as } x\text{-direction.}$$

$$x \rightarrow \left\{ \begin{matrix} L-L \\ or \\ R-R \end{matrix} \right\} \text{ opposite of } x\text{-direction.}$$

8. Amar moves to office from his home, he reaches in office after 6 left turns and 5 right turns. If is home is in south then in which direction is his office.

A)



$$6L - 5R = 1L$$

office in "west"

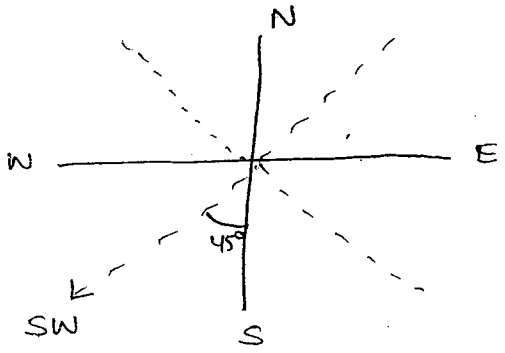
Note:-

$$x' \rightarrow \left\{ \begin{matrix} L-L-L-L \\ (or) \\ R-R-R-R \end{matrix} \right\} \text{ same as } x\text{-direction.}$$

1. Right hand turn is clock wise direction.
2. Left hand turn is Anticlock wise direction.

9. Iam facing towards south then turns clockwise with an angle of 45° then turns anticlockwise with an angle of 90° they turn clockwise with an angle of 135°, they turn anti c.w with 90°, they turn clock wise with 45°. In which direction Iam facing now.

A. C_{45° A_{90° C_{135° A_{90° C_{45°



Add all clockwise

C_{275°

Add all Anticlockwise

A_{180°

$\Rightarrow C_{275} - A_{180} = 45^\circ$

$\Rightarrow C_{45^\circ}$

$\Rightarrow$ SW

10. Gajini facing towards North east then turns clockwise with an angle of 20° they turns anti clockwise with an angle of 35° they turns clockwise with 30°, they turns anticlockwise with 55° then turns clockwise with 40°. In which direction he facing now.

A) Gajini facing NE

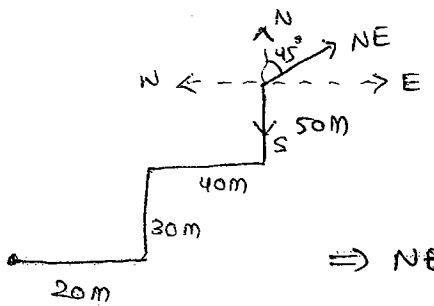
C_{20° A_{35° C_{30° A_{55° A C_{40°

$\Rightarrow C_{90^\circ}$ A_{90°

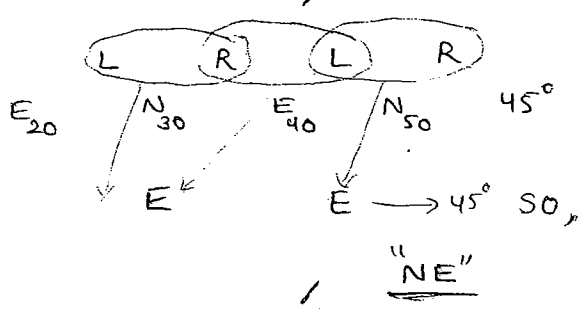
$\Rightarrow 90 - 90 = 0^\circ$ (same direction)

$\Rightarrow$ NE

11. Rajini moves towards east and covers 20m, they turns left 3e and covers 30 m, they turns right and covers 40m they turns left and covers 50m, they turns right with an angle of 45°. In which direction he facing now.



$\Rightarrow$ NE



"NE"

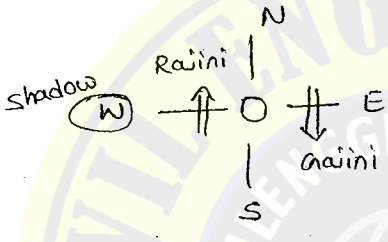
Note:-

1. In morning hours after sunrise our shadow falls towards west direction.

2. In evening hours before sunset our shadow falls towards east direction.

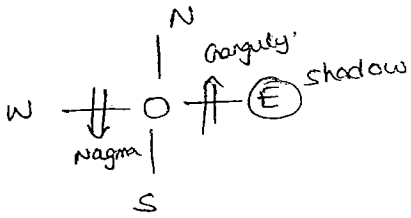
12. In one morning hours after sun raise Rajini and Gajini facing to each other and talk, at one cross roads in hyd the shadow of Rajini falls exactly to his left handside. which direction Gajini was facing now.

A. Gajini facing South



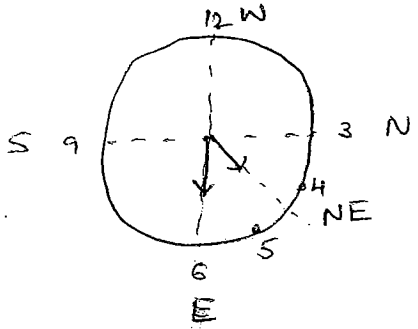
13. In one evening hours before sunsets Nagma and Ganguly are facing to each and talk to each other at one cross roads at Kolkata. the shadow of Nagma falls exactly to right of Ganguly. then it which direction Nagma was facing now.

A) Nagma facing south.



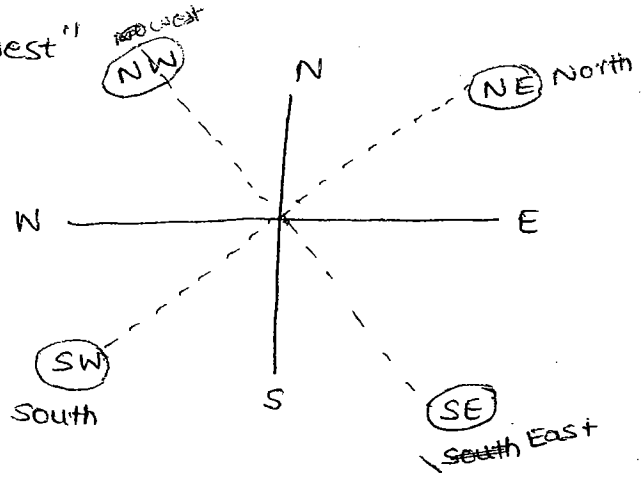
14. A watch reads 4:30 hrs, if minutes hand points towards east then in which direction hours and points now.

A) "NE"



15. If south East is called East, North west is called west, SW is called South and so on. Then what /be North called

A) "North west"



NUMBER, TIME SEQUENCE, RANKING AND COMPARISION :-(4-8

preceeded → previous → Before

preceeded by 4 is 3 → 34

Followed → After → Next

1. How many times 1, 2, 3 are come consequently in which 1 being in the middle and 2 and 3 are either sides of 1.

A. 1 2 3 1 2 2 1 3 3 1 1 2 1 3 1 2 2 1 3 3 1 1 2 2 3 3 4 1 2 3 1 2 3

2 1 3

3 1 2

Ans:- 6 times

2. How many even digits are there in the following sequence which are immediately preceeded to even digit products is equal to 1 even number?

A. 4 2 3 4 4 5 4 3 6 4 9 6 7 3 5 4 9 6 7 8 6 4 9 6 7 3 5 4 9 6 2 7 3 4 9 6

(exe) e (oxo)

e e o

e-even

O-Odd

Ans:- cannot be determined.

3. In above sequence how many even no's of are there which are immediately proceeded by two even digit products is subtracting from followed by odd digit product is equal to an odd number.

A) (e-3), 0-2

None.

4. In the following series how many such odd no. are there which are divisible by 3 or by 5, then followed by odd no.s and then also followed by even no's.

a) Nil b) 1 c) 2 d) three

A) 12, 19, 21, (3, 25, 18) 35, 20, 22, (21, 45, 46,) 47, 48, 9, 50, 52, 54, 55, 56

Odd no. Odd even = O O e

(Divisible by 3 or 5)

5. How many numbers are there from 1 to 150 which are exactly by 7 but not by 3.

a) 4 b) 5 c) 6 d) 7

A) 7, 14, (21,) 28, 35, (42) 49

Ans:- 5 NO's

Shortcut :- applicable by for only prime no's i.e., (7, 3) both are prime numbers.

$$\frac{50}{7} = \frac{7^{2}5}{3}$$

$(7-2) = 5$

6. How many no. are there from 1 to 50 which are exactly by 7 and also divisible by 3.

A) 7, 14, (21) 28, 35, (42) 49

Ans:- 2 NO's

7. How many no. are there from 1 to 700 (i) which are exactly by 7 but not by 3 (ii) which are exactly divisible by 7 but also by 3.

A) (i) $\frac{700}{7} = \frac{100}{3} = (100 - 33) = 67$ No's

(ii) $\frac{700}{7} =$

8. How many no's are there from 1 to 81 which are exactly divisible by 9 not by 3.

Ans:- zero

9. How many no's are there from 1 to 81 which are exactly divisible by '3' not by 9

Ans:- 3 6 (9) 12 15 (18) 21 24 (27) 30 33 (36) 39 42 (45)
48 51 (54) 57 60 (63) 66 69 (72) 75 78 (81)

Total 18 No's

Shortcut:-

1 to 81 by 3 = $\frac{81}{3} = 27$

1 to 81 by 9 = $\frac{81}{9} = 9$ (-)

18

Note:-

Like in above type of problems if any one is square of another, first divisible with big no. then not divisible with small no. possibility is not present. First divisible with small no. then not divisible with big no's possibility present. Find such possibilities as follows.

10. How many no's are there from 1 to 4000 (i) which are divisible by 4 but not by 2 (ii) which divisible by 2 but not by 4.

A) i) zero

ii) $\frac{4000}{2} = 2000$

$\frac{4000}{4} = 1000$ (-)

1000 = Ans 1000 No's.

11. The numbers from 1 to 85 by which are exactly divisible by 5 are arranged from ascending order from top. then which no. will be 11th position from top.

A. 5 10 15 20 25 30 35 40 45 50 (55) 60 65 70 75 80 85

Shortcut:-

For ascending order from top @ $11 \times 5 = 55$

12. In above problems which no. will be is in 11 position from bottom.

A. $\frac{85}{5} = 17$, $(17-11) = 6+1 = 7 \times 5 = 35$

Note:-

1. If starts from small no. then required no. is gt equal to given number of position x Divisible number.
2. If starts from big number then required number is equal to (Total - Given position) x Divisible number.

13. In above problem which number will be is in 15th position from bottom.

A. $\frac{85}{5} = 17 \Rightarrow (17-15) = (2+1) \times 5 = 15$.

14. Mithun was counting down from 32. sumit was counting upwards the number starting from 1 and he was calling out only the odd no. and what common number will be calling out at same time and same speed.

a) 19 b) 21 c) 22 d) They will not call out the same no.

A) Mithun: 32, 31, 30, 29, 28, 27, 26, 25, 24, 23, 22, 21, 20, 19

Sumit: 1, 3, 5, 7, 11, 13, 15, 17, 19, 21, 23

15. If 1st and 2nd digits in the sequence 5 9 8 1 3 2 7 4 3 8 are interchanged and also 3rd and 4th digits, 5th & 6th digits and so on, which digits will be 7th counting to your left.

A) shortcut :-

7^{th} from right

For odd no. add 1

7+1 = 8 from right

5 9 (8) 1 3 2 7 4 38

⇒ 8

16. If the position of the 1^{st} and 6^{th} digits of sequence of 8903214675 are interchanged 2 and 7 and so on which no. would be 7^{th} from right end.

a) 2 b) 6 c) 7 d) 8

A)

8	9	0	3	2	1	4	6	7	5
1	2	3	4	5	6	7	8	9	10

1 - 6
2 - 7
3 - 8
4 - 9
5 - 10

7^{th} from right end = 3 it interchanges from 4 to 9 then 9^{th} letter = 7

17. The letters L, M, N, O, P, Q, R, S, T in their order are substitute by 9 integers 1 to 9 but not in that order. 4 is ascend t P. The difference b/w P & T is "5". The difference b/w N & T is 3. what is integer ascend to N.

a) 4 b) 5 c) 6 d) 7

A) L to T = 1 to 9 (not in that order)

(i) P = 4 ; (P ~ T) = 5 i.e., $\left.\begin{matrix} P-T \\ T-P \end{matrix}\right\} = 5$

(ii) $\left.\begin{matrix} N-T \\ T-N \end{matrix}\right\} = 3$

a) P - T = 5 ⇒ 4 - T = 5 ⇒ T = -1 (It is not in 1 to 9)

b) T - P = 5 ⇒ T - 4 = 5 ⇒ T = 9 (OK)

c) N - 9 = 3 ⇒ N = 3 + 9 = 12 (X)

d) T - N = 3 ⇒ 9 - N = 3 ⇒ N = 6 (Ok)

18. 36 vehicles are parked in a parking ground in a single row. After first car there is 1 scooter, after second car there are 2 scooters. After 3 cars, 3 scooters and so on work out the how many scooters in the 2nd half of the row.

A)

1	2	3	4	5	6	7	8	9	10	11	12	13	14
C_1	S	C_2	S	S	C_3	S	S	S	C_4	S	S	S	S

15	16	17	18	19	20	21	22	23	24	25	26	27
C_5	S	S	S	S	S	C_6	S	S	S	S	S	S

28	29	30	31	32	33	34	35	36
C_7	S	S	S	S	S	S	S	C_8

Shortcut:-

C_1 1 C_2 2 C_3 3 C_4 4 C_5 5 C_6 6 C_7 7 C_8 — (18 − 3) = 15 No's

1 + 1 + 1 + 2 + 1 + 3 + 1 + 4 + 1 + 5 + 1 + 6 + 1 + 7 + 1 = 36

(18 − 3) = 15 No's scooters.

↓

3 cars in second half

19. In the following sequence of instructions 1 stands for run, 2 stands for stop and 3 stands for Go, 4 stands for sit, 5 stands for wait the sequence is continued, then which sequence is next.

4 4 5 4 5 3 4 5 3 1 4 5 3 1 2 4 5 4 5 3 4 5 3

a) wait b) sit c) Go d) Run

A) 4 | 45 | 453 | 4531 | 45312 | 45 | 453 | 4531. — is continued

Ans: 1 = run

RANKING TEST (1-2M)

1. In a row your position is 5th from either ends then how many members in the row?

A) 1 2 3 4 [5 / 5] 4 3 2 1

$10 - 1 = 9$

Only one person is counting twice so subtract '1'

2. Ramarao is 16th from top and 49th from bottom in a class. How many members are there in the class.

A.
$$\begin{array}{r} 16 \\ 49 \\ \hline 65 - 1 \end{array} = 64$$

3. Manisha ranked 16th from top and 29th bottom among those who passed an examination 6 boys did not participate in the competition and 5 failures in this. then how many members are in the class.

A)
$$\begin{array}{r} 16 \\ 29 \\ \hline 45 - 1 \end{array} = 44 \text{ - passed}$$

6 - Abstanties

5 - fails

55

4. In a row of 12 boys ramu who is 5th from left end then what is his position from right.

A. 1 2 3 4 5 6 7 8 9 10 11 12

$12 - 5 = 7 + 1 = 8^{th}$ from right.

5. Manoj and sachin are ranked 7th and 11th respectively from top in a class of 31 students. What will be the respective ranks from bottom.

A. $M - 7 \Rightarrow M_{24+1} = M_{25}$

$S - 11 \Rightarrow S_{(31-11)+1} = S_{21}$

6. In a row of 10 boys when rohit was shifted two places towards left, he become 7th from left end what was his position earlier from right end.

A. 1 2 3 4 5 6 (7) 8 9 10 ← left

2nd from right

7. In a row of girls shilpa is 8th from left and reena is 17th from right. If they interchange their position, shilpa becomes 14th from left. How many girls in the row.?

a) 25 b) 27 c) 29 d) None.

A. 1 2 3 4 5 6 7 S 8 9 10 11 12 13

16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

R_{17}
S_{14}

31 − 1 = 30

One place is counting two times so "-ve".

8. In a row of girls reeta and mounika occupies 9th place from right and 10th place from left end respectively. If they interchange their places reeta and mounika occupies 17th from right 18th from left. How many girls are their in the row.

a) 25 b) 26 c) 27 d) none of these.

A) M_{10} R_9 R_{17} M_{18}

27 − 1 = 26 27 − 1 = 26

9. In a que of children kilas is 5th from left and mona is 6th from right when they interchange their places among them kilas become 13th from left then what will be monas position from right.

a) 4 b) 8 c) 14 d) 15.

A. 1 2 3 4 K 5 6 7 8 9 10 11 12 M_6 5 4 3 2 1

M_{14} 13 12 11 10 9 8 7 K_{13}

K_5 8 M_6
M K_{13}

→ 6 + 8 = 14

Ans :- 14.

10. In a row of boys kapil is 8th from right Nikunj is 12th from left. When kapil and Nikunj interchange their position. Nikunj becomes 21st from left. Which of the kapil position from right.

a) 8 b) 17 c) 21 d) cannot.

N_{12} 9 K_8
K_{17} N_{21}

11. In a cube Amrutha is 10th from front while Mukul is 25th from behind and Mamata is just in middle of two. There will be 50 persons in cube. What position mamata occupies from front.

a) 20 b) 19 c) 18 d) 17

A) Total = 50

A_{10} —— M —— M_{u25}

50 − (10 + 25) = 50 − 35 = $\frac{15}{2}$ = 7.5 ≃ 8 from left and

10 + 8 = 18.

12. In a cube vijay is 14th from front and jack is 17th from end while mary is in b/w vijay and jack. If vijay be ahead of jack and there will be 48 persons in que. How many persons in b/w mary and vijay.

a) 8 b) 7 c) 6 d) 5

A) Total = 48 V_{14} —— M —— J_{17}

48 − (14 + 17)

= 48 − 31 = $\frac{17}{2}$ = 8.5 ≃ 9th person is mary

In b/w vijay and Mary = 8 No's.

13. three persons A, B, C are standing in a Q. There are 5 persons b/w A & B. 8 persons b/w B & C. If there be 3 persons ahead of C and 21 persons behind A. What could be the min no. of persons in the que.

a) 41 b) 40 c) 28 d) 27

A. $\overset{21}{\leftarrow} A \xrightarrow{5} B \xrightarrow{8} C \xrightarrow{3}$

$21+1+5+1+8+1+3 = 40$

ii) $\overset{3}{\leftarrow} C \xrightarrow{8} B \xrightarrow{15}$ A $\xrightarrow{21}$ $\xrightarrow{-6}$ II

$3+1+8+1+15 = 28$

ahead / behind

Ahead

(C) $\xrightarrow{3}$

$\leftarrow$ (C)

Behind

$\overset{21}{\leftarrow}$ (A)

(A) $\xrightarrow{21}$

18-10-14

TIME SEQUENCE

60 sec → 1 min → 60 min → 1 hr ; 24 hr → 1 day

7 days → 1 week, → 4 weeks → 1 month.

1. Kilas remembers that his brother deepak birthday after 20th may but before 28th May while geetha remembers that before 21st May but 12th May. on what date deepaks birth day falls.

a) 20th May b) 21st May c) 22nd May d) cannot.

Kilas > 20th may < 28th May (21) 22, 23

Geetha > 12th May < 22nd May 13, 14, 15, 16, 17, 18, (21)

⇒ 21st May.

2. Sangeeta remembers that her father's b^{th} day was after 8 but before 13^{th} of Dec. Her sister Natasa remembers that her fathers was definately after 9th but before on which date of Dec was there fathers b'day.

A) Sangeeta > 8^{th} < 13^{th} Dec

Natasa > 9^{th} < 14^{th} Dec

9 10 11 12

10 11 12 13

⇒ cannot be determined.

3. Varma leaves his house in 20 min to 7° clock in morning reaches vimala house in 25 min, they finished break fast in another 15 min and leave for their office it takes another 35 min at what to their leave urmila's house to reach their office.

A)

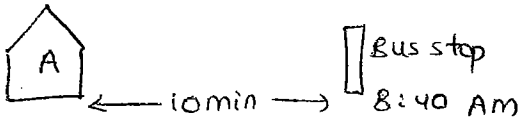
7:00 + 0:20 = 6:40

7:05 − 0:15 = 7:20 AM while leaving Urmilas house.

4. Ajay left home for bus stop 15 min earlier than usual. It takes 10 min to reach busstop. He reached the stop at 8:40 Am. What time does he usually leave for bus stop.

a) 8:30 b) 8:45 c) 8:55 d) None.

A)

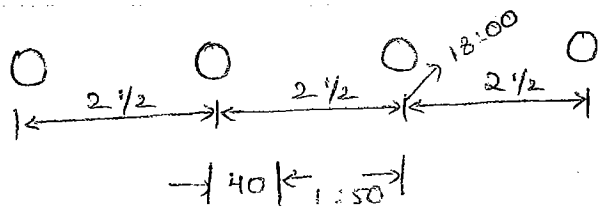


Today : 8:30

Earlier : 0:15 ⇒ 8:45 Am

5. The train for lucknow leaves every 2½ hrs from New Delhi Railway station. An announcement was made the train for lucknow had left 40 min ago. The train will leave at 18 hrs At what time was announcement made.

a) 15:20 b) 17:10 c) 16:00 d) none

A) 

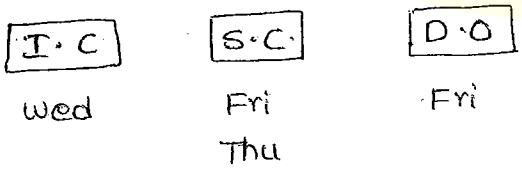
18:00
1:50
16:10 hrs

6. the managing director entered the conference room 20 min before 12 hrs he came 10 min before chairman who was 30 min late. At time the interviews were scheduled.

A) Managing Director = 12:00 − 20 min ⇒ 11:40
chairman = 11:50 AM (11:40 + 10 min)
scheduled Time = 11:50 − 30 min ⇒ 11:20 A.M.

7. An application was received by inward clerk in afternoon of a week day. Next day form warded it to the table of senior clerk. who was on leave that day. The senior clerk next day evening put up the application to the desk officer the desk officer studied it and disposed of matter on same day - i.e., friday which day was application received by the inward clerk.

a) Mon / b) Tue c) Wed d) None.

A) 

8. There are 20 people working in an office. the group of 5 persons 8am and 2 PM the 2nd group of 10 persons b/w 10 A.M and 4 P.M the 3rd group of 5 persons b/w 12 Noon and 6 P.M. there are 3 computers in office which all employes frequently used. During which of the following hours the computers are used to likely most.

a) 10 to 12 b) 12 to 2 P.M c) 1 P.M to 3 P.M d) 2 P.M to 4 P.M

A) (5)

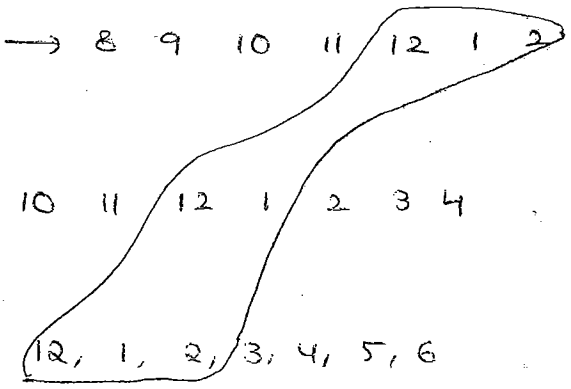
8:00 AM & 2 P.M → 8 9 10 11 12 1 2

(10)

10 AM & 4 PM → 10 11 12 1 2 3 4

(5)

12 NOON & 6 PM → 12, 1, 2, 3, 4, 5, 6



(16)

9. A monkey climbs 30 feet at the begining of each hour rests for a while when he slips back 20 feet before he again starts climbing in the begining of next hour. If it begining ascends at 8 A.M at what time will he first touch a flag @ 120 feet from ground.

a) 4 PM b) 5 PM c) 6 PM d) None.

Ans:-

1 hr = 30 feet ↑ + 20 ft ↓

= 10 feet

For last 30 ft it takes 1 hr time

Total = 9 hrs + 1 hr = 10 hours

8:00
10:00
18:00
12:00
6:00 PM

10. Mohini went to movie 9 days ago. she goes to movie only on friday. what day of week today.

a) Thursday b) Saturday c) Sunday d) Tuesday.

A)

1	2	3	4	5	6	7	8	9	10
Fri	sat	sun	Mon	Tue	Wed	Thu	Fri	Sat	sun

⇒ 9 days completed (Fri $\frac{9}{7}$ (1+2) = Sunday.

11. Chiru went to school 366 days ago. He goes to the school only on sunday. Then what the day on 2 days before of tomorrow's yesturday.

A)
-2 Before
$+1$ Tomorrow
-1 Yesturday
-2

$366 - 2 = 364$ $(52 + 0)$ same day
$=$ Sunday

12. Second dec was sunday. Then how many sunday's in month.

A)
2 — S
7
9 — S
7
16 — S
7
23 — S
7
30 — S

5 sundays

Shortcut:-

Total days = 31
2 — S
29 — 4S
7

— 5 sundays

13. In 3rd Jan was Monday on what date of the month 5th Monday falls.

A)
3 — M_1
7
10 — M_2
7
17 — M_3
7
24 — M_4
7
31 — M_5

Shortcut:-

3 — M_1
4 Mondays $= 4 \times 7 = 28$
31 — M_5

Difference between Leap year and Ordinary year

Ordinary year	Leap year
1. It is not divisible by '4'.	1. It is divisible by '4' except for centuries. For centuries it would be divisible by 400.
2. Feb = 28 days	2. Feb = 29 days
3. No. of days = 365	3. No. of days = 366
4. No. of odd days = $\frac{365}{7}$ = 52+1 (one)	4. No. of odd days = $\frac{366}{7}$ = 52+2 (Two)
5. First day of year and last day of year is same	5. Jan - 1st = n, Dec - 31st = n+1 day.

14. 3rd dec, 1990 is sunday, what day is 3rd Jan - 1991.

A. Upto 3rd January 1990

3rd Dec : 1990 — Sun → 28

3rd Jan : 1991 — ? → 3

31

$\frac{31}{7}$ = 3 odd days

Sunday + 3 = wednesday.

15. In 18th Feb 1997 is Tuesday, 18th Feb 1999 ?

A. 18 Feb 1997 — Tuesday

18 Feb 1999 — Thursday

1997] +1
1998] +1 = 2 days add
1999]

16. In 4th Jan 2001 is Sunday, 14th Jan 2002 ?

A. 4 Jan 2001 — Sunday

14 Jan 2002 — Thursday

] +1+10 = $\frac{11}{7}$ = 4 odd days.

17. If 8th Jan, 2008 was Monday, on 28th March 2009?

A. 8th Jan 2008 – Monday

8th Jan 2009 – (+2 days)

in Jan – 23rd day

Feb – 28

Mar – 28

$\Rightarrow \frac{81}{7} = 4$ odd days

Monday + 4 days = Friday.

18. How much will be there from 26th Jan 1996 to 15th May, 1996 (Both days included).

A. 26 Jan 1996 : 1 + 5

15 May 1996 :

Feb : 29

Mar : 31

April : 30

May : 15

$\Rightarrow$ 111 days

COMPARISONS

⇓		⇑
Small	Tall	
less	Big	
shorter	taller	
younger	elder	
	Richer	

1. A is taller than B, who is shorter than C.

A. C
A
B

2. Sachin is taller than kapil but shorter than Dhoni. Yuvraj is taller than pathan but shorter than kapil.

A. Dhoni
sachin
kapil
yuvraj
pathan

⇓ pathan is shorter.

3. Rahul is taller than Ranjan but shorter than Gunjan. Vijay and sharat are shorter than Gunjan. Vijay is shorter than Ranjan but taller than the one who is shortest amoung them. With decending order of the rights who is in 4th position.

A) Gunjan
Rahul
Ranjan
Vijay → 4th person.
Sharat

4. Lalu is taller than Balu but shorter than kalu. Malu is taller than valu but shorter than Ralu. Who is shortes amoung them

A. Kalu
1st statement Lalu
Balu
2nd statement Malu

⇓ cannot be determined

5. For solving above question which are the following statements are true.

A) Malu is taller than Lalu

B) Ralu is taller than Kalu

C) Malu is taller than Kalu

D) Valu is taller than Lalu

Ans:- (d),
Cannot be determined.

BLOOD RELATIONS

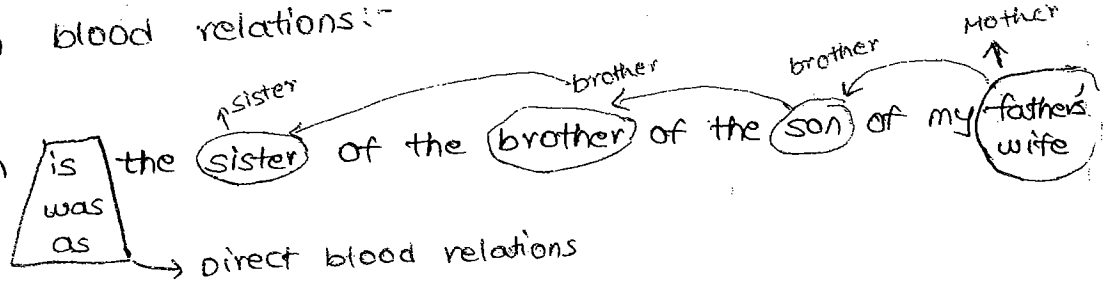
1. Father (or) Mother brother → Uncle — paternal uncle (father brother); Maternal uncle (mother brother)
2. Father (or) mother Sister → Aunt
3. Wife's (or) Husband's father → Father-in-law
4. Wife's (or) Husband's mother → Mother-in-law
5. Wife's (or) Husband's Brother → Brother-in-law
6. Wife's (or) Husband's sister → sister-in-law
7. Uncle's (or) Aunt's son (or) Daughter → Cousin
8. Brother's (or) sister's son → Nephew
9. Brother's (or) sister's daughter → Niece

Blood relations are three type:-

1. Single person blood relations
2. Mixed Blood relations
3. Coded Blood relations

Single person blood relations:-

Man to women



Ans:- Sister

2. Man → womens brother's sister's father is the father of the brother of the sister of the son of my father's wife

Ans:- Father

3. Anil introduces Rohit as the son of the only brother of his father's wife How is Rohit related to Anil.

Ans:- cousin.

4. pointing towards a person in a photograph, Anjali said he is the only son of father of my sister's brother How is that person related to Anjali.

Ans:- Brother.

5. pointing out a photograph a man tells his friend she is the daughter of the only son of my father's wife How is the girl in the photograph related to man.

Ans:- Daughter.

6. pointing to a man on the stage, Rita said he is the brother of the daughter of the wife of my husband How is the man on the stage related to rita.

Ans:- son

7. pointing to a man in a photograph a women said his brother's father is the only son of my grand father

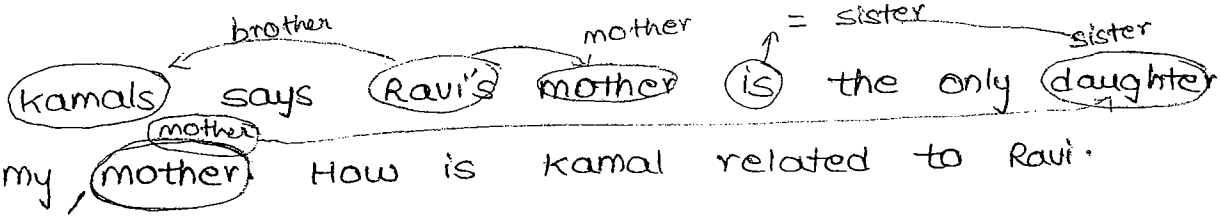
How is the woman related to man in the photograph.

Ans:- sister

Note:- Like in above type of problems if from either ends (Father = Father) or (Mother = Mother) or (Uncle = Uncle) or (Aunt = Aunt), if both are males their brother relations

between them. If both are females their sister relation between them. If one is male and other is female their brother & sister (or) sister and brother relation between them.

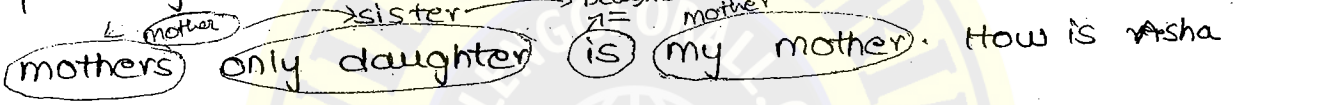
8. If Kamals says Ravi's mother is the only daughter of my mother, How is kamal related to Ravi.



Ans:- Brother

Note:- Like in above type of problems convert the relation in terms of asked person form then apply from opposite.

9. pointing to a man in a photograph, Asha said his mothers only daughter is my mother. How is Asha related to that man



Ans:- Niece

Mixed Blood relations :-

Male = '+'

female = '-'

⇔ couple

---> (Brother to Brother) or (Brother to sister) or (sister to sister) (or) (sister to Brother) or (father or mother) or (son or daughter)

* Read the following information carefully and answer the questions below given it. there are 6 persons A, B, C, D, E, F. C is the sister of F, B is the brother of his husband, D is the father of A, and grand father of E. F.

There are two fathers, three brothers and mother in a group.

1. Who is the mother? (d)

a) A b) B c) C d) E

2. Who is his husband ? (c)

a) B b) C c) A d) F

3. How many male members are there in the group? (d)

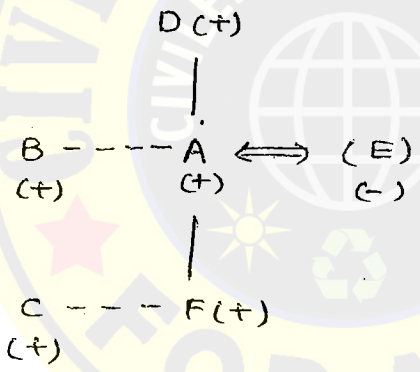
a) 1 b) 2 c) 3 d) 4

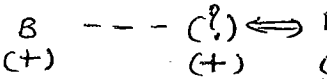
4. How is 'F' related to 'E'. (c)

a) Uncle b) Husband c) Son d) Daughter

5. Which of the following is a group of brother? (A)

a) ABF b) ABD c) BFC d) BDF





2. prashant Arora has three children Sangeeta, vimal, Asish. Asish married mounica is the eldest daughter of Mr. & Mrs. Roy. the Roy's married their youngest daughter to the eldest son of Mr. & Mrs. Sharma, who had two sons Amith and Sashi. the Roy's have two more children that is roshan and Vandana both are elder to veena. Sameer and Ajay are sons of Asish and Mounika. Rashmi is the daughter of Amith.

1. What is the surname of Sameer? (b)

a) Roy b) Arora c) Sharma d) can't be

2. How is Ajay related to Roshan ? (b)

a) son b) Nephew c) Neice d) son-in-law

3. What is the surname of Rashmi ? (c)

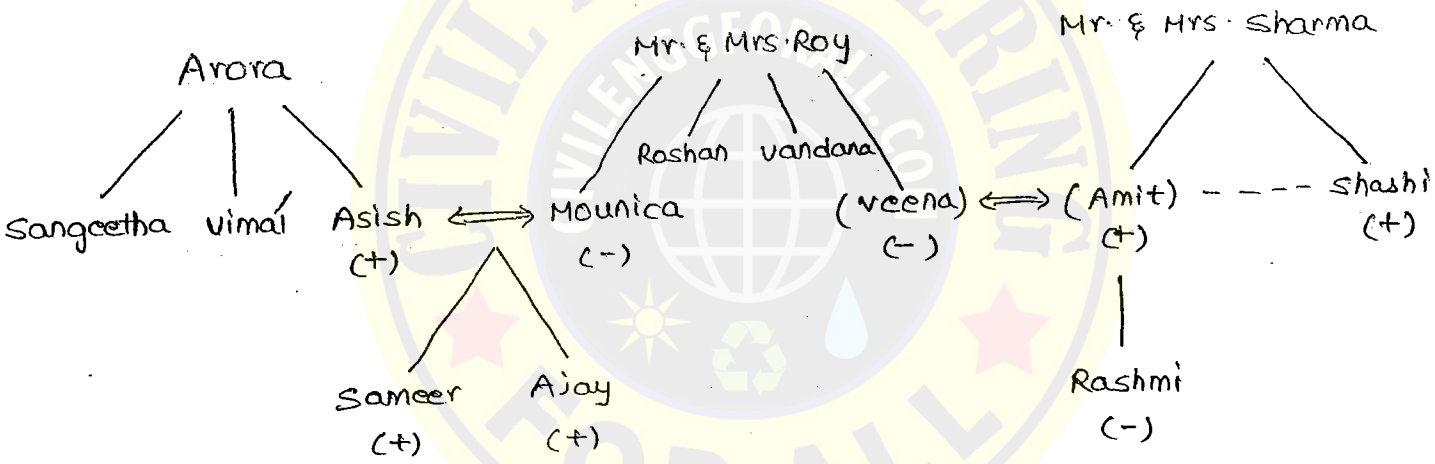
a) Arora b) Roy c) Sharma d) None.

4. How many children does Roy have? (c)

a) 2 b) 3 c) 4 d) more than 4

5. How is veena related to Sashi? (c)

a) wife b) sister c) sister-in-law d) cousin



Coded Blood relations :-

Q. Read the following information carefully and answer the question that follows.

A+B means "A is the son of B"

A-B means "A is the wife of "B"

A×B means "A is the brother of B"

A÷B means "A is the mother of B"

A=B means "A is the sister of B".

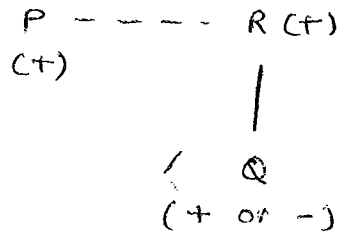
1) What does P × R ÷ Q means ? (c)

a) P is brother of Q

b) P is father of Q

c) P is uncle of Q

d) P is nephew of Q.



2. What does P = R + Q means?

Q. Read the following information carefully and answer the question that follows.

A + B means "A is the daughter of B"

A × B means "A is the son of B"

A − B means "A is the wife of B"

1. If P × Q − S → True ? (b)

a) S is wife of Q

b) S is father of P

c) P is daughter of Q

d) Q is father of P

2. If T − S × B − M, → False ? (d)

a) B is mother of S

b) M is husband of B

c) T is wife of S

d) S is daughter of B

Q.

P + Q means "P is the brother of Q"

P − Q means "P is the mother of Q"

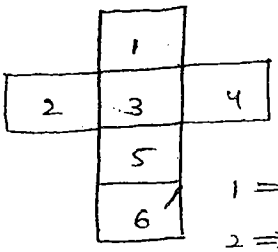
P × Q means "P is the sister of Q"

1. Which of the following means "M is the meternate uncle of R". (c)

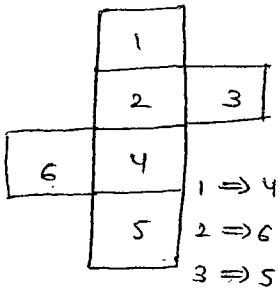
a) M + K + R b) M − R + K c) M + K − R d) M + K × R

NON VERBAL TEST OF REASONING

CUBES AND DICES

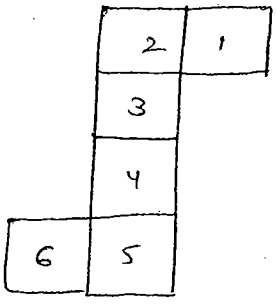


1 ⇒ 5
2 ⇒ 4
3 ⇒ 6

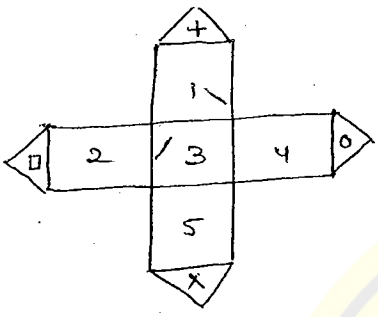


1 ⇒ 4
2 ⇒ 6
3 ⇒ 5

(opposite faces)



1 ⇒ 6
2 ⇒ 4
3 ⇒ 5

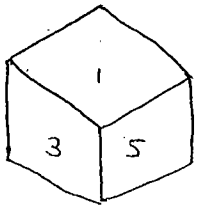


1 ⇒ 5
2 ⇒ 4
3 ⇒

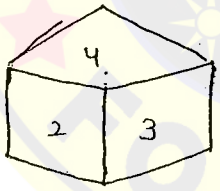
Model – I :-

1. In each of the following question one figure is given, if that figure is folded the following ~~fo~~ cubes are formed.

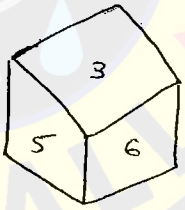
(a)



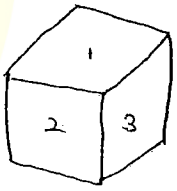
(b)

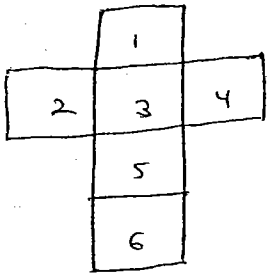


(c)



(d)





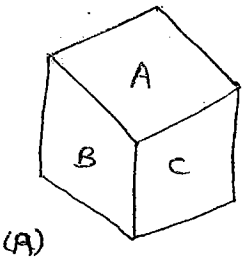
opp
1 ⇒ 5
3 ⇒ 6
2 ⇒ 4

Ans :- (d)

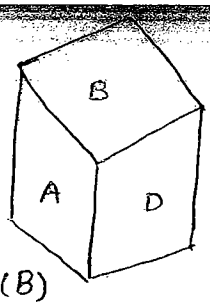
In (d) fig. 1 is opposite to 5 it is ~~not~~ 3 ⇒ 6, 2 ⇒ 4.

In other (a) fig. 1 is adjacent to 5 not correct. (b) 2 is adjacent to 4 not correct. (c) 3 is adjacent to 6 not correct.

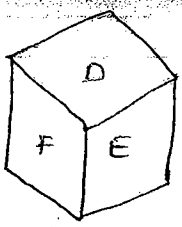
2)



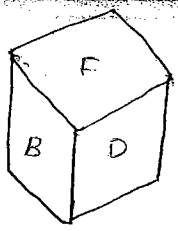
(A)



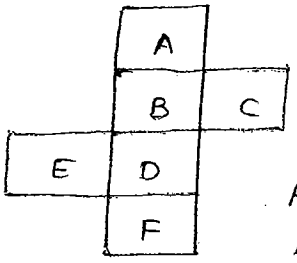
(B)



(C)



(D)

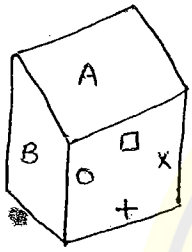


opposite
A ⇒ D
B ⇒ F
E ⇒ C

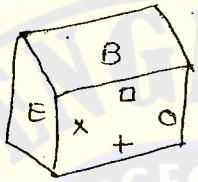
a) (A) & (B) only
b) (A) & (C) only
c) (D) only
d) All the above

[b]

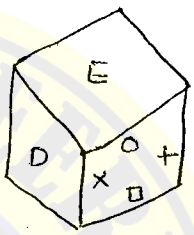
3)



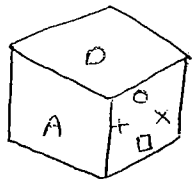
(A)



(B)

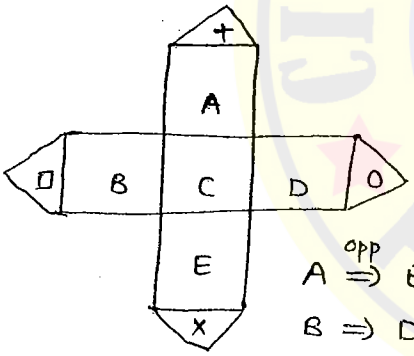


(C)



(D)

[c]

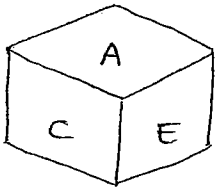


opp
A ⇒ E
B ⇒ D
C ⇒

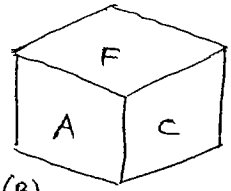
a) (A) & (B) only
b) (A) & (C) only
c) ~~(C) &~~ (D) only
d) All the above.

Model - II :-

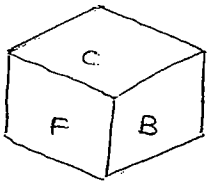
4)



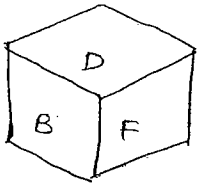
(A)



(B)



(C)



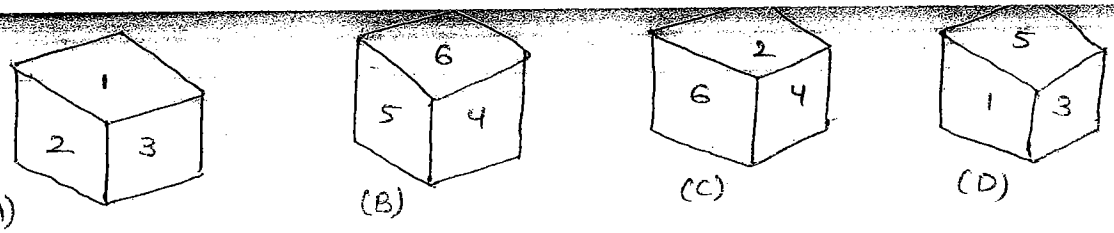
(D)

From above four positions of cube which base is opposit to face 'C'. [D]

adjacent
D ⇐ C ⇒ A, E, F, B

adjacent
(A) → C ⇒ A, E
(B) → C ⇒ A, F
(C) → C ⇒ F, B
(D) → C is not given

5.



In above four positions of cube if face '2' is top and which face is bottom. [D]

$5 \Leftarrow 2 \overset{opp}{\Rightarrow} 1, 3, 4, 6$

Data:-

A wooden cube of 8cm is painted with three different colors i.e., red, blue, green. Red painted on top and bottom and remaining faces and that oppose it are painted with remaining colors and cut into a cubical blocks of each face 2cm and answer the following questions.

1. How many cubes are there which are only one face painted with any color and remaining faces are unpainted. [D]

A) 4 B) 8 C) 12 D) 24

2. How many cubes are there which are only two faces painted with in any color and remaining faces are unpainted. [C]

A) 8 B) 12 C) 24 d) 32

3. How many cubes are there which are only three faces painted with ~~on~~ in any color and remaining faces are unpainted. [B]

A) 4 b) 8 c) 10 d) 12

4. How many cubes are there which are three faces painted with three different colors and remaining faces are ~~u~~painted. [A]

A) 8 b) 10 c) 12 d) 16.

5. How many cubes are ~~there~~ which are one face painted with red color and remaining faces are unpainted. [B]

A) 4 b) 8 c) 12 d) 14

6. How many faces are there two faces painted with red and blue and remaining faces are unpainted. [B] (21)

A) 4 b) 8 c) 12 d) 16

7. How many cubes are there which are two faces painte with red or blue. the remaining faces are painted (or) may not be painted. [C]

A) 8 B) 12 C) 16 D) 20

8. How many cubes are there. which are two faces painted with green color and remaining faces are unpaint [D]

A) 4 B) 8 C) 10 d) None

9. How many cubes are formed in all. [C]

A) 24 B) 32 C) 48 C) 64

n^3
$n = \frac{8}{2} = 4$
$\Rightarrow (4)^3 = 6$

10. How many cubes are there which are no face painte with any color. [B]

A) 4 b) 8 c) 12 d) None

$(n-2)^3$
$\Rightarrow (4-2)^3$
$\Rightarrow 8$

11. How many cubes are there which are atleast one fac painted with any color. [d]

A) 24 B) 32 C) 48 d) 56.

$n^3 - (n-2)^3$
$\Rightarrow 4^3 - 2^3$
$\Rightarrow 56$

12. How many cubes are there which are atleast two faces painted with any color. [C]

A) 12 b) 24 c) 32 d) 44.

13. How many cubes are there which are atleast three faces painted with any color. [B]

A) 4 b) 8 c) 12 d) None

Answers :-

1. 4 X 6 (faces) = 24

2. 2 X 12 (edges) = 24

3. 1 X 8 (corners) = 8

4. 1 X 8 = 8

5. 4 + 4 = 8
R + R

6. Red & ~~Red~~ Blue = 4+4 = 8
Blue

7. Red & blue = 8 + 8 = 16

8. None.

9. $n^3 = (4)^3 = 64$

$n = \frac{8\ cm}{2\ cm} = 4$ parts

10. $(n-2)^3 = (4-2)^3$

$= 8$

11. Total = 64

No-faces = 8

56

(or) $n^3 - (n-2)^3$

$= 56$

12. Atleast one = 56

only one = 24

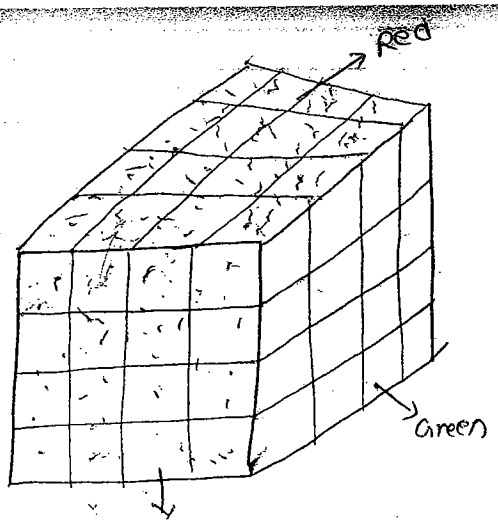
32

(or)

② + ③ Qs

24 + 8 = 32

13. 1 X 8 = 8



opp. of green also green

opp. of Red also Red

opp. of blue also blue

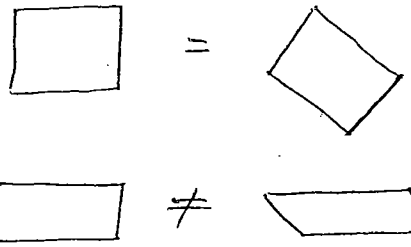
Cube Analysis:-

1. No. of faces = 6
2. No. of edges = 12
3. No. of corners = 8

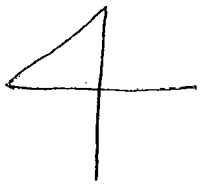
Q. A wooden cube of 18 cm painted with three different colors i.e., red, blue and green. Red painted on top and bottom and remaining faces at that opposite are painted with remaining colors and cut into a cubicle blocks of each face 2cm and answer the above problem questions.

Analytical Figures:-

Triangle = 3 sides + 3 angles
- Right angle
- Equilateral triangle
- Isosceles triangle
- Scalen triangle.



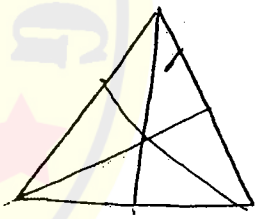
Straight line:-



Horizontal st. line = 1
verticle st. line = 1
Inclined st. line = 1
3 st. lines

1. How many straight lines and how many triangles are there in the following figure.

A. 16 triangles, 6 st-lines

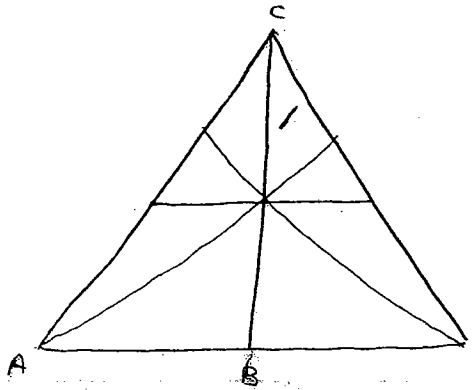


1 Fig. triangle = 3X2 = 6
2 Fig. triangle = 1X2 = 2 + C_1 = 3
3 Fig. triangle = 1X2 = 2 + C_4 = 6
6 Fig. triangle = 1
16

C - combined half part from I-part and remaining part from II-part.

2. How many straight lines and how many triangles are there in the following figure.

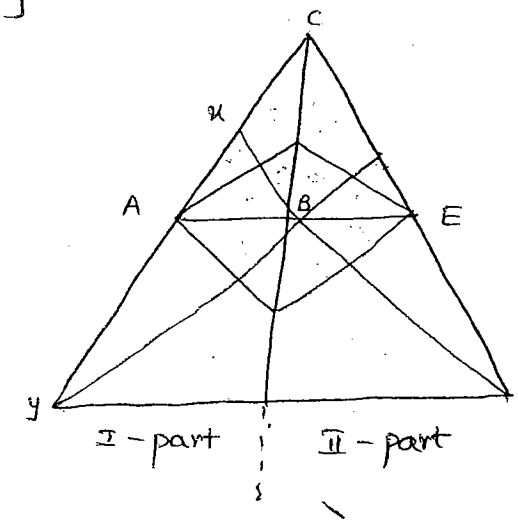
A. 7 straight lines, 23 triangles



1 F. triangle = 4x2 = 8
2F. triangle = 2X2 = 4 + C_1 = 5
3F. triangle = 1X2 = 2 + C_0 = 2
4F. triangle = 1X2 = 2 + C_5 = 7
&F triangle = 1 = 1

3. How many st. lines and how many triangles are there in the following figure. [ ]

A) 50 B) 51 C) 52 D) 53



A. No. of straight lines = 11

No. of triangles =

1F. triangle = 12 = 12

4F. triangles = 3+2+4 = 9

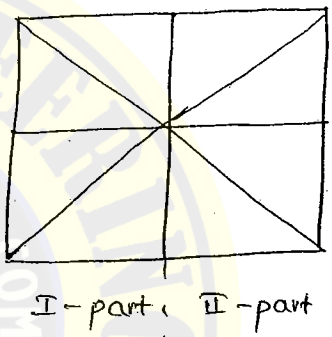
2F triangles = 4+4+2+2 = 12

6F triangles = 1+1+2 = 4

8F triangles = 2+1+1+1+2 = 7

16F triangle = 1

4. How many st. lines and how many triangles are there in the following figure.



A. straight lines = 8

triangles = 16

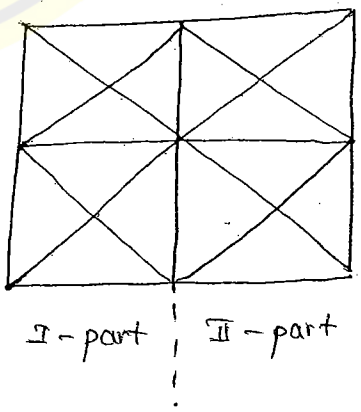
1F triangle = $4 \times 2 = 8$

2F triangle = $0 + C_4 = 4$

4F triangle = $0 + C_4 = 4$

16

5. How many straight lines and how many triangles are there in the following figure.



A: Straight lines = 12

triangles = 44

1F triangle = 16

2F triangle = 16

4F triangle = 4+4 = 8

8F triangle = 4

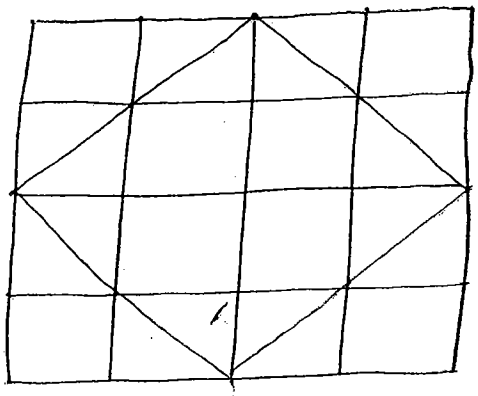
44

6. How many st. lines and how many triangles are there in the following figure. [ ]

a) 94 b) 96 c) 98 d) 99

A. No. of st. lines = 14

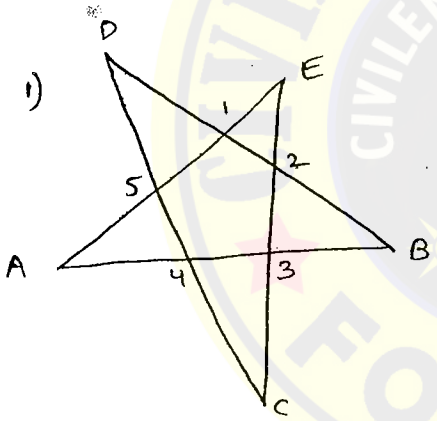
No. of triangles =



II – model :-

7. How many straight lines and how many triangles are there in the following fig.

1)



No. of st. lines = 5

No. of triangles = 10

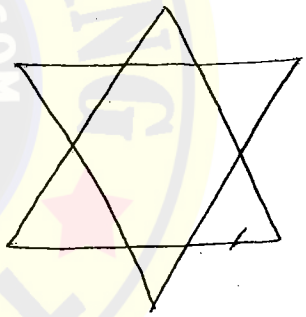
$AB_1 + CD_2 + AE_3 + BD_4 + CE_5$

= 5

1 F triangle = 5

10

2)



No. of st. lines = 6.

No. of triangles = 8

III – model :-

8. How many straight lines and how many parallelogram are there in the following figure.

No. of straight lines = 7

No. of parallelogram = 18

1 F. parallelogram = 6

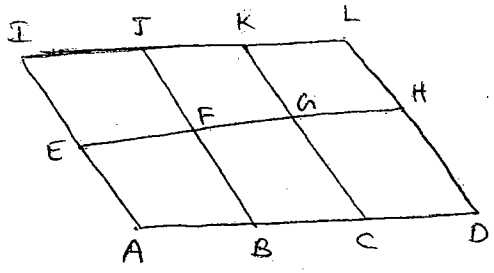
2 F. parallelogram = 7

4 F. parallelogram = 2

3 F. parallelogram = 2

6 F. parallelogram = 1

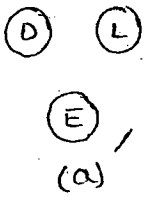
18



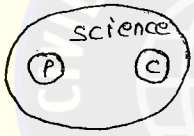
Logical venn diagrams :-

1. Statements to diagrams :-

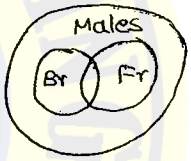
In each of the following questions three items are given and that follows some possible diagram then choose correct alternative with respect to the given above.



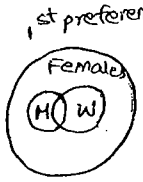
(a)



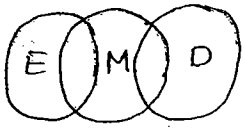
(b)



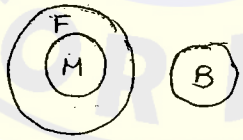
(c)



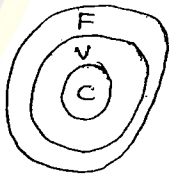
(c)



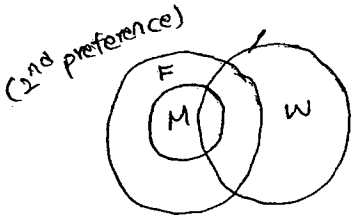
(d)



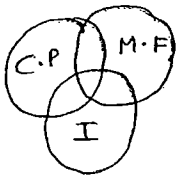
(E)



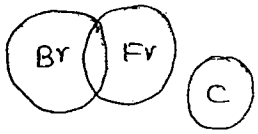
(F)



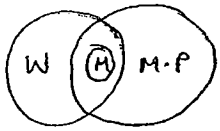
(g)



(h)



(i)



(j)

a) Doctors, Lawyers and Engineers

c) Brothers, males and fathers

b) Science, physics and chemistry

h) cricket players, match fixers, Indians.

f) carrots, vegetables and food

c) Mothers, widows and Females, (g) → 2nd preference (widow an widower b are same t go to this of

h) cricket players, tennis fans, Indians

j) Mothers, married people and womens

d) Males, doctors, Engineers

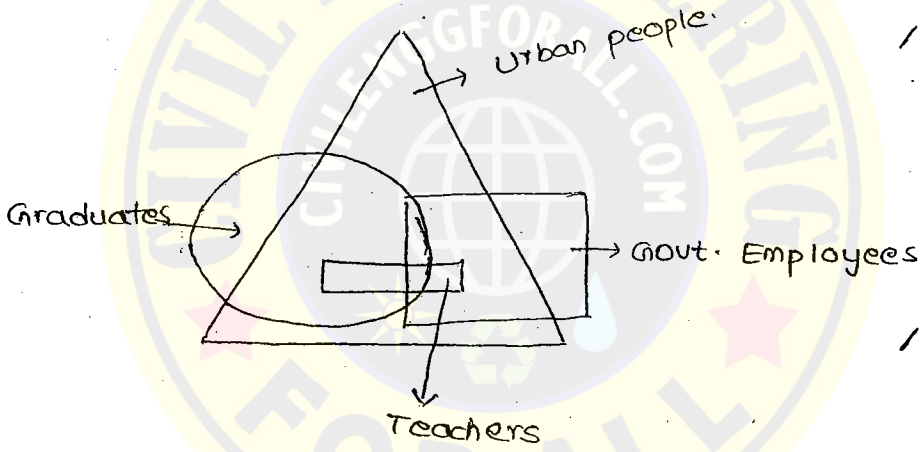
e) MOthers, females, Books

g) Fathers, males and Engineers

i) Brothers, Fathers and cars

2. Diagram to statement:-

Study the following diagram carefully and answer the question that follows.



1. At which of the following statements are definately true. [d]

A) All graduates are urban people

B) All government employees are urban people

c) All urban peoples are teachers

d) All teachers are urban people.

2. which of the following statements are not correct [e]

A) some graduates are from urban residency

B) some govt. employees are not from urban residency

c) some urban peoples are neither graduates nor govt. employees

d) some teachers are govt. employees.

e) All the above

3. Which of the following statements are false [D]

A) Some graduates are not from urban residency

B) Some govt. employees are from rural residency

c) some teachers are graduates and govt. employees

d) some teachers are from urban residency

4. Which of the following statements are not false [ ]

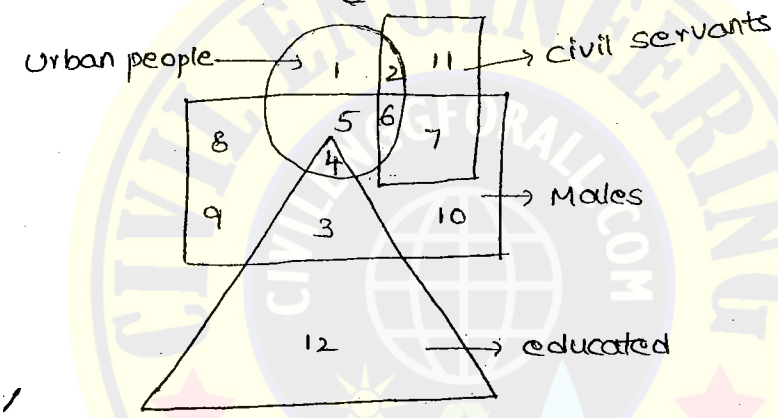
A) All govt. employees are graduates

B) All graduates are from rural residency

c) some urban graduates are govt. employees and teachers

d) All the above.

5. Study the following diagram carefully and answer the question that follows: { }



1. Urban uneducated male but not civil servant are represented by 5

2. Urban educated male but not civil servant are represented by 4

3. Urban uneducated male civil servant are represented by 6

4. Rural educated male but not civil servant are represented by 3

5. Urban uneducated women civil servant is represented by 2

6. Rural uneducated male civil servant are represented by 7

7. Urban uneducated women but not civil servant are represented by 1

8. Rural educated women but not civil servant are represented by 12

Arithmetical Reasoning

P.9 NO:- 15

1. $B - 3 = E$ $\quad B = ?$

$B + 3 = D$

$A + B = D + E + 10 \Rightarrow B + 3 + B - 3 + 10 \Rightarrow 2B + 10$

$B = C + 2 \Rightarrow C = B - 2$

$A + B + C + D + E = 133$

$\Rightarrow 2B + 10 + B - 2 + B + 3 + B - 3 = 133$

$\Rightarrow \boxed{B = 25}$

2. $B - 3 = A \Rightarrow 35 - 3 = A$ $\quad C = ?$

$D + 5 = E$

$A + C = 2E \Rightarrow 32 + C = 2 \times 30 \Rightarrow \boxed{C = 28}$

$B + D = A + C \Rightarrow B + 25 = 2 \times 30 \Rightarrow B = 35$

$A + B + C + D + E = 150$

$2E + 2E + E = 150$

$5E = 150$

$E = 30$

$\Rightarrow D = E - 5$

$= 30 - 5 = 25$

$\Rightarrow A + C = 2E$

$\boxed{C = 28}$

3. $H = M = x$

$4x + \frac{x}{2}(2) = 70$

$5x = 70$

$x = 14$

5. → (1)

$x \rightarrow$ [women] $\frac{1}{3}$ of $x \rightarrow$ [Married] $\frac{1}{2}$ of $(\frac{1}{3}$ of $x) \rightarrow$ [children] $\frac{1}{3}$ of $(\frac{1}{2}$ of $\frac{1}{3}$ of $x)$

$x \rightarrow$ [men] $\frac{2}{3}$ of $x \rightarrow$ [Married] $\frac{3}{4}$ of $(\frac{2}{3}$ of $x) \rightarrow$ [children] $\frac{2}{3}$ of $(\frac{3}{4}$ of $\frac{2}{3}$ of

→ (2)

Solving eq ① and ②

$$\frac{1}{3} \times \frac{1}{2} \times \frac{1}{3} \times x = \frac{x}{18}$$

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

$$\frac{x}{3} + \frac{x}{18} = \frac{7x}{18}$$

∴ Not having children $= x - \frac{7x}{18}$

$$= \frac{11}{18} x$$

6. Daughters age = x years ⇒ 23 years

Son's age = $(x+7)$ years

Father's age = $3x$

Mother's age = $3x - 9 \Rightarrow 3(23) - 9 \Rightarrow 60$ years

$$S = \frac{M}{2}$$

$$x + 7 = \frac{3x - 9}{2}$$

$x = 23$ years

7. Ravi's age at birth time = 0 years

Ravi's brother age = 3 years

Ravi's sister age = 4 + 3 = 7 years

Ravi's father age = 28 + 7 = 35 years − 3 = 32 years

Ravis mother age = 26 years − 3 = 23 years.

8. Rahuls age at birth time = 0 years

Rahul brother's age = 6 years

Rahul father's age = 32 + 6 = 38 years

Rahul mother's age = 38 − 3 = 35 years

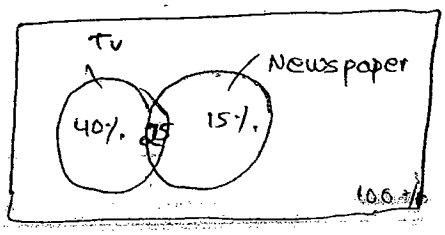
At the birth time of his sister = 25 years

∴ Rahul sister age = 10 years

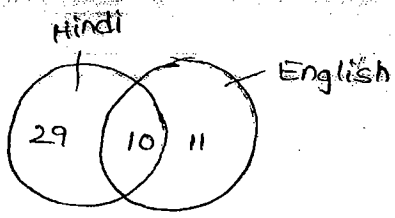
S	M
25	50
10	35
5	30
0	25

9. 100% − (40 + 25 + 15)

= 20%



10. Total = 50 − 21 = 29



Hindi = 39

Only Hindi = 29

Only English = 11

11. Atleast two papers = 12+8+5+2

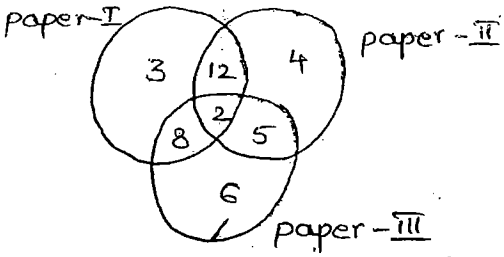
= 27

50 persons ⟶ 27

1 person ⟶ $\frac{27}{50}$

10,000 ⟶ ?

$\frac{27}{50} \times 10{,}000 = 5400$



12. All three = $\frac{5}{100} \times 120$

= 6

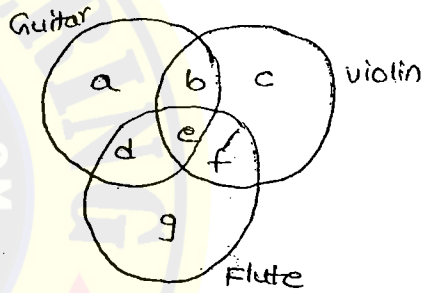
b+d+f = 30

a = 40

a+b+c+d+e+f+g = 120

40+30+6+c+g = 120

c+g = 44



13. planned to go picnic = x

Attended to picnic = x−4 ⇒ 12−4 = 8

They spend 96 Rs on eatables

$\frac{96}{x-4} - \frac{96}{x} = 4$

$96\left[\frac{x-x+4}{x(x-4)}\right] = 4$

$x^2 - 4x - 96 = 0$

$x(x-12)+8(x-12) = 0$

$x = 12, -8$

∴ 8 people attended.

CODING AND DECODING

P.9 NO:-25

A	B	C	D	E	F	G	H	I
J	K	L	M	N	O	P	Q	R
S	T	U	V	W	X	Y	Z	

1. MYSTIFY ⟺ NZTUJGZ

   NEMISES ⟺ MFNJTFT

2. NATURE ⟺ OCUWSG

   FAMINE ⟺ ? (+1) (+2) (+1) (+2) (+1) (+2)

   ∴ GCNKOG

3. COMPUTER ⟺ FPSOVUHS

   MEDICINE ⟺ ? (+3) (+1)

   ∴ PFJHDJQF

4. MONKEY ⟺ XDJMNL

   TIGER ⟺ ? QDFHS

   Y ⟷ X
   E ⟷ D
   K ⟷ J

   T ⟷ S
   I ⟷ H
   G ⟷ F
   E ⟷ D
   R ⟷ Q

5. ENTRY ⟺ 1 2 3 4 5

   STEADY ⟺ 9 3 1 7 8 5

   TENANT ⟺ ?

P.9 NO:- 26

2. 1. $44 \times 44 = 4444$

$34 \times 52 = 5423$
4 2 1 3

$81 \times 46 = ?$
4 2 1 3

$\Rightarrow 4168$

6. $137 + 276 = 435$

$731 + 672 = ?$

1	3	7
2	7	6
①	①	
4	3	5

7	3	1
6	7	2
①	①	
1	6	2	3

Octa language means in the given question the numbers are in b/w 1 to 7. So we are using octa language code.

Octa language

0 - 0
1 - 1
2 - 2
3 - 3
4 - 4
5 - 5
6 - 6
7 - 7

①

8 - 0
9 - 1
10 - 2
11 - 3
12 - 4
13 - 5
14 - 6
15 - 7

②

16 - 0
17 - 1

7. Given D = 4, COVER = 63 (3+15+22+5+18)

BASIS = ?

$2+1+19+9+19 = 50$

$\therefore 50$

8. $\overset{6}{\overline{REASON}} = 5 \Rightarrow 6-1$

$\overset{8}{\overline{BELIEVED}} = 7 \Rightarrow 8-1$

$\overset{10}{\overline{GOVERNMENT}} = ?$

$\Rightarrow 10 - 9 = \underline{9}$

11. GO = 32 (Take reverse G = 20, O = 12) $\Rightarrow Z = 1$, $Y = 2$, $X = 3$ like the

SHE = 49

SOME = ? $\overset{8+}{(12+14+22)}$

$= 56.$

14. LUNCH = 6 (1+2+1+1+1)

DINNER = 8 (1+2+1+1+2+1)

SUPPER = 8 (1+2+1+1+2+1)

BREAKFAST = ? (1+1+2+2+1+1+2+1+1)

= 12

All vowels are two
A E I O U – 2
All consonants – 1

15. BOOK – PEN = 8 [(2+15+15+11) – (16+5+14)]

PEN – NIB = ? [(16+5+14) – (14+9+2)]

= 10

17. ~~AT~~ x ~~EAT~~ = 5 (E)

~~SAT~~ x ~~SEAT~~ = 5 (E)

~~GO~~ x ~~GOAT~~ = 21 (AT)

~~EAR~~ x ~~TEAR~~ = ? (T) ⇒ 20

19. AROMA = 24 (1+18+15+13+1) ⇒ $\frac{48}{2}$ = 24

GRAND = 22 (7+18+1+14+4) ⇒ $\frac{44}{2}$ = 22

KWALITY = ? (11+23+1+12+9+20+25) ⇒ $\frac{101}{2}$ = 50·5

20. $\overline{\text{PLANT}}^{5}$ = 12·60 $\left(\frac{60}{5}\right)$ ⇒ 12·6

$\overline{\text{LEAVES}}^{6}$ = (12+5+1+22+5+19)

= $\frac{64}{6}$ ⇒ 10·66

29. White = blue = [red = yellow] = green = black = violet = orange

∴ yellow

31. Sand = air = Rock = [well = Drainage] = sky

∴ Drainage

32. bi nie pie ⇔ [some] good jokes

nie bat like ⇔ [some] real stories

pie like to ⇔ many good stories

Jokes ⇔ ? bi

INSERTING MISSING CHARACTER

NUMBER SERIES

$(+, -, \div, \times, x^p, R)$

- Increasing series $(+, \times, x^p)$
  - Rapid increment series $(x^p, \times)$
  - Gradual increment series $(+, \times)$
- Decreasing series $(-, \div, R)$
  - R.D.S $(R, \div)$
  - G.D.S $(-, \div)$

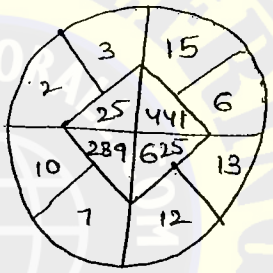
P.9 NO:- 28

1. $2+3=5 \Rightarrow 5^2=25$

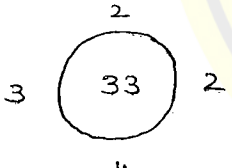
   $15+6=21 \Rightarrow 21^2=441$

   $10+7=17 \Rightarrow 17^2=289$

   $12+13=25 \Rightarrow 25^2=625$



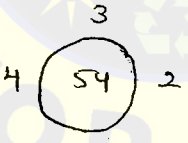
2.

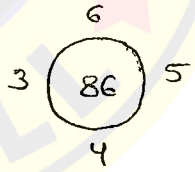


$3^2+2^2+4^2+2^2$

$= 9+4+16+4$

$= 33$





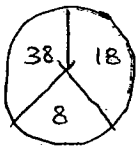
$3^2+6^2+4^2+5^2 \Rightarrow 9+36+16+25$

$\Rightarrow 86$

3.

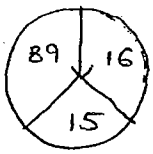
$25+17 = \frac{42}{7}$

$= 6$



$38+18 = \frac{56}{7}$

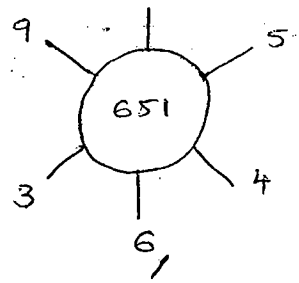
$= 8$



$89+16 = \frac{105}{7}$

$= 15$

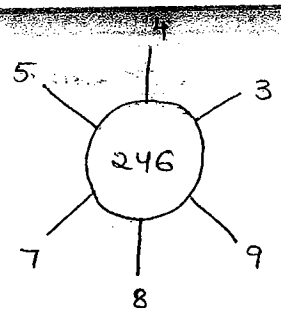
4.



$9-3=6$

$6-1=5$

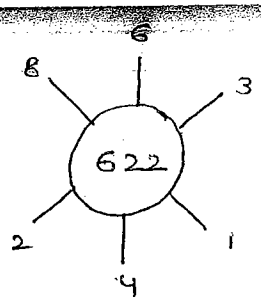
$5-4=1$



$7-5=2$

$8-4=4$

$9-3=6$



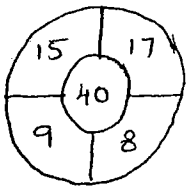
$8-2=6$

$6-4=2$

$3-1=2$

P.9 NO:-29

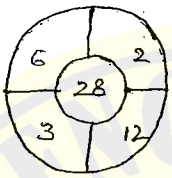
4.



$9 \times 8 = 72$

$15+17 = 32$ (-)

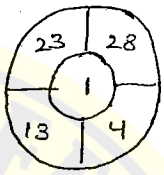
40



$12 \times 3 = 36$

$6+2 = 8$ (-)

28

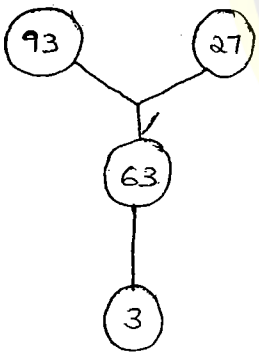


$13 \times 4 = 52$

$23+28 = 51$ (-)

1

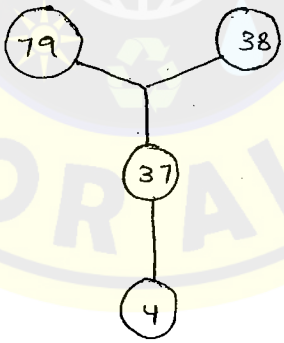
1.



$93-27 = 66$

63

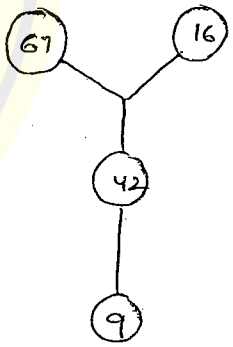
3



$79-38 = 41$

37

4

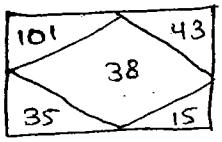


$67-16 = 51$

42

9

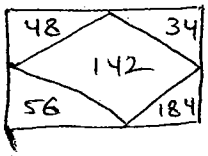
5.



$101+15 = 116$

$43+35 = 78$ (-)

38

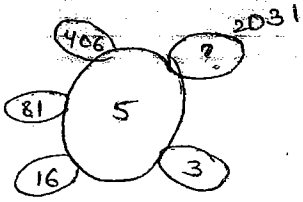


$48+184 = 232$

$56+34 = 90$ (-)

142

2.



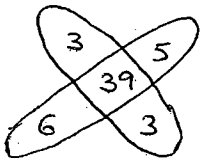
$5 \times 3 = 15 + 1 = 16$

$5 \times 16 = 80 + 1 = 81$

$81 \times 5 = 405 + 1 = 406$

$406 \times 5 = 2030 + 1 = 2031$

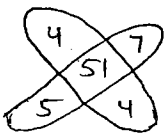
6.



$6 \times 5 = 30$

$3 \times 3 = 9$

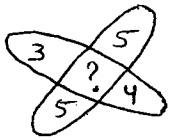
39



$7 \times 5 = 35$

$4 \times 4 = 16$

51



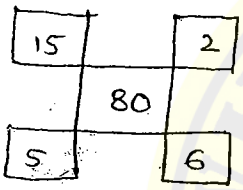
37

$4 \times 3 = 12$

$5 \times 5 = 25$

37

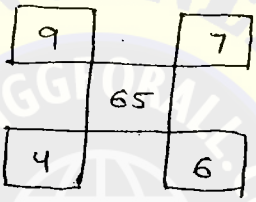
7.



$15 - 5 = 10$

$6 + 2 = 8$ (X)

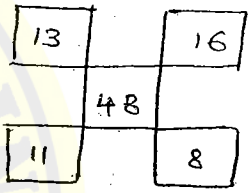
80



$9 - 4 = 5$

$7 + 6 = 13$ (X)

65

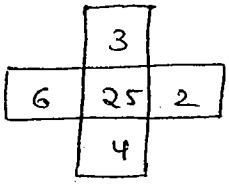


$13 - 11 = 2$

$16 + 8 = 24$ (X)

48

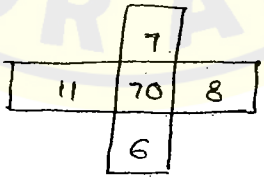
8.



$(6^2 + 3^2) - (4^2 + 2^2)$

$45 - 20$

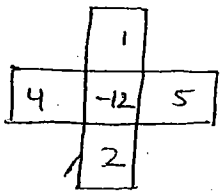
$= 25$



$(11^2 + 7^2) - (6^2 + 8^2)$

$= 170 - 100$

$= 70$



$(4^2 + 1^2) - (x^2 + 5^2) = -12$

$17 - x^2 - 25 = -12$

$x = \sqrt{4} = 2$

10.

6	18	15
3	2	5
4	3	3
8	27	9

$\frac{15 \times x}{5} = 9$

$x = 3$

$\frac{6 \times 4}{3} = 8$

$\frac{18 \times 3}{2} = 27$

$\frac{54}{2} = 27$

$27 = 27$

6-12-20

ANALYTICAL REASONING / PUZZLE TEST (5 to 6 M)

1. A is second to the left of B

A — B

A is sitting two places left of B

A — — B
two places

2. A is taller than B who is shorter than C

B

$\frac{A}{B}$ C

A is taller than B, who is shorter than C

A

C
A
B

∴ If , is not given then sentence is continues.

P.9 NO:- 31.

11 - 15 :-

i. A = 2B

ii) B = 4.5C

iii) $C = \frac{D}{2} \Rightarrow 2C = D$

iv) $D = \frac{E}{2} \Rightarrow 2D = E$

v) A E C

9C — A → more weight
4.5C — B
4C — E
2C — D
C — C → less weight

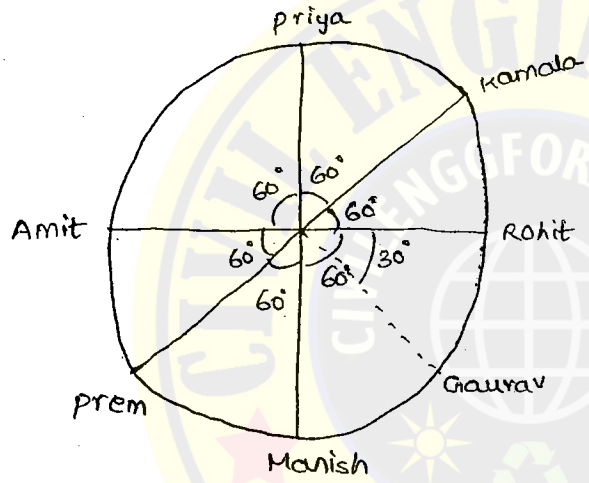
16 - 20)

U — Basket ball
Q — Football
T — Tennis
P, S — Cricket and Badminton
R — Volley ball

1 - 5)

		1st condition	2nd condition	3rd conditio
22 July	Sat	psychology	psychology	psychology
23 July	Sun	holiday	holiday	holiday
24 July	Mon	philosophy	philosophy	philosophy
25 July	Tue	Science	Sociology	Economics
26 July	Wed	Enggineering	Economics	Science
27 July	Thur	sociology	science	Engineering
28 July	Fri	Economics	Enggineering	sociology
29 July	Sat	Mechanics	Mechanics	Mechanics

6 - 10)



Total '7' members but 6 are sitting in equal distances

$= \frac{360}{6} = 60°$

11 - 15)

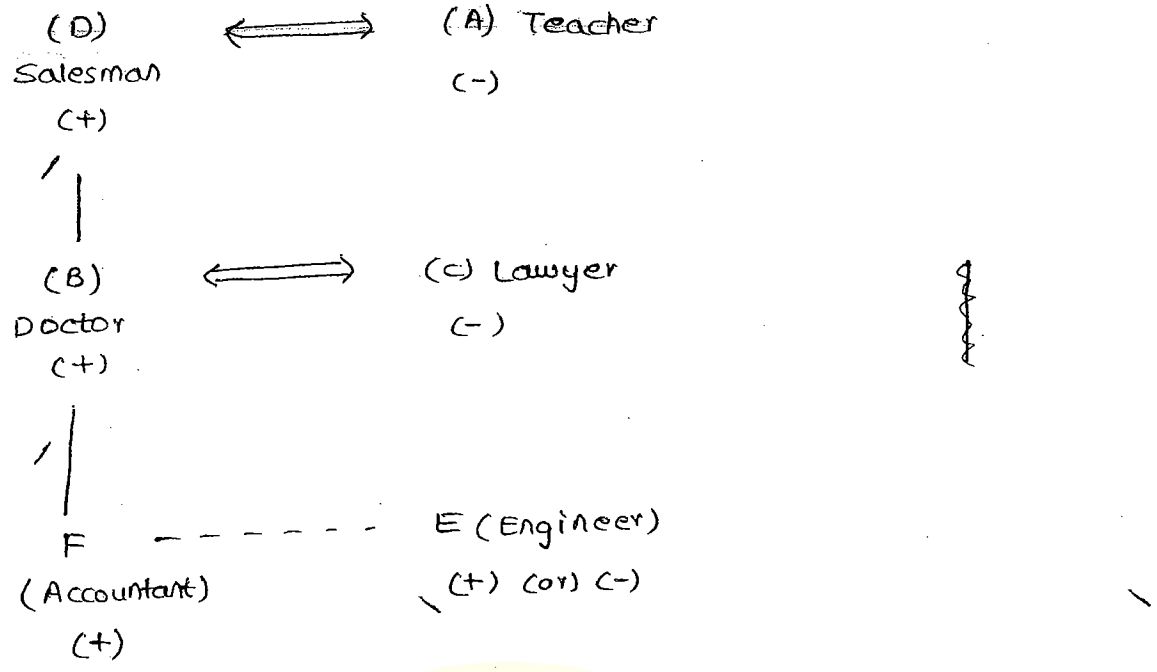
	A	B	C	D	E	F
Hill	X	✓	✓	✓	✓	✓
Historical	X	X	✓	X	X	✓
Industrial	✓	X	✓	X	✓	✓

16 - 20)

	Female					
	A	B	C	D	E	F
History	C	C	C	O		
Maths			O		O	C
physics					C	O
English	O			C		
Chemistry		O				

C - compulsory
O - optional

21-25)



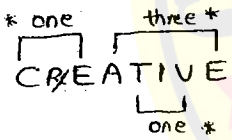
8-12-2014

ALPHABETICAL TEST

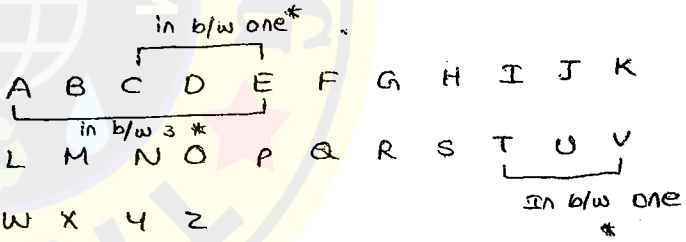
EX:- How many pairs of letters are there in the word CREATIVE which have has many letters b/w them in the word as in the English alphabet. [c]

a) 2 b) 1 c) 3 d) None.

A.



CE
AE
TV



Note:-

Like in above type of problems if same order is given then count alphabet in forward direction only. (⟹)

If Order was not mentioned then count forward and backward directions both. (⟺)

EX:- How many pairs of letters are there in the word "necessary" which have has many letters between them in the word as there are b/w them in the alphabet as in the same order. [a]

a) 1 b) 2 c) 3 d) None.

A. NECESSARY only one pair

Ex:- How many pairs of letters are there in the word "horigin" which have has many letters between them in the word as in the alphabet.

A. HORIZON

∴ Four pairs

Ex:- How many pairs of letters are there in the word BUCKET which have has many letters as in the engli alphabet in the same order.

A. BUCKET

∴ One pair

Ex:- How many pairs of letters are there in the wor DONATE which have has many letters between the in the word as there are in the english alphabet.

A. DONATE

∴ two pairs

Ex:-) The letters in the word "presence" have has man letters between them in the word as in the alphabe as in the same order. which one of the letters come earlier in the alphabet. [d]

a) C b) E c) R d) P e) None.

A. PRESENCE

PS → P comes first

Ex:- The letters in the word LEMON have has many letters between them in the word as in the alphabet, which one of the letters comes earlier in the alphabet

A. LEMON

LO
NO ⇒ L, O, N ⇒ 'L' comes earlier.

EX:- How many independent words STAINLESS be divided into without changing the order of the letters and using each letter only once.

A. STAINLESS

STAIN | LESS → 2 independent words.

EX:- How many independent word HEARTLESS be divided into without changing the order of the letters and using each letter only once.

A. HE | ART | LESS

∴ 3 independent words.

EX:- From the word ASTOUNDER, how many independent words can be made without changing the order of the letters and using each letter only once.

A. AS | TO | UNDER

∴ 3

* EX:- If the last four letters of the word "concentration" are written in reverse order followed by next two in the reverse order and next three in reverse order followed by first four in the reverse order and counting from the end. which letter would be 8th from the new arrangement. [D]

a) N b) T c) E D) R

A. CONCENTRATION

8th ←

NOITA(R)TNECNOC

EX:- First and thrid letters in the word necessary were interchange, also the fourth and sixth letters, seventh and Ninth letters. Which of the following would be 7th letter from left end.

A. ~~NESSA~~

NECESSARY

1 2 3 4 5 6 7 8 9

∴ Y

Ex:- If the positions of the first and sixth letters in th word "distribute" are interchange, similarly the positions of the 2nd and 7th letters, the 3rd and 8th letters and swap which of the following letters 5th from the left after interchanging the positions.

A. DISTRIBUTE

1 2 3 4 5 6 7 8 9 10

∴ E

Ex:- If the positions of the 3rd and 10th letters of the word DOCUMENTATION are interchange and like wise the positions of the 4th and 7th letters, 2nd and 6th lette is also interchange, which of the following will be 11th letter from the right end.

DOCUMENTATION

1 2 3 4 5 6 7 8 9 10 11 12 13

∴ T

Ex:- If the 1st and 2nd letters in the word DEPRESSION were interchange also 3rd and 4th letters, 5th and 6th letters and swan. which of the following would be 7th letter from the right [e]

a) R b) O c) S d) I e) None.

DEPRESSION

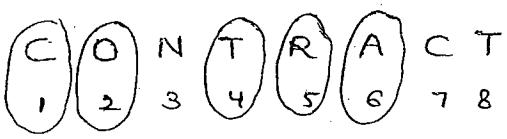
← 7th letter

EDRPSEISNO

∴ P

Ex:- A meaningfull word starting with A is made from the first, second, 4th and 5th, 6th letters of the word CONTRACT. which of the following is the middle letter of that word.

a) C, b) D c) R d) T e) None.



COTRA

ACTOR (meaningfull word)

∴ T

Ex:- A meaningfull word with the 3rd, 5th, 8th and 10th letters of the word "distribute". Which of the following will be 3rd letter of that word. If no such word can be made give 'X' as answer. More than such word give 'M' as the answer.

S R U E

SURE

USER

∴ More than two words ⇒ M.

Ex:- If we make a meaningfull word with the 1st, 4th, 9th, 14th letters of the word ADMINISTRATION, which of the following will be the 3rd letter of that word from the right end, if no such word can we make 'X' as the answer and if more than one such word can we make give 'M' as the answer. [a]

a) A b) T c) N d) R e) None.

A	D	M	I	N	I	S	T	R	A	T	I	O	N
1	2	3	4	5	6	7	8	9	10	11	12	13	4

A I R N

R A I N

I R A N
N A I R
R A N I
} Nouns are not meaningful words

∴ A

Ex:- If it is possible to make a meaningful word with the 4th, 8th, 7th and 10th letters of the word COUNTERACT. which of the following will be last letter of the word. If no such word can we make give 'x' as the answer. If more than one such words can we made give 'M' as the answer.

a) A b) N c) T d) X e) M

C	O	U	N	T	E	R	A	C	T
1	2	3	4	5	6	7	8	9	10

N A T

A N T

T A N

∴ Two meaningful words ⇒ 'M'

Rule reduction formation:-

Ex:- No. of letters skipped in between adjacent letters in the series is two. which of the following series absorb this rule. [d]

a) QSV4ZCF b) SVZCAIN c) ZCAKMPR d) MPSV4BE

[2] [2] [2]
M P S V 4 B E
[2] [2] [2]

EX:- No. of letters skipped in between adjacent letters in the series is odd. which of the following series absorb this rule. [d]

a) FIMRX b) EIMQV c) MPRUX d) BDHLR

Odd
1, 3, 5, 7, ...

F [2] I M R X X

E [3] I [3] M Q V X
[3] [4]

d) B [1] D [3] H L R
[3] [5]

EX:- No. of letters skipped in between adjacent letters in the series increases by one. Which of the following series absorb this rule. [d]

a) CPTOV b) HCFKP c) HJHQU d) IKNRW

d) I [1] K [3] N R W
[2] [4]

EX:- No. of letters skipped in between adjacent letters in the series are multiple of three. Which of the following series absorbs this rule. [a]

a) AELPZ b) GKOTZ c) LORUX d) DHLPU

Multiple of 3
3, 6, 9, 12...

A [3] E [3] L P Z
[3] [9]

EX:- No. of letters skipped in between adjacent letters in the series is in the order of $1^2, 2^2, 3^2, \ldots$ which of the following series absorb this rule given above.

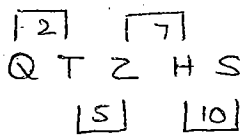
a) CEJT b) EGLO c) EGLP d) RTWZ

C [1] E [9] J T
[4]

$1^2, 2^2, 3^2$
1, 4, 9

Ex:- No. of letters skipped in between adjacent letters in the series is in the order of 2, 5, 7, 10. which of the following series absorbs the rule given above. [C]

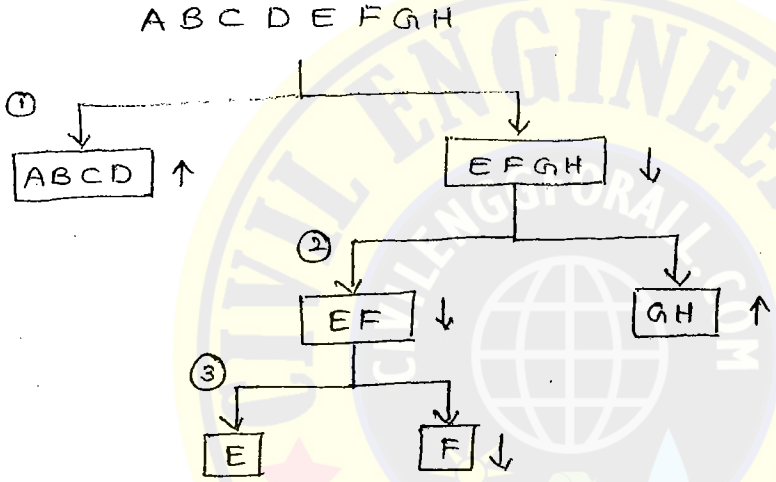
a) CEGLJ b) FNKOT c) QTZHS d) SYBEP



LOGICAL PUZZLES

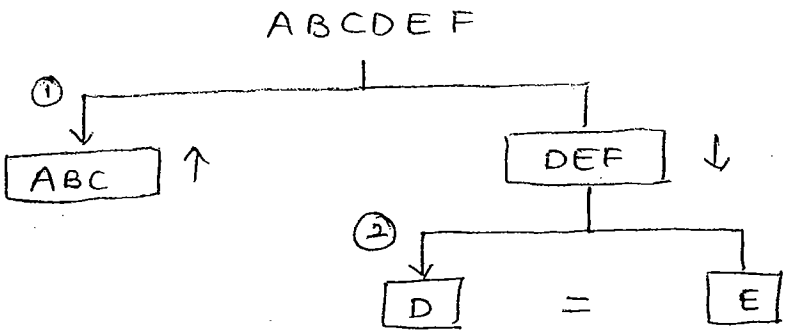
P.9 NO:- 35

1.



∴ 3 times weighing

Another way let us pickup 6 bags among 8 bags and weighing it



∴ Both are equal, the heavier bag is F

∴ In this method two times weighing.

∴ The minimum number of weighing required to identify the heavier bag is 2

2. $x+y=14 \rightarrow ① \times 10$

$20x+10y=230 \rightarrow ②$

$10x+10y=140$

$10x=90$

$x=9$

$9+y=14$

$\boxed{y=5}$

6. Given 100 wines, succesfully delievered for each glass = 3 ps

$100 \times 3 = 300$ paise $= 3$ Rs.

Rs. 3 — Rs. 2.40

60 paise

$G + B = 100 \rightarrow ① \times 3$

$3G + 3B = 300$

$3G - 9B = 240 \rightarrow ②$

$12B = 60$

$B = 5$

∴ Broken glasses $= 5$

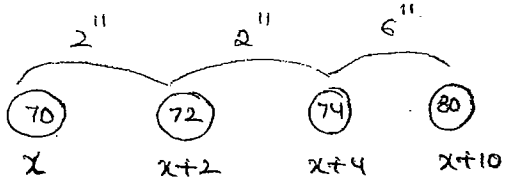
5×9 paise $= 45$ paise but there are 60 paise

∴ the remaining 15 paise (3×5 ps / glasses) are not given because if he succesfully delieved the glass that amount will be counted. He is broken so we reduced 15 paise.

3. Avg. height $= 74''$

$$74 = \frac{x+x+2+x+4+x+10}{4}$$

$x = 70$



5. Upside down = Mirror Image + water Image

0 1 6 8 9 (original image)

↓ ↓ ↓ ↓ ↓

0 1 9 8 6 (upside down image)

a) 81 ⟶ $(9)^2$

(b) 101 ⟶ X

(c) 169 ⟶ $(13)^2$ ⟹ 691 = (X) not perfect square

(d) 196 ⟶ $(14)^2$
↓
961 ⟹ $(31)^2$
} It is a perfect square

∴ No. is '196'.

P.9 No:- 37

4. 0, 1, 6, 8, 9 (1 0 9 6 8) ← check it options → actual number
(+)
7 8 6 3 3
(=)
(8 9 6 0 1) → upside down imag

P.9 No:- 36

5. a) 1+3+9+27 = 40 X

c) 1+3+9+27+81 = 121 ✓

121 pounds → nearest
1 pound

7. 1 | 2 | 3 — 25 no's
24 + 24 + 24
24 × 25 = 600

8. Check option (i) denominator is greater than '6' than numerator

9. Must no. of matching pairs = n+1
= 2+1
= 3

n = no. of colors

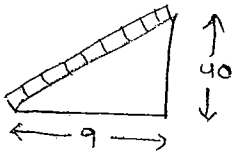
W | B
20 no's | 20 no's
40 no's

W B
W B
W B

P.9 No:- 37

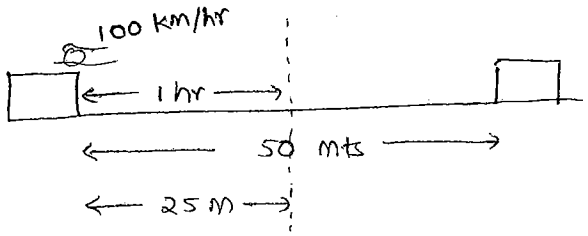
6. No. of pairs = n+1
= 3+1 = 4

10. $\sqrt{9^2+40^2}$ = 41 feets



1. To meet the trains 1 hour time required because the distance between 50 at centre point they meet.

For 1 hour time the bird can travel 100 km



2. 2000/- per year, 1000 per every half year

	300 per year	100 each half year
1st year	1000 + 100 = 2000	1000 + 1100 = 2100
2nd year	1150 + 1150 = 2300	1200 + 1300 = 2500
3rd year	1300 + 1300 = 2600	1400 + 1500 = 2900

3. As many as you mean equal.

a) $\begin{array}{c} 4 \\ +1 \\ \hline 5 \end{array} \neq \begin{array}{c} 8 \\ -1 \\ \hline 7 \end{array}$

b) $\begin{array}{cc} 3 & 5 \\ +1 & -1 \\ \hline 4 & \neq \ 4 \\ \hline -1 & +1 \\ \hline 2 & 6 \end{array}$

2 × 3 thrice

c) $\begin{array}{cc} 5 & 7 \\ +1 & -1 \\ \hline 6 & = \ 6 \\ \hline -1 & +1 \end{array}$

4 × 2 twice

5. C.P > S.P = Loss ; Loss = C.P − S.P

$$\text{Loss \%} = \frac{\text{C.P} - \text{S.P}}{\text{C.P}} \times 100$$

C.P < S.P = profit ; profit = S.P − C.P

$$\text{profit \%} = \frac{\text{S.P} - \text{C.P}}{\text{C.P}} \times 100$$

$$C.P = \frac{100}{100 - L\%} \times S.P$$

$$C.P = \frac{100}{100 + P\%} \times S.P$$

S.P = 600 % each

Total S.P = 600 + 600 = 1200

C.P = 750 + 500 = 1250

Loss = 50 %

1. $C.P = \frac{100}{100-20} \times 600 = 750$

2. $C.P = \frac{100}{100+20} \times 600 = 500$

7. 25 W, 20 D, 18 DE, 12 B.E

5W = 4D W : D = 4 : 5

12D = 9DE D : DE = 9 : 12 = 3 : 4

6DE = 8B DE : B = 8 : 6 = 4 : 3

W : D : DE : B

4 : 5

3 : 4

4 : 3

(4 x 3 x 4) : (5 x 3 x 4) : (5 x 4 x 4) : (5 x 4 x 3)

12 : 15 : 20 : 15 = W : D : DE : B

25W : 20D : 18DE : 12B = 25 x 12 : 20 x 15 : 18 x 20 : 12 x 15

= 5 : 5 : 6 : 3 ⟶ Total 19 parts

19 parts = 1330

1 part = 70

⇒ 5 x 70 : 5 x 70 : 6 x 70 : 3 x 70

⇒ 350 : 350 : 420 : 210

~~Short cut~~ :-

25 = W

20 = D

A B

9. At present $x : y$

After T years $a : b$

① At present age of A $= \frac{xxT(a-b)}{xb-ya}$

② At present age of B $= \frac{yxT(a-b)}{xb-ya}$

③ After T years aged A $= \frac{axT(x-y)}{xb-ya}$

④ After T years aged B $= \frac{bxT(x-y)}{xb-ya}$

	F	:	S
At present	4	:	1
After 30 years	2	:	1

$$F = \frac{4 \times 30 \times (2-1)}{4-2} \qquad S = \frac{1 \times 30(2-1)}{4-2}$$

$F = 60$ years $\qquad = 15$ years

11. $x - y = 3$

$x^2 - y^2 = 51$

$(x+y)(x-y) = 51$

$x + y = \frac{51}{3} = 17$

$x + y = 17$

$x - y = 3$

$2x = 20$

$x = 10$

$y = 7$

12. condition - ① Reversing woman and husbands age

condition - ② Difference of their age $= \frac{1}{11}$ of their sum

ⓐ 34, 43

$9 = \frac{(34+43)}{11}$

$9 \neq 7$

ⓑ 45 54

$9 = \frac{99}{11}$

$9 = 9$

13. 100 kg — 100 people

old	young	child
3 kg	2 kg	$\frac{1}{2}$ kg

(a) 5, 45, 50 = 100 ✓ (b) 5 + 15 + 75 = 95 ✗

(c) 5 + 25 + 70 = 100 ✓ (d) 5 + 70 + 80 = 155 ✗

(a) → $5\times3 + 45\times2 + 50\times0.5 = 130 > 100$

(c) → $5\times3 + 25\times2 + 70\times0.5 = 100 = 100$

14. $h+c = 40$; $h+s = 60$; $c+s = 90$

In one day they can eat

$h+c = \frac{1}{40}$ $h+s = \frac{1}{60}$ $c+s = \frac{1}{90}$

All in one day

$$h+c+h+s+c+s = \frac{1}{40}+\frac{1}{60}+\frac{1}{90}$$

$$h+c+s = \frac{19}{720} \text{ in one day}$$

whole pastur can eat all $= \frac{720}{19}$ days

15. x, y $x \sim y = 30$

$$x \times y = 1624$$

$$y = \frac{1624}{x}$$

$$\frac{1624}{x} - x = 30$$

$$1624 - x^2 = 30x$$

$$x^2 + 30x - 1624 = 0$$

$$x = 28$$

16. (a) 5 and 6 $\Rightarrow 5^2 - 6^2 = 9$ not cube ✗

(c) 5 and 10 $\Rightarrow 5^2 - 10^2 = 75$ not cube ✗

✓(d) 10 and 6 $\Rightarrow 10^2 - 6^2 = 64 \Rightarrow (4)^3$

$$10^3 - 6^3 = 1000 - 216$$

$$= 784$$

$$= (28)^2$$

10-12-20

MATHEMATICAL OPERATIONS

+, −, ×, ÷ are Mathematical symbols

>, <, ≥, ≤ are mathematical statements

1. If + means ÷, − means ×, × means −, ÷ means +. Which of the following will be value of expression $16 \div 8 - 4 + 2 \times 4$

A. + ⇏ ÷
− ⇒ ×
÷ ⇒ +
× ⇒ −

$16 \div 8 - 4 + 2 \times 4 \Rightarrow 16 + 8 \times 4 \div 2 - 4$

Then follow

B = Bracket
O = of
D = Divison
M = Multiply
A = Addition
S = Subtraction

$\Rightarrow 16 + 8 \times 4 \div 2 - 4$

$= 16 + 8 \times 2 - 4$

$= 16 + 16 - 4$

$= 32 - 4$

$= 28$

2. If + means ÷, − means ×, ÷ means +, × means −. Then $36 \times 12 + 4 \div 6 + 2 - 3 = ?$

A) $36 \times 12 + 4 \div 6 + 2 - 3 \Rightarrow 36 - 12 \div 4 + 6 \div 2 \times 3$

$= 36 - 3 + 3 \times 3$

$= 36 - 3 + 9$

$= 45 - 3$

$= 42$

3) If × = ÷, − means ×, ÷ means +, + means −. then $(3 - 15 \div 19) \times 8 + 6 = ?$

A. $(3 - 15 \div 19) \times 8 + 6 \Rightarrow (3 \times 15 + 19) \div 8 - 6$

$\Rightarrow (45 + 19) \div 8 - 6$

$\Rightarrow 64 \div 8 - 6$

$\Rightarrow 8 - 6$

$= 2$

4. If ÷ means +, − means ÷, × means −, + means ×.
Then $\frac{(36 \times 4) - 8 \times 4}{4 + 8 \times 2 + 16 \div 1} = ?$

A. $\frac{(36 \times 4) - 8 \times 4}{4 + 8 \times 2 + 16 \div 1} \Rightarrow \frac{(36 - 4) \div 8 - 4}{4 \times 8 - 2 \times 16 + 1}$

$\Rightarrow \frac{32 \div 8 - 4}{32 - 32 + 1}$

$\Rightarrow \frac{4 - 4}{1} = \frac{0}{1} = 0$

5. If P means ÷, Q means ×, R means +, S means −
Then $18 \overset{12}{Q} P 4 R 5 S 6$

A. $18 Q 12 P 4 R 5 S 6 \Rightarrow 18 \times 3 + 5 - 6$

$= 53$

6. If L means ×, M means ÷ P means +, Q means −
then $16 P 24 M 8 Q 6 M 2 L 3 = ?$

A. $16 P 24 M 8 Q 6 M 2 L 3 \Rightarrow 16 + 3 - 3 \times 3$

$= 10$

7. If × means −, ÷ means +, + means ÷, − means ×
then which equation is correct.

a) $50 - 5 \div 5 \times 20 + 10 = 6$ b) $8 \div 10 - 3 + 5 \times 6 = 8$

c) $6 \times 2 + 3 \div 12 - 3 = 50$ d) $3 \div 7 - 5 \times 10 + 3 = 10$

A. a) $50 \times 5 + 5 - 20 \div 10 = 6$

$250 + 5 - 2 = 6$

$255 - 2 = 6$

$253 \neq 6$

b) $8 + 10 \times 3 \div 5 - 6 = 8$

$8 + 10 \times \frac{3}{5} - 6 = 8$

$8 + 6 - 6 = 8$

$14 - 6 = 8$

$8 = 8$

8. If P means +, Q means −, R means ×, S means ÷
which one is correct?

a) $36 R 4 S 8 Q 7 P 4 = 10$ b) $16 R 12 P 49 S 7 Q 9 = 200$

c) $325 8 R 9 = 16 Q 12 R 12$ d) $8 R 8 P 8 S 8 Q 8 = 57$

A) (b) $16 \times 12 + 49 \div 7 - 9 = 200$

$192 + 7 - 9 = 200$

$199 - 9 = 200$

$190 \neq 200$

(c) $32 \div 8 \times 9 = 16 - 12 \times 12$

$4 \times 9 = 16 - 144$

$32 \neq 16 - 144$

(d) $8 \times 8 + 8 \div 8 - 8 = 57$

$64 + 1 - 8 = 57$

$65 - 8 = 57$

$57 = 57$

9. If > means +, < means −, + means ÷, ∧ means ×, − means =, × means >, = means <. Then choose correct statement in each of the following.

a) $6 + 3 > 8 = 4 + 2 < 1$

b) $4 > 6 + 2 \times 32 + 4 < 1$

c) $8 < 4 + 2 = 6 > 3$

d) $4 + 7 > 3 = 6 + 3 > 2$

A) (a) $6 \div 3 + 8 < 4 \div 2 - 1$

$2 + 8 < 2 - 1$

$10 < 1$ ✗

(b) $4 + 6 \div 2 > 32 \div 4 - 1$

$4 + 3 > 8 - 1$

$7 > 7$ ✗

(c) $8 - 4 \div 2 < 6 + 3$

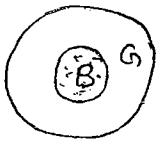
$8 - 2 < 9$

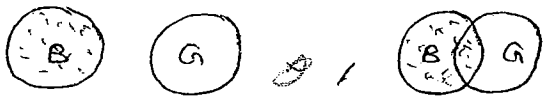
$6 < 9$

LOGICAL REASONING

Procedure for solving above types of problems with venn diagram method.

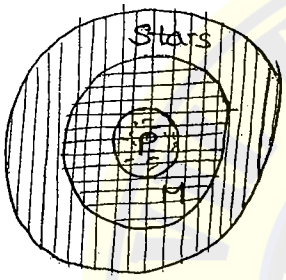
1. Draw all possible venn diagrams from given statement.
2. Choose the conclusions if any present in the diagram.
3. Ex:- All boys are girls No boys are girls some boys are girls



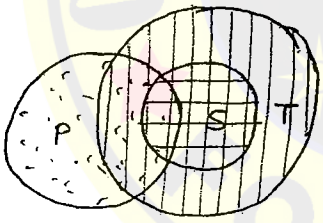


P.9 NO:-45

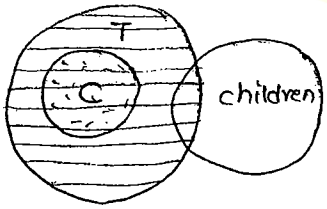
1.



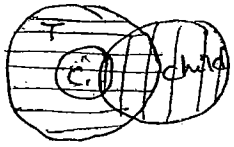
4.



6.

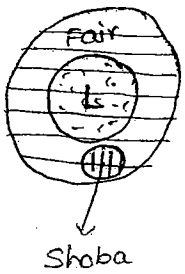


(Guess)



In both diagrams common option is the answe

12.



II

(Guess diagram)

I

∴ (C) if either I or II follows

11-10-2017

QUANTITATIVE APTITUDE

RATIOS AND PROPORTIONS

A : B :: C : D

AD = BC

A : B = 2 : 3
B : C = 4 : 5

A : B : C = 8 : 12 : 15

A : B = 1 : 2
B : C = 3 : 4
C : D = 5 : 6

A : B : C : D = 15 : 30 : 40 : 45

P.g NO:- 61

Ex:- 1. A : B = 8 : 15
B : C = 8 : 8
C : D = 4 : 8
A : D = 4 : 15

2. M : F
7 : 4 → 11 × 12 = 132
M = 84
7P = 84
1P = 12

there are 84 males

3. P : Q : R
2 : 3 : 5 → 5 × 100 = 500.

7P > 3P = 400/-
4P = 400
1P = 100

4. M : P : B
5 : 7 : 8
40% 50% 75%

$\frac{5 \times 140}{100} : \frac{7 \times 150}{100} : \frac{8 \times 175}{100}$

2 : 3 : 4

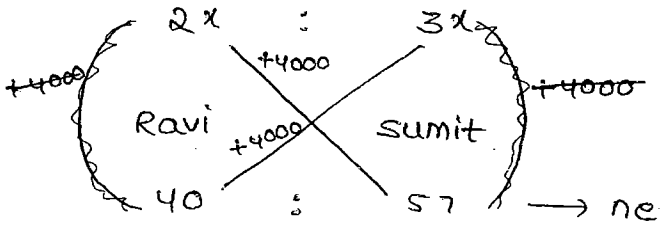
10% of $x = \frac{10}{100} \times x = \frac{x}{10}$

10% ↑ $= x + \frac{x}{10} = \frac{11x}{10}$

10% ↑ = $\frac{110}{100}$

5. Ravi Sumit

Salary increased by 4000



$(2x+4000)57 = (3x+4000)40$

$x = 21,000$

∴ None of these.

6. $A = \frac{2}{3}B \Rightarrow A : B = 2 : 3$

$B = \frac{1}{4}C \Rightarrow B : C = 1 : 4$

$A : B : C = 2 : 3 : 12$

$= 2\times30 : 3\times30 : 12\times30$

$= 60 : 90 : 360$

17p = 510

1p = 30

7.

A	B	C
3	4	5
5%	10%	15%

(3+4+5)

12p = 2400

1p = 200

2430 ← 30 ← 30%

2400

$4 \times 200 = 800$

10% +

810

P·9 NO:- 62

1. Mixture of 60 lit

Milk water

2 : 1

$\Rightarrow \frac{60}{3} = 20$ each part

$\Rightarrow (2\times20) : (1\times20)$

40 lit : 20 lit :: 1 : 2 (new ratio)

+x

$(40\times2) = (20+x)\times1$

$x = 60$ lit

∴ 20 + x

2. Mixture = 20 lit
−4 lit
16 lit

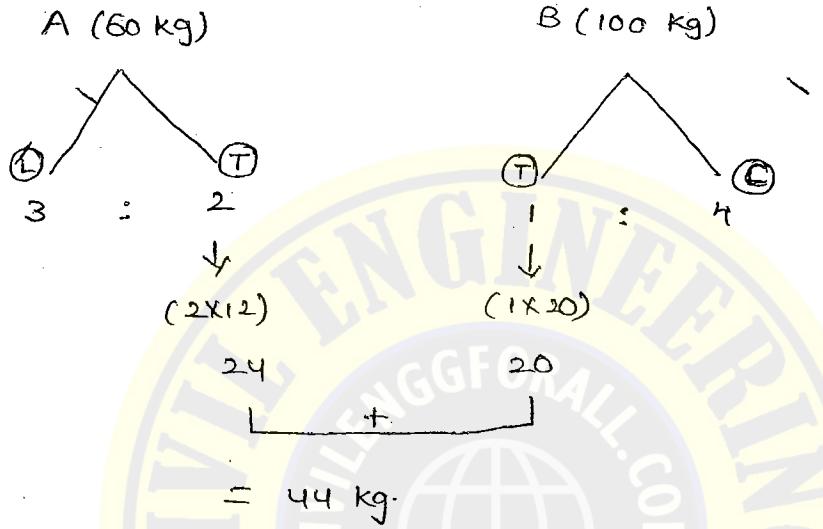
5 + 3 = 8 parts

$= \frac{16}{8} = 2$ each part

M	:	W
5	:	3
↓		
(5×2)	:	(3×2)
10 lit	:	6 lit
+4		
14 lit	:	6 lit

7 lit : 3 lit.

3.



4.

A

G	:	C
7	:	2

Total parts = 9

$\frac{7}{9} : \frac{2}{9}$

B

G	:	C
7	:	11

Total parts 18

$\frac{7}{18} : \frac{11}{18}$ (each part)

C

G	:	C
$\left(\frac{7}{9}+\frac{7}{18}\right)$	:	$\left(\frac{2}{9}+\frac{11}{18}\right)$
21	:	15
7	:	5

5. A = B + 7 = x + 8 + 7 = x + 15 = (25)

B = C + 8 = x + 8 = (18)

C = x = (10)

$x + 15 + x + 8 + x = 53$

$x = 10$

A : B : C

25 : 18 : 10

6. 25 p 10 p 5 p

1 : 2 : 3

25p 20p 15p ⟶ $\frac{15 \times 50}{5}$ = 150 No's.

60p = 30×100

1 p = 50 No's of 1 paise coins

7.

Income			expenditure		
A	:	B	A	:	B
5	:	4	3	:	2

5×800

= 4000/-

2p = 1600

p = 800

Saving = Income − expenditure

PARTNERSHIP

P·9 NO:-63

1.

A		B		C
35,000		45,000		55,000
7	:	9	:	11
(7×1500)	:	(9×1500)	:	(11×1500)
10500		15500		16500

profit = 40,500

27p = 40,500

1p = 1500

2.

yogesh		pranab		Ashok
45000×12	:	60000×9	:	90000×3
2	:	2	:	1

(1×4000)

= 4000

profit = 20,000

5p = 20,000

1p = 4000

3.

A	B	C	
40	80	120	⟶ 1st month
40	40	120	⟶ 2nd month B withdraws 40
40	40	40	⟶ 3rd month 'C' withdraws 80
120	160	280	
3	: 4	: 7	

4. Sekhar Rajeev Jatin

1999 → 25000

2000 → 35000 — 35000

2001 → 45000 — 35000 — 35000

105000 70000 35000

3 : 2 : 1

↓

2 × 25000

= 50,000

profit = 1,50,000

6p = 150000

1p = 25000

P.g No:- 64

1. A B C

16,000 × 3 12000 × 3

11000 × 9 17000 × 9 31000 × 6

147000 189000 176000

7 : 9 : 6

3p = 3 (1200)

= 3600

profit = 26,400

22p = 26400

1p = 12000

2. 2A = 3B ⇒ A : B = 3 : 2

B = 4C ⇒ B : C = 4 : 1

A : B : C = 12 : 8 : 2

6 : 4 : 1

↓

4 (1500) = 6000 Rs.

profit = 16500

11p = 16500

1p = 1500

5. A B

12000 20,000

3 : 5

A → W + I

↓

960 + 3 (1080)

= 4200

Ⓐ → 10% profit = 9600 + 960 = 8640

8p = 8640

1p = 1080

7. Investment profit

A	B	A	B
14	15	7	6
10 months	x		

$14 \times 10 \times 6 = 15 \times x \times 7$

$x = 8$ months.

AVERAGES

1. Average (A) = $\frac{\text{Sum of Quantities (S)}}{\text{No. of Quantities (N)}}$

$S = N \times A$

$N = \frac{S}{A}$

2. 1 to n, consecutive 'n' natural numbers

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

$N = n$

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

$A = \frac{n+1}{2}$

$= \frac{\text{Last no.} + 1}{2}$

$A = \frac{\text{Last no.} + \text{First no.}}{2}$

3. 1 to n, consecutive 'n' odd numbers

Eg:- 1, 3, 5, 7, 9 → Total 5 no's = n

$A = \frac{25}{5} = 5$

$\boxed{A = n}$

4. 1 to n, consecutive 'n' even numbers

Eg:- 2, 4, 6, 8, 10

$A = \frac{30}{5} = 6$

5. Any consecutive 'n' natural numbers

No. of numbers = odd

Eg:- 50, 51, (52), 53, 54

Average = 52

6. Any consecutive, 'n' natural numbers

No. of numbers = even

Eg:- 50, 51, 52, | 53, 54, 55

$A = 52.5$

7. combined or Group or weighted average

$n_1 \rightarrow x_1$

$n_2 \rightarrow x_2$

$n_3 \rightarrow x_3$

$$A = \frac{n_1x_1 + n_2x_2 + n_3x_3 + \cdots}{n_1 + n_2 + n_3 + \cdots}$$

P.9 NO:- 67

1.

Grand parents	parents	Grand children
A = 67 years	A = 35 years	A = 6 years
N = 2	N = 2	N = 3

$$A = \frac{67 \times 2 + 35 \times 2 + 6 \times 3}{2 + 2 + 3}$$

$$= 31.\frac{5}{7} \text{ years}$$

2.

Sunday	Other days
A = 510	A = 240
N = ?	N = ?

$$A = \frac{510 \times 5 + 240 \times 25}{30}$$

$= 285$

1 – sunday,
7 – days
8 – sunday$_2$
7
15 – S_3
7
22 – S_4
7
29 – S_5

3. $N=9$ A

$N=8$, 30/-

$N=1$, $(A+20)$

$$\frac{8\times30+1\times(A+20)}{9} = A$$

$$A = \frac{260}{8}$$

$$= 32.50$$

$A = 32.50$

Sum $= A \times N$

$= 32.50 \times 9$

$= 292.50$ Rs.

4. $N=16$ Avg $= 76$

A: $N=10$, $A=75$

B: $N=6$, $A=x$

$$\frac{75*10+6\times x}{16} = 76$$

$$x = 77\frac{2}{3}$$

5. $N=40$, $R=50$

Lowest score (L): $N=1$, $R=x$

$N=38$, $R=48$

(H)ighest score: $N=1$, $R=(x+172)$ $\Rightarrow$ $2+172=174$

$$\frac{1\times x + 38\times48\times1\times(x+172)}{40} = 50$$

$$x = 2$$

6. $\left(\frac{I+II}{2}\right) - \left(\frac{II+III}{2}\right) = 15$

$$\frac{I+II-II+III}{2} = 15$$

$I - III = 30$

7. 1st day : 5th day

7 : 8

$8 \times 8^\circ = 64^\circ$

1, 2, 3, 4 $\longrightarrow$ A = 58, sum = 4 × 58 = 232

2, 3, 4, 5 $\longrightarrow$ A = 60, sum = 4 × 60 = 240

$1^{st} - 5^{th} = -8$

$5^{th} - 1^{st} = 8$

8. N = 36 $\longrightarrow$ A = 17 years

Teacher $\leftarrow$ T = +1 $\longrightarrow$ A = +1

N = 37 A = 18 years

Summation of Teachers (S_T) = 37 × 18 = 666 years

Summation of students (S_S) (−) = 612 years

54 years = Teacher's age

Note :-

17 years (Aug age)

\+

37 years (Teacher added to group)

54 years

Level - 2 :-

1. 35 $\longrightarrow$ 1800

125 × 36 $\longrightarrow$ 4500

6300

3. N = 11 A

C W N = 9

N = 1 N = 1 (A − 1)

26 yrs 29 yrs

$$\frac{1 \times 26 + 1 \times 29 + 9(A-1)}{11} = A$$

A = 23 years

4. N = 45, A = 52 kg $+\frac{2}{3} = 52 - \frac{2}{3}$

(−ve) (+ve)

N = 5 N = 5

A = 48 kg A = 54 kg

$5 \times 6 = \frac{30}{45} = \frac{2}{3}$

E = D + 3 = 68 + 3 = 71

5. (A, B, C) 84 kg (ABCD) – 80 kg (B C D E) = 79 kg

A+B+C = 84×3 = 252 kg

(–) 177

A = 75 kg

A+B+C+D = 80×4 = 320 kg

(–) 252

D = 68 kg

B+C+D+E = 79×4 = 316 kg

68 71 (–) 139

B+C = 177 kg

6. N = ? A = 63

↳ G = +20

H = +2

$63 \times N + 20 + 2 = 65 \times N$

$2N = 22$

$N = 11$

N = ? A = 65

PROBLEMS ON AGES

(–ve) ⇑ P

Ago | before | previous

After | Next | Hence

P ⇓ (+ve)

	A	B
T_1	x	y
P	$x + T_1$	$y + T_1$
T_2	$x + T_1 + T_2$	$y + T_1 + T_2$

	A	B
T_1	$x - T_2 - T_1$	$y - T_2 - T_1$
(P)	$x - T_2$	$y - T_2$
T_2	x	y

P. 9 NO:-69

10.

	P	Q
P ⇒	$5x$	$7x$
	↓	↓
6 years	$5(4) = 20$	$7(4) = 28$
	$5x + 6$	

$20 + 28 = 48$ years

$7x - (5x + 6) = 2$

$2x = 8$

$x = 4$

2. Father : son

$3x : x$

4 yrs → $3(12) = 36$

P → $36 + 4 = \boxed{40 \text{ yrs}}$

4 yrs

$3x+8 : x+8$

$3x+8+x+8 = 64$

$x = 12$

4. Kunal : Sagar

$6x : 5x$

6 years

P ⇒

4 years

$\boxed{5x2} = 10+6$

$= 16$ years

$+6$

$11 : 10$

$\frac{6x+(6+4)}{5x+(6+4)} = \frac{11}{10}$

$x = 2$

Level - 2 :-

1. N : Sh

$6x : 6x$

T = ?

$\frac{5x}{3} : \frac{6x}{2} :: 5 : 9$

$\frac{5x}{3} \times 9 = \frac{6x}{2} \times 5$

$15x = 15x$

∴ cannot be determined

2. A : B

$(5x-4) : \boxed{8}$

4 years ago

4 years

P $5x : 3x$

$= 20 : 12$

4 years hence

$\boxed{24} : (3x+4)$

4 years hence

$\frac{5x-4}{3x+4} = \frac{1}{1}$

$x = 4$

$\frac{24}{8} = \frac{3}{1} = 3:1$

4.

	Father		son
6 yrs	$5x$	:	$1x$
(P)	$(5x+6)$	:	$(x+6)$

$5x+6+x+6=60$

$x=8$

$(x+6) \rightarrow 8+6=14$ yrs

$+6$ yrs

20 yrs.

TIME AND WORK

A $\rightarrow$ x days, 1 day of work $= \frac{1}{x}$

B $\rightarrow$ y days, 1 day of work $= \frac{1}{y}$

1 day $(A+B) = \frac{1}{x}+\frac{1}{y} = \frac{x+y}{xy}$ th

$$\boxed{(A+B) = \frac{xy}{x+y} \text{ days}}$$ $< x$ days, $< y$ days

$(A+B) = x$ days

$A = y$ days

$B = ?$ $\quad y > x$

$$\boxed{B = \frac{xy}{y-x} \text{ days}}$$

A $\rightarrow$ x days, 1 day $= \frac{1}{x}$

B $\rightarrow$ y days, 1 day $= \frac{1}{y}$

C $\rightarrow$ z days, 1 day $= \frac{1}{z}$

1 day $(A+B+C) = \frac{1}{x}+\frac{1}{y}+\frac{1}{z}$

$$= \frac{xy+yz+zx}{xyz} \text{ th}$$

$$\therefore (A+B+C) = \frac{xyz}{xy+yz+zx} \text{ days}$$

P.9 NO:- 70

1. Given $x = 9$ min $\quad y = 6$ min

$$\frac{xy}{x+y} = \frac{9(6)}{9+6} = 3\frac{3}{5} \text{ min}$$

2. Given

4 hrs $(P+Q+R) = 216$ pages

1 hr $(P+Q+R) = 54$ pages

1 hour : $R - Q = Q - P$

$$2Q = R + P$$

$$\boxed{Q = \frac{R+P}{2}}$$

$\boxed{5R = 7P}$ → Another condition given

$$Q = \frac{\frac{7P}{5} + P}{2}$$

$$\boxed{Q = \frac{12P}{10}}$$

$$\boxed{R = \frac{7P}{5}}$$

$$P + \frac{12P}{10} + \frac{7P}{5} = 54$$

$$P = 15 \text{ pages}$$

$$R = \frac{7(15)}{5} = 21 \text{ pages}$$

$$Q = \frac{12(15)}{10} = 18 \text{ pages}$$

$\therefore P : Q : R = 15 : 21 : 18$

3. $(A+B) = x$ hours $\Rightarrow$ For 1 hour $\rightarrow \frac{1}{x}$

$A = x+8$ hours $\Rightarrow$ for 1 hour $\rightarrow \frac{1}{x+8}$

$B = x + \frac{9}{2}$ hours $\Rightarrow$ for 1 hour $\rightarrow \frac{2}{2x+9}$

$$\frac{1}{x+8} + \frac{2}{2x+9} = \frac{1}{x}$$

$$x(2x+9+2x+16) = 2x^2 + 9x + 16x + 18$$

$$2x^2+9x+2x^2+16x = 2x^2+9x+16x+18$$

$$2x^2 = 72$$

$$x = \sqrt{36}$$

$$x = 6 \text{ hours}$$

4. P → 12 days or 96 hours, 8 hours/day, For 1 hr → $\frac{1}{96}$

Q → 8 days (or) 80 hours, 10 hours/day, For 1 hr → $\frac{1}{80}$

(P+Q) → ? , 8 hours/day, For 1 hr → $\frac{1}{x \times 8}$

$$\frac{1}{96} + \frac{1}{80} = \frac{1}{8x}$$

$$x = \frac{60}{11}$$

$$= 5\frac{5}{11}$$

11) 60 (5
55
5

5. Given $A = B+C$

$A+B = 10$ days

$C = 50$ days

$B = ?$

~~$A+B+C = 10+50 = 60$, For 1 day → $\frac{1}{60}$~~

1 day $\underset{A}{(A+B+C)} = \frac{1}{10} + \frac{1}{50} = \frac{3}{25}$

1 day $(2A) = \frac{3}{25}$

1 day $A = \frac{3}{50}$

1 day $B = \frac{1}{10} - \frac{3}{50}$

1 day $B = \frac{1}{25}$ th

$B = 25$ days

6. A → 15 days

B → 10 days

After 2 days, B had to leave

1 day $(A+B) = \frac{1}{15} + \frac{1}{10} = \frac{1}{6}$ th

2 day $(A+B) = \frac{1}{6} \times 2 = \frac{1}{3}$ th

Remaining work $= 1 - \frac{1}{3} = \frac{2}{3}$ th by A alone

$A = \frac{2}{3} \times 15 = 10$ days

$\frac{1}{3} + \frac{2}{3}$ = whole work

↓ ↓

(A+B) A alone

↓ ↓

2 days + 10 days = 12 days

Level - 2

1. Given P → 8 hours
   Q → 10 hours
   R → 12 hours

$(Q+R) = \frac{xy}{x+y} = \frac{10 \times 12}{22} = \frac{60}{11}$ hrs

$\frac{60}{11} \times \frac{23}{60} \cong 2$ hrs

@ 9 A.M, P is closed @ 11 A.M

1 hr $(P+Q+R) = \frac{1}{8} + \frac{1}{10} + \frac{1}{12}$

$= \frac{37}{120}$ th

2 hr $(P+Q+R) = \frac{37}{60}$ th

Remaining $= \frac{23}{60}$ th by (Q+R) only

∴ 9. A.M, P is closed @ 11. AM + 2hrs

= 1. P.M.

3. First ir second

No. of garments 3 : 1

Only 1 garment 1 : 3

(2) parts

× 40 × 40

= 40 days 120 days

1 G → 80 days

2 parts = 80 days

1 part = 40 days

$\frac{xy}{x+y} = \frac{40 \times 120}{160} = 30$ days

4. A B

16 days 18 days

2 : 3 → working performance is more in 'A'

3 : 2 → taking more wage A compare to B

3 × 45 = 135 Rs

5 parts = 225

1 part = 45

P·9 NO:- 72

7. 5 skilled workers = 20 days → 1 skilled worker = 20×5 = 100 days

For 1 day = $\frac{1}{100}$ th

8 semi skilled worker = 25 days → 1 semi skilled = 8×25 = 200 da

For 1 day = $\frac{1}{200}$ th

10 unskilled worker = 30 days → 1 unskilled worker = 10×30 = 30

For 1 day = $\frac{1}{300}$ th

2 skilled + 6 semi skilled + 5 Unskilled

$= 2\left(\frac{1}{100}\right) + 6\left(\frac{1}{200}\right) + 5\left(\frac{1}{300}\right)$

$= \frac{6+9+5}{300}$

$= \frac{20}{300} = \frac{1}{15}$

∴ 15 days

GROUP (or) COMBINED WORK

$$\frac{N_1 \times D_1 \times R_1 \times E_1}{W_1} = \frac{N_2 \times D_2 \times R_2 \times E_2}{W_2}$$

N_1, N_2 = NO. of workers (or) NO. of machines

D_1, D_2 = Time of work

R_1, R_2 = Rate of work of worker or machines

E_1, E_2 = Efficiencies of machines

W_1, W_2 = Amount of work

P·9 NO:- 71

5. $\frac{104 \times 30 \times 5}{\frac{2}{5}} = \frac{N_2 \times 26 \times 9}{\frac{83}{5}}$

$N_2 = 160$

∴ 160 − 104

= 56 days

56 days
104 mens, 8 hrs/da
30 days

6. $\frac{2 \times 8 \times 12 \times 90}{9000} = \frac{3 \times 6 \times R_2 \times 80}{12000}$

$R_2 = 16$ hrs/day

PIPES AND CISTERNS

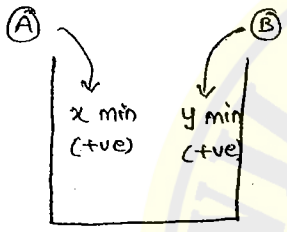
pipes :/ → taps → capacity → $\frac{m^3}{\text{sec (or) min (or) hour}}$

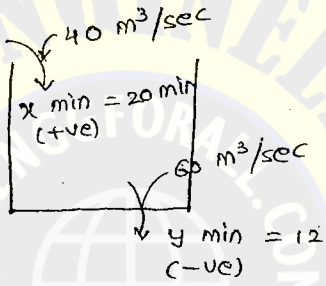
cistern : → volume (m^3)

pipes — inlet pipe → into the tank (+ve)

pipes — outlet pipe → From the tank (−ve)

/ Leakages → (−ve)





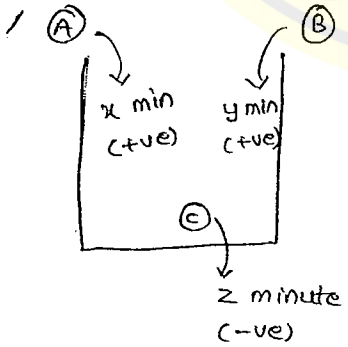
⇒ so it is empty

/ $\frac{xy}{x+y}$ min < x minutes, y minutes

$\frac{xy}{x-y}$ min > x minute, y minute

Functioning → $F \propto \frac{1}{t} \propto$ capacity

(t → time)



$1 \text{ minute} = \frac{1}{x} + \frac{1}{y} - \frac{1}{z}$

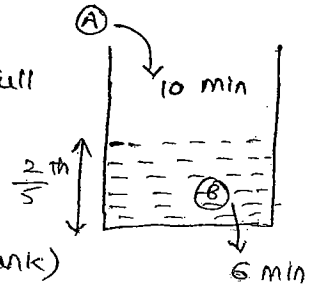
P. 9 NO:- 73

/

1. $\frac{xy}{x-y} = \frac{10 \times 6}{10-6} = 15$ min to empty of full tank

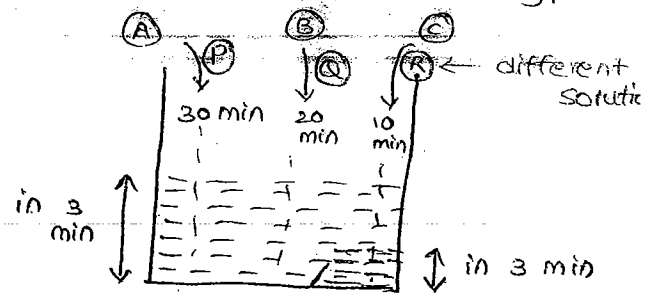
⇒ $\frac{2}{5} \times 15$

⇒ 6 m to empty the ($\frac{2}{5}$ th of tank)



Note :- 10 min to full, 6 min to empty. so if the tank is

2. After 3 min = $\frac{R}{\text{Total}}$



1 min (A+B+C) = $\frac{1}{30} + \frac{1}{20} + \frac{1}{10}$

$= \frac{11}{60}$ th

3 min (A+B+C) = $\frac{11}{60} \times 3$

$= \frac{11}{20}$ th

1 min, R $\longrightarrow \frac{1}{10}$

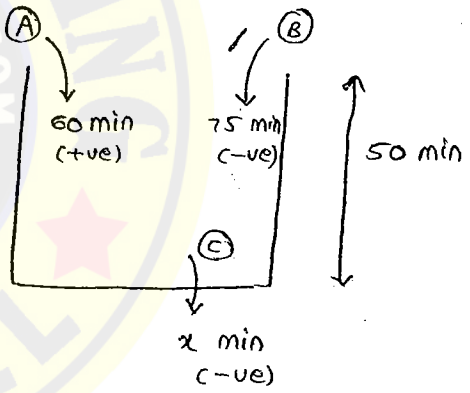
3 min, R $\longrightarrow \frac{3}{10}$

$\therefore$ After 3 min = $\frac{R}{T} = \frac{\frac{3}{10}}{\frac{11}{20}}$

$= \frac{3}{10} \times \frac{20}{11} = \frac{6}{11}$

3. 1 min (A+B−C) = $\frac{1}{60} + \frac{1}{75} - \frac{1}{x} = \frac{1}{50}$

$x = 100$ min

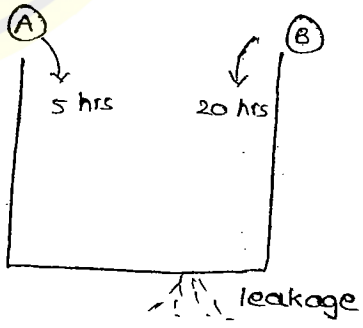


4. $\frac{xy}{x+y} = \frac{5 \times 20}{25} = 4$ hours

due to leakage = $4 + \frac{1}{2} = \frac{9}{2}$ hrs

1 hour $\longrightarrow \frac{1}{5} + \frac{1}{20} - \frac{1}{x} = \frac{2}{9}$

$x = 36$ hours



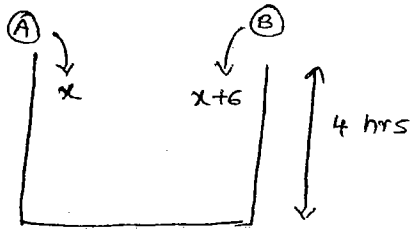
Level - 2

1. 1 hour $\longrightarrow \frac{1}{x} + \frac{1}{x+6} = \frac{1}{4}$

$\frac{x+6+x}{x^2+6x} = \frac{1}{4}$

$x = 6, -4$

$\therefore$ 6 hours to fill A alone

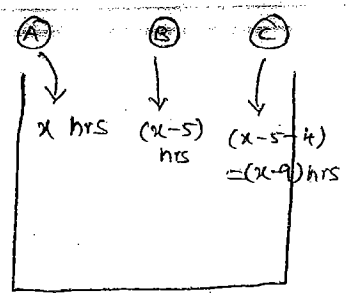


A + B = C

2. 1 hour = $\frac{1}{x} + \frac{1}{x-5} = \frac{1}{x-9}$

capacity $\propto \frac{1}{t}$

$\therefore C \propto \frac{1}{t}$



$$\frac{x-5+x}{x^2-5x} = \frac{1}{x-9}$$

$$x^2 - 18x + 45 = 0$$

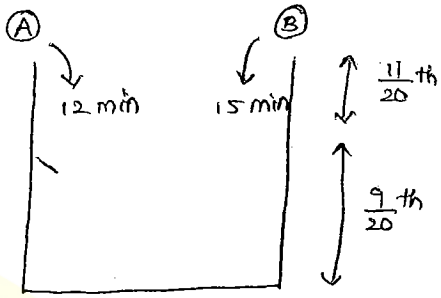
$$x = +15, \quad +3$$

$\therefore$ 15 hours

3. 1 min (A+B) = $\frac{1}{12} + \frac{1}{15} = \frac{3}{20}$ th

3 min (A+B) = $\frac{3}{20} \times 3$

$= \frac{9}{20}$ th



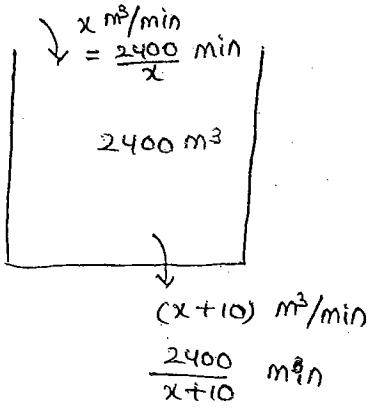
$B = \frac{11}{20} \times 15$

B = 8 min 15 sec

4. 1 hr (A+B-C) = $\frac{1}{15} + \frac{1}{20} - \frac{1}{25}$

=

5. capacity $\propto \frac{1}{\text{time}}$



$$\frac{2400}{x} - \frac{2400}{(x+10)} = 8$$

$$x^2 + 10x - 3000 = 0$$

$x = -60, \quad 50 \ m^3/min$

$\frac{2400}{x+10} = \frac{2400}{50+10} = 40$ min

$\frac{2400}{x} = \frac{2400}{50} = 48$ min

} difference is 8 min, which is satisfied

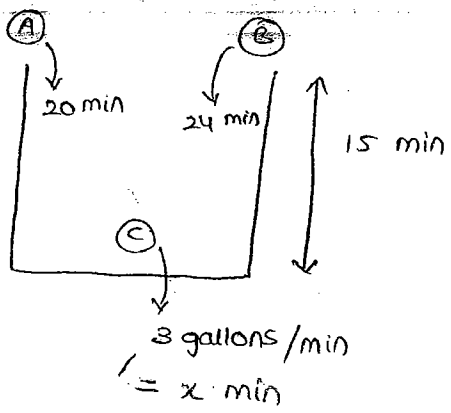
$\therefore x = 50 \ m^3/min$

6. $1 \text{ min } (A+B-C) = \frac{1}{20} + \frac{1}{24} - \frac{1}{x}$ ⇒

$$\frac{1}{15} = \frac{1}{20} + \frac{1}{24} - \frac{1}{x}$$

$$x = 40 \text{ min}$$

capacity = $3 \times 40 = 120$ gallons



TIME, SPEED AND DISTANCES

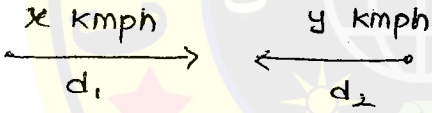
1. Speed (s) = $\frac{\text{Distance (d)}}{\text{Time (t)}}$

2. Distance is constant

$$\boxed{s \propto \frac{1}{t}}$$

$$s_1 t_1 = s_2 t_2$$

Average speed :-



$$t_1 = \frac{d_1}{x} \qquad t_2 = \frac{d_2}{y}$$

Average ~~Total~~ speed = $\frac{\text{Total distance}}{\text{Total time}}$

$$= \frac{d_1 + d_2}{t_1 + t_2}$$

$$= \frac{d_1 + d_2}{\frac{d_1}{x} + \frac{d_2}{y}}$$

$$= \frac{xy(d_1 + d_2)}{d_1 y + d_2 x}$$

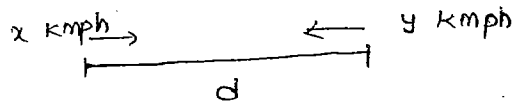
$\therefore d_1 = d_2 = d$

$$= \frac{xy(d+d)}{dy + dx}$$

$$\boxed{\text{Average speed} = \frac{2xy}{x+y} \text{ kmph}}$$

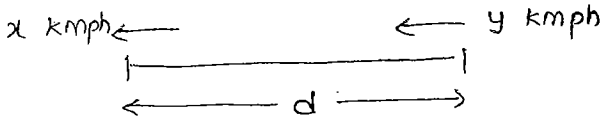
Relative speeds :-

1. In opposite directions :-



Relative speed = (x+y) kmph

2. In same direction :-



Relative speed = (y-x) kmph

3. Time is constant :-

$$S \propto d$$
$$S_1 d_2 = S_2 d_1$$

4. Speed is constant :-

$$d \propto t$$
$$d_1 t_2 = d_2 t_1$$

5. Units :-

Speed / kmph = $\frac{1000}{60\times60}$ m/s = $\frac{5}{18}$ m/s

Speed \ mphs = $\frac{18}{5}$ kmph

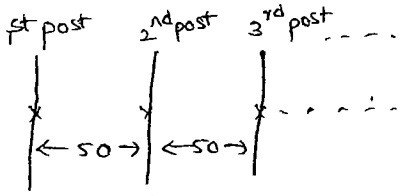
P.g No:- 75

1. speed = $\frac{\text{distance}}{\text{time}}$

distance = (20 × 50) = 1000 m = 1 km

time = 1 min = 1 × $\frac{1}{60}$ hr

$\therefore$ speed = $\frac{1 \text{ km}}{\frac{1}{60} \text{ hr}}$ = 60 km/hr



In 3 post → two 50's are coming

like that

21 post → 20 (50's) are coming

2. $S_c = \frac{d}{t}$, $S_j = \frac{d/2}{2t}$

$$\frac{S_j}{S_c} = \frac{d}{4t} \times \frac{t}{d} = 1 : 4$$

3. $\text{Speed} = \frac{\text{distance}}{t}$

$\text{distance} = \text{speed} \times t$

$= 80 \times (2\text{hr } \frac{15}{60})$

$= 80 \times 2.25$

$= 180 \text{ km}$

2 hr 15 min

80 kmph → ← 60 kmph

← 180 → | ← 170 →

B A

← 350 km →

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

$= \frac{170}{60}$

$= 2.83 \text{ hrs} \Rightarrow (2 + 0.83 \text{ hrs})$

$= 2 \text{ hours } 50 \text{ min}$

0.83×60 ↓ min

$= 49.8 \text{ min}$

5. Average speed $= \frac{2xy}{x+y}$

$= \frac{2\left(\frac{5x}{4}\right)(x)}{\frac{5x}{4} + x} = \frac{800}{16}$

$x = 5 \times 9 = 45 \text{ kmph}$

$\therefore \frac{5x}{4} = \frac{5 \times 45}{4} = 56.25 \text{ kmph}.$

25% of x → $\frac{5x}{4}$ →

← 800 km →

← x kmph

25% of $x = \frac{25}{100} \times x = \frac{x}{4}$

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

P.9 NO:- 76

1. (A) → 1 hr → 50 kmph → $(50 \times 1) = 50$ km

(B) → 2 hrs → 48 kmph → $(2 \times 48) = 96$ km

(C) → 3 hrs → 52 kmph → $(52 \times 3) = 156$ km

$\text{Mean speed} = \frac{\text{Total distance}}{\text{Total time}}$

$= \frac{50 + 96 + 156}{6}$

$= 50\frac{1}{3} \text{ kmph}$

9. 6 km → $1\frac{1}{2}$ kmph → $\frac{6}{3/2} = 4$ hrs

8 km → 2 kmph → $\frac{8}{2} = 4$ hrs

32 km → 8 kmph → $\frac{32}{8} = 4$ hrs

$\frac{d}{s} = t$

Avg. speed $= \frac{\text{Total distance}}{} = \frac{6+8+32}{} = 3\frac{5}{6} \text{ kmph}$

3. $t_1 = \frac{715}{s}$ $\quad t_2 = \frac{715}{s+10}$

$(s+10) \longrightarrow$ } 2hrs (less)
$s \longrightarrow$ }

$\longleftarrow$ 715 KM $\longrightarrow$

$t_1 - t_2 = 2\text{hrs}$

$\frac{715}{s} - \frac{715}{s+10} = 2\text{hrs}$

$715\left[\frac{s+10-s}{s^2+10s}\right] = 2\text{hrs}$

$2s^2 + 20s - 7150 = 0$

$= \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$s \simeq 55$ km/hr

$\frac{\text{product of speed}}{d} = \frac{\text{D/f of speed}}{\text{D/f of time}}$

(or) $\frac{s(s+10)}{715} = \frac{10}{2}$

$2s^2 + 20s - 7150 = 0$

11. 4 km/hr

3 km/hr

3 kmph $\longrightarrow$ } $\frac{1}{2}$ hr
4 $\longrightarrow$ }

$\longleftarrow$ d = ? $\longrightarrow$

$\frac{\text{product of speed}}{d} = \frac{\text{Difference of speed}}{\text{D/f of time}}$

$4-3=1$

$\frac{3\times4}{d} = \frac{1}{1/2}$

$d = 6\text{hrs}$

12. $\frac{20\times30}{d} = \frac{10 \text{ hrs}}{4} \rightarrow (30-20)$

$1\frac{1}{2}$ { 30 kmph $\longrightarrow$ } $2\frac{1}{2} = \frac{3}{2} + \frac{5}{2} = 4\text{hrs}$
20 kmph $\longrightarrow$ }

A $\longleftarrow$ d = ? $\longrightarrow$ B

$d = 240$ km

2.

$\frac{s(s+10)}{d} = \frac{10}{1}$

$10d = s^2 + 10s \longrightarrow (1)$

$1 + \frac{3}{4} = \frac{7}{4}$ hr { $(s+20) \longrightarrow$ } 45 min $= \frac{3}{4}$ hr (less)
$(s+10) \longrightarrow$ } 1 hr (less)
$s \longrightarrow$ }

$\longleftarrow$ d $\longrightarrow$

$\frac{s(s+20)}{d} = \frac{20}{7/4}$

$20d = \frac{7}{4}s^2 + 35s \longrightarrow (2)$

Solve (1) & (2)

$20d = \frac{7}{4}s^2 + 35s$

$20d = 2s^2 + 20s$

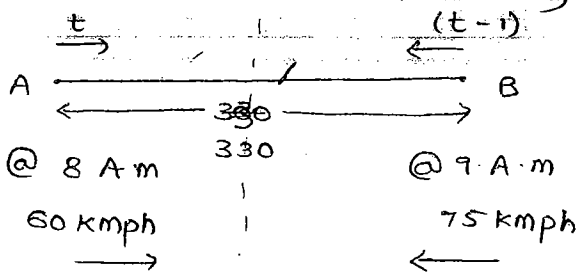
$2s^2 + 15s = 0 \Rightarrow s = 60$ km

5. $60 \times t + 75 \times (t-1) = 330$

$135t = 405$

$t = 3$ hrs

@ $8 + 3 = 11$ A.M.



6.

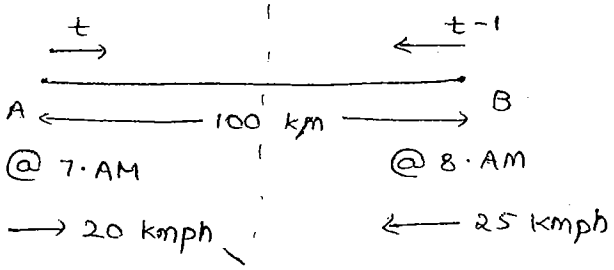
$20 \times t + 25(t-1) = 100$

$20t + 25t - 25 = 100$

$45t = 75$

$t = 2$ hrs 47 min

@ 7 + 2 hr 47 min = 9 : 47 AM



7. ~~$d = \frac{t}{s}$~~ $t = \frac{d}{s}$

$\frac{x}{50} = \frac{x+120}{60}$

$60x - 50x = 120 \times 50$

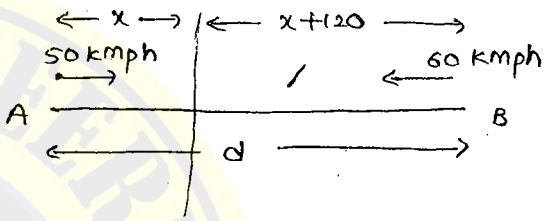
$10x = 120 \times 50$

$x = 12 \times 50$

$x = 600$ km

$x + 120 = 600 + 120 = 720$ km

$d = 600 + 720 = 1320$ km



(or)

A	:	B
5Ø		6Ø

1 P = 120

11 P = 1320 km.

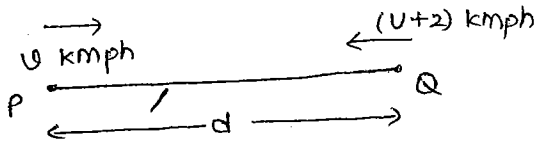
8.

M	:	P
6Ø		4Ø
~~6~~	:	~~4~~
3	:	2

(3 − 2) = 1 P = 20 km

(3 + 2) = 5 P = 100 km

14. In opposite direction



$R_s = v + v + 2 = 2v + 2$

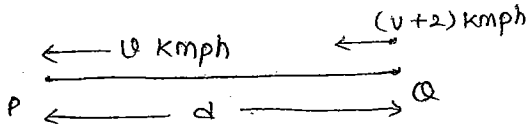
$\frac{d}{2v+2} = \frac{72}{60}$

$5d = 12v + 12$

$\therefore 5(12) = 12v + 12$

$v = 48$ kmph

In same direction



Relative speed $= v + 2 - v = 2$ kmph

$\frac{d}{2} = 6$

$d = 12$ km

Problems on Trains

1. Speed of the train $= \frac{\text{distance (d)} + \text{length of the train (LT)}}{\text{Time (T)}}$

$$\boxed{ST = \frac{d + LT}{T}}$$

15. Given $ST = 132 \text{ kmph} \times \frac{5}{18} = \frac{110}{3}$ m/sec

$LT = 110$ m

$D = 165$ m

$T = ?$

$\frac{110}{3} = \frac{165 + 110}{T}$

$T = 7.5$ sec

16. Given

23 sec $\longrightarrow$ 272 m

19 sec $\longrightarrow$ 200 m

speed is constant

$\frac{272 + LT}{23} = \frac{200 + LT}{19}$

$LT = 142$ m

23 sec $\longrightarrow$ 272 m

19 sec $\longrightarrow$ 200 m

(or)

4 sec $\longrightarrow$ 72 m

1 sec $\longrightarrow$ 18 m

23 sec $\longrightarrow 23 \times 18 = 414$

19 sec $\longrightarrow 19 \times 18 = 342$

$LT = 414 - d \Rightarrow 414 - 272 = 142$ m

$LT = 342 - d \Rightarrow 342 - 200 = 142$ m

MIXTURE AND ALLIGATION

Mixture → combined

Alligation → Rule

The quantity of cheaper quality = x kg

The quantity of superior quality = y kg

The cost price of cheaper quality per kg = c

The cost price of superior quality per kg = d

The total cost price of cheaper quality = cx

The total cost price of superior quality = dy

The total cost price of the mixture = cx+dy

The cost price of mixture per kg = $\frac{cx+dy}{x+y}$ = m = mean cost price

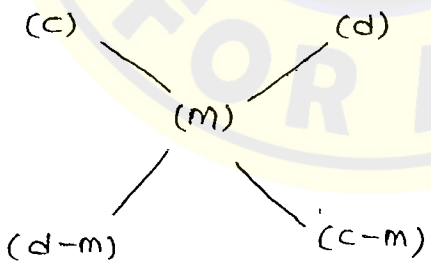
$$\frac{cx+dy}{x+y} = m$$

$$cx+dy = mx+my$$

$$dy-my = mx-cx$$

$$y(d-m) = x(m-c)$$

$$\boxed{\frac{y}{x} = \frac{(m-c)}{(d-m)}}$$

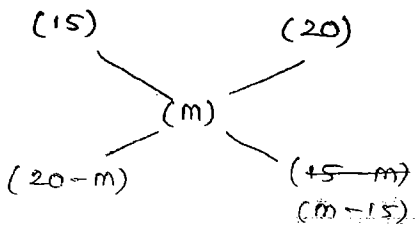


P. 9 NO:- 78

1. Type - 1 Type - 2

Rs. 15 Rs. 20

2 : 3



$\frac{(m-15)}{(20-m)} = \frac{3}{2}$ (relevant to superior)

m = 18

2. ? → 9/-

27 kg → 7/-

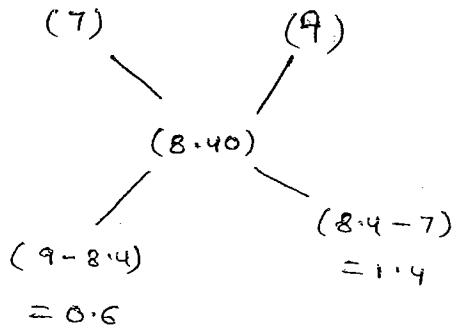
gain = 10%

S.P = 9.24 Rs

$\frac{S.P - C.P}{C.P} \times 100 = Gain$

$C.P = \frac{100}{110} \times 9.24$

$= 8.40$

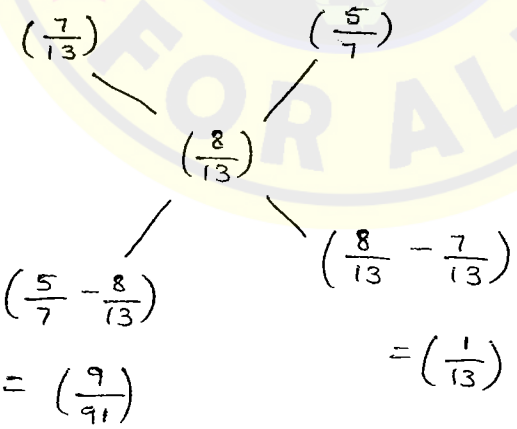


$\frac{1.40}{0.6} = \frac{y}{27}$ (based on superior cost)

$y = 63$ kg

3.

A		B		C	
S	W	S	W	S	W
5	: 2	7	: 6	8	: 5
$\frac{5}{7=(5+2)}$		$\frac{7}{13}$		$\left(\frac{8}{13}\right)$	
$= 0.714$		$= 0.538$		$=$	

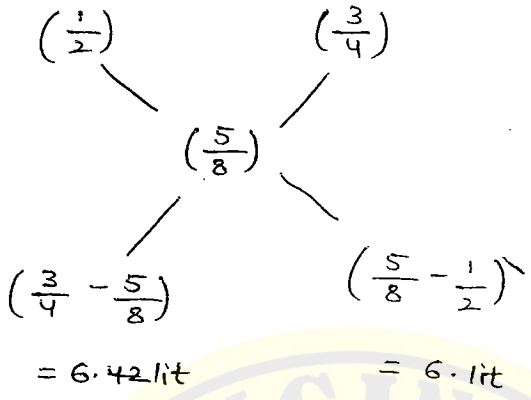


$\frac{\frac{1}{13}}{\left(\frac{9}{91}\right)} \Rightarrow \frac{7}{9} \Rightarrow 7:9$

Level - 2 :-

1.

1st		2nd		W/ : M
M	W	M	W	
$\frac{3}{4}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	3 : 5

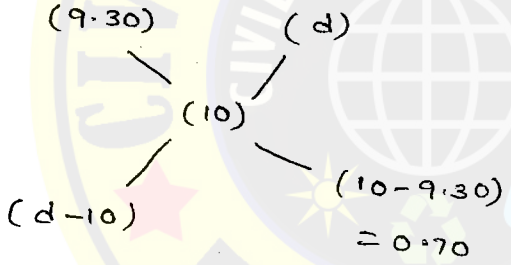


$= 6.42$ lit $= 6.1$ lit

2.

9.30 /- ? Mixture = 10 Rs.

8 : 7



$\frac{0.7}{d-10} = \frac{7}{8}$

$d = 10.80$

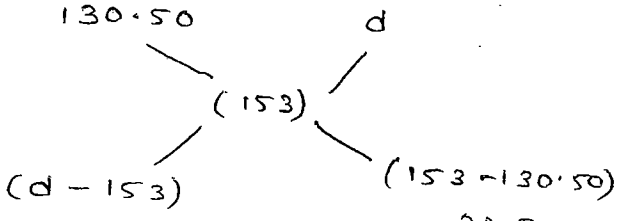
3.

126 Rs 135 Rs x Mixture = 153 Rs.

1 : 1 : 2 ₹ ₹

$\frac{126 \times 1 + 135 \times 1}{2}$

$= 130.50$



$\frac{22.50}{d-153} = \frac{2}{2} = 1 \Rightarrow d = 175.50$

Replacement of pure liquid:-

The amount of purely ~~fit~~ liquid = x lit

The amount of replaced liquid = a lit

No. of operations = n (taken out + fill it)

The amount of pure liquid remained = $x\left(1-\frac{a}{x}\right)^n$

P.g No:- 78

4. Given $x = 40$ lit, $a = 4$, $n = 3$

$$x\left(1-\frac{a}{x}\right)^n$$

$$40\left(1-\frac{4}{40}\right)^3$$

$$= 29.16 \text{ lit.}$$

5. Given $x = ?$ $n = 4$ $a = 8$ lit

16 : 65

$$\frac{x\left(1-\frac{a}{x}\right)^n}{x} = \frac{16}{81} = \left(\frac{2}{3}\right)^4$$

(16+65)

$$1-\frac{8}{x} = \frac{2}{3}$$

$$1-\frac{2}{3} = \frac{8}{x}$$

$$\frac{1}{3} = \frac{8}{x}$$

$$x = 24 \text{ lit.}$$

PERCENTAGE

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

10% of $x = \frac{10x}{100} = \frac{x}{10}$

$10\% \uparrow = x + \frac{x}{10} = \frac{11x}{10}$

$10\% \uparrow = \frac{110x}{100}$

$10\% \downarrow = \frac{90}{100}$

20% of $x = \frac{20x}{100} = \frac{x}{5}$

Remaining $= x - \frac{x}{5}$

$= \frac{4x}{5}$

$= 80\%$

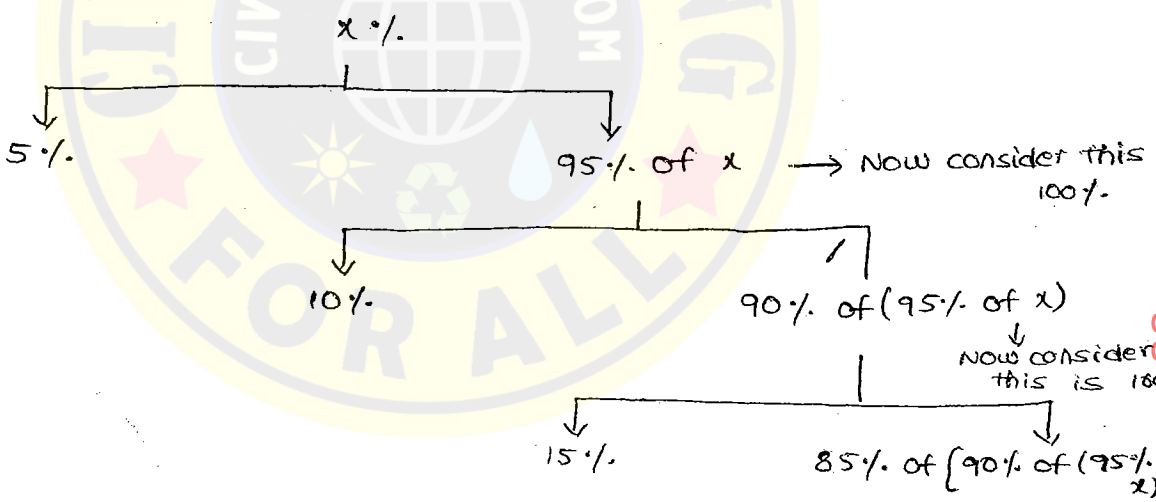
$R = \frac{80}{100} \times x = \frac{4x}{5}$

(A), 5% 10% 15% 20% Remaining = ?

$A \times \frac{95}{100} \times \frac{90}{100} \times \frac{85}{100} \times \frac{80}{100} = \text{Remaining } (R)$

$R \times \frac{100}{95} \times \frac{100}{90} \times \frac{100}{85} \times \frac{100}{80} = \text{Actual } (A)$

$A > R$



P.9 No:- 80

1. A → 6 %.

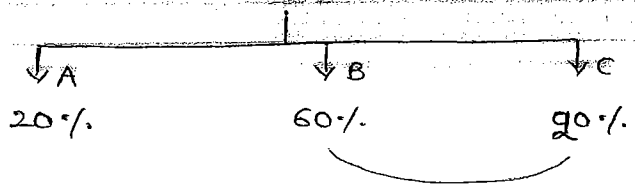
   B → 7 %.

   1 % = 80 mem

   100 % = 100 × 80

   = 8000 members.

2.



40% = 720

1% = 18

100% = 100 × 18

= 1800

3.

100% votes = 7500

55% of valid votes

45% of valid votes

$\frac{45}{100} \times 7500 \times \frac{80}{100}$ 20% are invalid votes

= 2700

4.

100% votes

54% of valid votes

46% of valid votes

8% of valid = 1620

$\frac{8}{100} \times \overset{x}{\cancel{1620}} \times \frac{90}{100} \times \frac{90}{100} = 1620$

$x = \frac{1620 \times 100 \times 100 \times 100}{90 \times 90 \times 8}$

= 25000

5.

100% votes

A

30%

B

70%

60% of 70%

40% of 70%

$= \frac{40}{100} \times \frac{70}{100}$

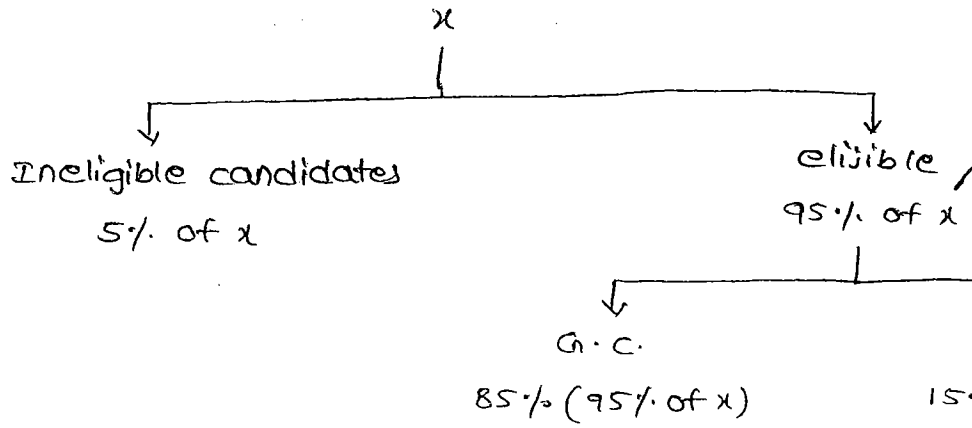
$= \frac{28}{100}$

= 28%

2% = 1200

P.9 NO:- 81

1.



$\frac{15}{100} \times \frac{95}{100} \times x = 4275$

$x = 30,000$

2. He spent 30%, 40%, 50% of 18,400

actual amount $\longrightarrow 18400 \times \frac{70}{100} \times \frac{60}{100} \times \frac{50}{100} \longrightarrow$ Remaining amount

$= 3864 \leftarrow$ saving amount.

3. He spent 10%, 15% 10%.

Remaining = 1,377

$1,377 \times \frac{100}{90} \times \frac{100}{85} \times \frac{100}{90}$

Actual = 2000

5.

2000	2001
Investment = x	Investment = (x − 5000)
profit = 20% ↑	profit = 26% ↑

Income = Income

$\frac{120}{100} x = \frac{126}{100} (x - 5000)$

$x = 1,05,000$

7. $10,000 \times \frac{110}{100} \times \frac{80}{100} \times \frac{130}{100}$

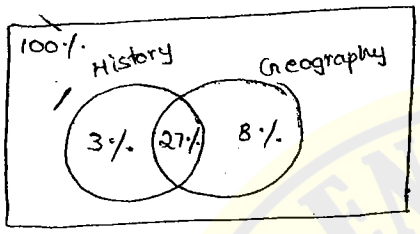
$= 11,440.$

9.

1000 Rs	1000 Rs
20%. 10%.	15%. 15%.
$1000 \times \frac{80}{100} \times \frac{90}{100}$	$1000 \times \frac{85}{100} \times \frac{85}{100}$
$= 720$	$= 722.5$
Discount $= 1000 - 720$	Discount $= 1000 - 722.5$
$= 280$	$= 277.50$

2.50

10.



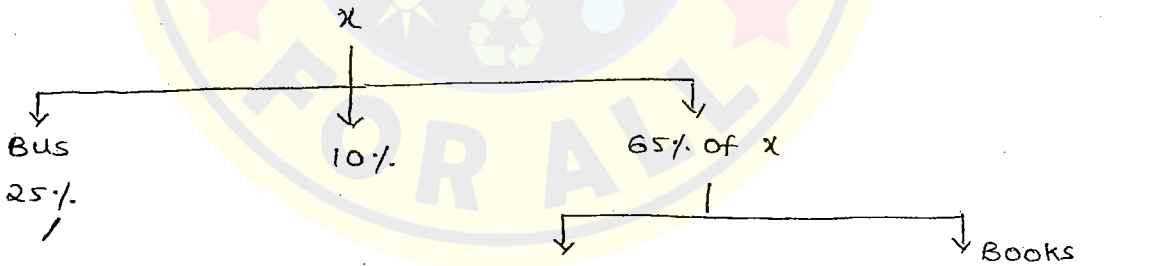
passed $= 100\% - (3\% + 27\% + 8\%)$

$= 62\% \longrightarrow 248$

$1\% \longrightarrow 4$

$100\% \longrightarrow 400$

11.



$\frac{50}{100} \times \frac{65}{100} \times x = 26$

$x = 80$ Rs.

12. 1 : 2 : 2

50%. 60%. 65%.

$\frac{1 \times 50 + 2 \times 60 + 2 \times 65}{5} = 60\%.$

15. $\left(x - \frac{15}{100}x\right) = 25$ kg

$\frac{17x}{20} = 25$

$x = 29.414$

$= 30$ kg

No. of cans $= \frac{30}{2} = 15$

Cost $= 16 \times 15 = 240$

20)

S	D	Total
20	40 (24-4 = 20 nds)	60
20% of 20 = 4 < 25 yr old	= 50% < 25 yr old	40% of 60 = 24 < 25 yr old

19. $t + s = 95 \rightarrow (1)$

$0.9t + 1.2s = 90 \rightarrow (2)$

$1.2t + 1.2s = 114 \rightarrow (1) \times 1.2$

$-0.3t = -24$

$t = 80$ Rs/-

PROFIT, LOSS AND DISCOUNT

1. CP > SP = Loss

Loss = CP − SP

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

CP = cost price
SP = selling price

2. CP < SP = profit

profit = S.P − CP

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

3. L% P% SP

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

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

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

4. L% P% CP

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

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

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

p.g NO:- 83

1. $CP = 120 \times 80 + 280 + 0.4 \times 170 + 72$

$= 10,000$

profit = 8%.

SP = ?

$SP = \frac{108}{100} \times 10,000 = 10,800$

SP per ream $= \frac{10800}{170} = 90$

2. Given 2000 No's

$\frac{95}{100} \times 2000 = 1900$

$S.P = 1900 \times 25 = 47,500$

profit = 25%.

$CP = \frac{100}{125} \times 47500$

$= 38,000$

passed = 1000

$SP = 1000 \times 25 = 25,000$

Loss = 38000 - 25000

$= 13000$

3. SP = 1920

profit = ?

SP = 1280

Loss = ?

$\frac{SP - CP}{CP} \times 100 = \frac{CP - SP}{CP} \times 100$

$1920 - CP = CP - 1280$

$2CP = 3200$

$CP = 1600$

profit = 25%.

SP = ?

$SP = \frac{125}{100} \times 1600$

$= 2000$

4. S.P = 177 per kg

profit = 18%.

2 kg | 200 Per kg

3kg | ?

= 5 kg

Total $S.P = 5 \times 177 = 885$

$CP = \frac{100}{118} \times 885$

$= 750$

$2 \times 200 + 3 \times x = 750$

$x = 116.67$ per kg

Level - 2

1. $\frac{12000 \times 1 \times 10}{100} + \frac{x \times 1 \times 20}{100} = \frac{(12000+x) \times 1 \times 14}{100}$

$x = 8000$

Total $= 12000 + 8000$

$= 20,000$

4.

$\frac{P}{3}$ — 7%

$\frac{P}{4}$ — 8%

$\frac{5P}{12}$ — 10%

$P - \left(\frac{P}{3} + \frac{P}{4}\right) = \frac{5P}{12}$

$I =$ Rs. 561

$\frac{\frac{P}{3} \times 1 \times 7}{100} + \frac{\frac{P}{4} \times 1 \times 8}{100} + \frac{\frac{5P}{12} \times 1 \times 10}{100} = 561$

$P = 6600$

COMPOUND INTEREST

Yearly :-

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

$A = P + RC$

$C = A - P$

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

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

Half yearly :-

$A = P\left(1 + \frac{R/2}{100}\right)^n$

$C = P\left[\left(1 + \frac{R}{200}\right)^{2n} - 1\right]$

Quaterly :-

$A = P\left(1 + \frac{R/4}{100}\right)^n$

$C = P\left[\left(1 + \frac{R}{400}\right)^{4n} - 1\right]$

P.9 NO:- 87

3. Given $n = 2$ years $\quad R = 12\frac{1}{2} = \frac{25}{2}\%$ $\quad C = 510$

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

$$510 = P\left[\left(1+\frac{12.5}{100}\right)^2 - 1\right]$$

$$P = 1920$$

$$R = \frac{25}{2}\%$$

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

$$I = ?$$

$$I = \frac{PTR}{100} = \frac{1920 \times 2 \times 12.5}{100} = 480 \text{ RS.}$$

4.

27000 , C = 4818.30 RS.

(A)	(B)
$R = 8\%$	$R = 9\%$
$n = 2$ yrs	$n = 2$ yrs
$P = x$	$P = (27000 - x)$

$$x\left[\left(1+\frac{8}{100}\right)^2 - 1\right] + (27000 - x)\left[\left(1+\frac{9}{100}\right)^2 - 1\right] = 4818.30$$

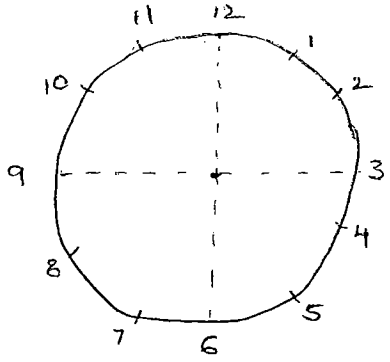
$$x = 12000$$

5.

$$A = 12500\left(1+\frac{20}{100}\right)^3 - \left[2000 + 2000\left(1+\frac{20}{100}\right)^1 + 2000\left(1+\frac{20}{100}\right)^2\right]$$

$$= 14520$$

CLOCKS



60 min = 360°

1 min = 6°

12 hours = 360°

1 hour = 30°

60 min = 30°

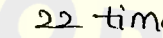
1 min = $\frac{1}{2}$°

The difference between minutes and hours are

$= 6 - \frac{1}{2} = 5\frac{1}{2}° = \frac{11}{2}°$

1. In a clock of 12 hours the minutes hand and hours hand are coincide into each other. the angle between them is 0° is in 11 times.

2. In a clock of 12 hours the minutes hand and hours hand are in opposite direction i.e., the angle between them is 180° is in 11 times



3. In a clock of 12 hours the minutes hand and hours hand are pendicular to each other that is the angle between them is 90° is in 22 times.

4. $\boxed{\theta = \frac{11}{2}m - 30h}$, if $\frac{11}{2}m > 30h$

θ = the angle between the minute hand and hour hand

m = minutes

h = hours

$\boxed{\theta = 30h - \frac{11}{2}m}$, if $\frac{11}{2}m < 30h$

Ex:- What is the angle between minutes and hours hand of a clock at 4 hr 30m.

A. $\theta = \frac{11}{2}m - 30h$

$= \frac{11}{2}(30) - 30(4)$

$= 165 - 120$

$= 45^\circ$

Ex:- What is the angle between the two hands of a clock when the clock shows 3 hours 25 minutes

A. $\theta = \frac{11}{2}m - 30h$

$= \frac{11}{2}(25) - 30(3)$

$\theta = 47\frac{1}{2}^\circ$

Ex:- At what time between 6 and 7 o'c are the hands of a clock together.

A. $\theta = \frac{11}{2}m - 30h$

@ Both hands together (coincides) means $\theta = 0^\circ$

$0 = \frac{11}{2}m - 30(6)$

$m = 32\frac{8}{11}$

$\therefore$ @ 6 hours $32\frac{8}{11}$ min both hands are coincide.

Ex:- A what time between 3 and 4 o'c are the hands of a clock in the opposite direction

A. Opposite direction, $\theta = 180^\circ$

$\theta = \frac{11}{2}m - 30h$

$180^\circ = \frac{11}{2}m - 30(3)$

$m = 49\frac{1}{11}$

@ 3 hours $49\frac{1}{11}$ min.

P.9 NO:-95

5. $x \longrightarrow$ below poverty line

38% of $x = 12160$

$x = 32000$

$x = 16\% = 32000$

$1\% = 2000$

$S = 11\% = ?$

$11\% = 22000$

6.

I		II
46% of 21%	:	42% of 11%
$\frac{46}{100} \times \frac{21}{100}$	:	$\frac{42}{100} \times \frac{11}{100}$
23	:	11

7. $R = 16\% = 32000$

$1\% = 2000$

$y = 15\% = ?$

$y = 15 \times 2000 = 30000$

$\downarrow$

below poverty

50% of $x = 30000$

$x = \frac{30000 \times 100}{50}$

$x = 15600$

8. $y = 15\% = 30000 \longrightarrow 2007$

$1\% = 2000$

$V = 10\% = 10 \times 2000 = 20000 \longrightarrow 2007$

$V = 10\% \uparrow = \frac{11.0}{100} \times 20000 = 22000 \longrightarrow 2008$

$\downarrow$

58% of $x = 22000$

$x = 12760$

9. R : Z

10% ↑ : 5% ↓

51% of 16% : 42% of 11%

$\frac{110}{100} \times \frac{51}{100} \times \frac{16}{100}$: $\frac{95}{100} \times \frac{42}{100} \times \frac{11}{100}$

2 : 1

1. $CP = 40 \times N + 3000$

$SP = 60 \times N$

profit = 1000/-

$SP - CP$ = profit

$60N - (40N + 3000) = 1000$

$N = 200$

2. $A \xrightarrow{20\%\uparrow} B \xrightarrow{10\%\downarrow} C \xrightarrow{10\%\uparrow}$

$R = 110$ $SP = 1188$

$$CP = \frac{100}{120} \times \frac{100}{90} \times \frac{100}{110} \times 1188$$

$CP = 1000$

price = 1000 − Repairs

= 1000 − 110

= 890 Rs.

5. $$1400 \times \frac{80}{100} \times \frac{90}{100}$$

$= 1008$

6. R.S. 650

profit = 20% ↑ Loss = 25% ↑

SP = SP

$CP = x$ $CP = (650 - x)$

$$\frac{120}{100} \times x = \frac{75}{100} \times (650 - x)$$

$x = 250$

$CP = 650 - 250$

$= 400$

3. $M \xrightarrow{18\%\uparrow} W \xrightarrow{20\%\uparrow} R \xrightarrow{25\%\uparrow} C$

$SP = 30.09$

$$CP = \frac{100}{118} \times \frac{100}{120} \times \frac{100}{125} \times 30.09$$

$= 17/-$

7. $CP = 150 \times 250 + 2500 = 40{,}000$

$$SP = 320 \times \frac{95}{100} = 304$$

$SP = 304 \times 150 = 45{,}600$

$$\text{profit (\%)} = \frac{SP - CP}{CP} \times 100$$

$$= \frac{45600 - 40000}{40000} \times 100$$

$= 14\%$

5-1-2014

SIMPLE INTEREST (I)

$$I = \frac{PTR}{100}$$

Amount (A) = P + I

P.9 No:- 86

1. Given P = 800 T = 3 years, A = 956, R = ?

$$A = P + I$$

$$I = A - P = 156$$

$$I = \frac{PTR}{100}$$

$$156 = \frac{800 \times 3 \times R}{100}$$

$$R = 6.5\%$$

$$R = 6.5 + 4 = 10.5\%$$

$$I = \frac{800 \times 3 \times 10.5}{100}$$

$$= 252$$

$$A = P + I = 800 + 252$$

$$= 1052$$

2. Given I = 600 P = ? R = ?

T = 10 yrs — 5 yrs → P, 5 yrs → 3P

$$I = \frac{P \times 5 \times \frac{6000}{P}}{100} + \frac{3P \times 5 \times \frac{6000}{P}}{100}$$

$$= 300 + 900$$

$$I = 1200$$

$$I = \frac{PTR}{100}$$

$$600 = \frac{P \times 10 \times R}{100}$$

$$R = \frac{6000}{P}$$

4. Given P = 100 T = $\frac{1}{2}$ year R = 10%.

$$I = \frac{100 \times \frac{1}{2} \times 10}{100} = 5/-$$

$$P = 100 + 5 = 105$$

$$I = \frac{105 \times \frac{1}{2} \times 10}{100} = 5.25 \text{ Rs.}$$

$10.25 \times 100 = 1025 \times 4$