

Alphitude tricks

1) find Unit digit eg 3^{75}

Common cycle for Single-Digit base:

Base 0 : Ends in 0

1 : ends in 1

2 : Cycle every 4 : {2, 4, 6, 8}

3 : Cycle every 4 : {3, 9, 7, 1}

4 : Cycle every 2 : {4, 6}

5 : Ends in 5.

6 : Ends in 6

7 : Cycle every 4 : {7, 9, 3, 1}

8 : Cycle every 4 : {8, 4, 2, 6}

9 : Cycle every 2 : {9, 3}

Step 1 : find unit digit of the base
 Step 2 : find cycle of that base
 Step 3 : Modulo power by no. of cycle.
 Step 4 : Base remainder is any

eg 143^{58}

Step 1 : Base = 3

2 : Cycle of 3 $\Rightarrow \textcircled{4}$

3 : $58 \div 4 \Rightarrow 2$

4 : $3^2 \Rightarrow \textcircled{9}$ Ans

eg 7^{123}

Step 1 : Base = 7

2 : Cycle of 7 $\Rightarrow 4$

3 : $123 \div 4 \Rightarrow 3$

4 : $7^3 \Rightarrow \textcircled{3}$

If mod is 0
 then use n^m
 Number of the cycle

Time & Work

Q1 A do a work in 12 hours & B in 15 hours. How much time will they take if they work together.

$$\text{Ans} \quad A = \frac{1}{12} \quad B = \frac{1}{15}$$

$$\text{together} = \frac{1}{12} + \frac{1}{15} \Rightarrow \frac{15+12}{180} \Rightarrow \frac{27}{180} \left(\frac{3}{20} \right)$$

Time takes $\frac{20}{3} \Rightarrow 6.66$ hours.

Q.2 A & B \Rightarrow 12 days

B \Rightarrow 30 days

A \Rightarrow ?

$$\text{Ans} \quad A \Rightarrow \frac{1}{12} - \frac{1}{30} \Rightarrow \frac{30-12}{360} = \frac{18}{360} = \frac{3}{60} = \frac{1}{20}$$

A \Rightarrow 20 days

Q.3 A & B \Rightarrow 18 days B & C \Rightarrow 24 days C & A \Rightarrow 36 days

Find A, B & C \Rightarrow ?

Find A \rightarrow ?

$$\text{Sol} \quad A \& B = \frac{1}{18}$$

$$B \& C = \frac{1}{24}$$

$$C \& A = \frac{1}{36}$$

$$2(A \& B \& C) \Rightarrow \frac{1}{18} + \frac{1}{24} + \frac{1}{36} \Rightarrow \frac{4+3+2}{72} \\ \Rightarrow \frac{9}{72} = \frac{1}{8}$$

$$A \& B \& C \Rightarrow \frac{1}{16}$$

So A & B & C \Rightarrow 16 days

Find A $\Rightarrow (A \& B \& C - B \& C)$

$$\Rightarrow \frac{1}{16} - \frac{1}{24} \Rightarrow \frac{24-16}{16 \times 24} \Rightarrow \frac{8}{24 \times 24} \\ \Rightarrow \left(\frac{1}{48}\right)$$

A \Rightarrow 48 days

Q.4 A can do in 45 days, B can do in 40 days. They began work together but A leaves after some days, B finished remaining work in 23 days. After how many days did A leave?

$$\text{Ans) } A \Rightarrow \frac{1}{45} \quad B \Rightarrow \frac{1}{40}$$

$$A \text{ & } B \text{ together, } \frac{1}{40} + \frac{1}{45} = \frac{9+8}{360} = \frac{17}{360}$$

Work A & B together

$$\left(1 - 23 \times \frac{1}{40}\right) = \frac{17}{40}$$

$$\text{So } \frac{\frac{17}{40}}{\frac{1}{360}} = \frac{360}{40} = (9 \text{ days}) \text{ in which they work together}$$

(Q5) If 4 men & 6 boys can finish a piece of work in 20 days, In how many days 6 men & 11 boys finish it.

Ans = 4 men in 20 days

1 man in 5 days

6 boys in 20 days

1 boy in $\frac{20}{6}$ days

in 1 day $\Rightarrow \frac{1}{5}$ (Ans)

$\Rightarrow \left(\frac{6}{20} \text{ boy}\right)$

$\Rightarrow 6 \text{ men } \& 11 \text{ boys } \Rightarrow \left(6 \times \frac{1}{5} + \frac{1}{\frac{20}{6}} \times 11\right)$

$$\Rightarrow \frac{6 \times 4}{20} + \frac{6 \times 11}{20}$$

$$\Rightarrow \frac{24 + 66}{20} = \frac{90}{20} = \frac{9}{2} = (4 \frac{1}{2})$$

4 men in $\frac{1}{20}$

1 man " $\frac{1}{80}$

6 boys in $\frac{1}{20}$

1 boy $\Rightarrow \frac{1}{120}$

$$6 \text{ men \& 11 buys} \Rightarrow \frac{6}{80} + \frac{11}{120} \Rightarrow \frac{6 \times 3 + 2 \times 11}{240} \\ \Rightarrow \frac{18 + 22}{240} = \frac{40}{240} = \frac{1}{6}$$

So 6 men & 11 buys in 6 days.

Distance & Time [Distance \rightarrow Speed \times Time]

(Q1) Student walk from home to school at 5 Km/h, he is late by 30 minutes. If he walks at 6 Km/h, he is late by 5 min., find distance b/w his house & school.

Sol) Let time $\equiv t$

Case 1) Speed $\equiv 5$ Km/h
time $\equiv t$

Case 2) Speed $\equiv 6$ Km/h
time $\Rightarrow \cancel{t+25} +$ - time saved
 $\Rightarrow t - (30 - 5)$

$\Rightarrow t - \frac{25}{60}$ in hours

distance \equiv distance Case 2

$$5t \Rightarrow 6\left(t - \frac{25}{60}\right)$$

$$5t \Rightarrow 6t - \frac{150}{60}$$

$$t \Rightarrow \boxed{\frac{150}{60}}$$

$$t \Rightarrow 2.5$$

distance \Rightarrow Speed \times time $= 5 \times 2.5 = 12.5$ Km/h

(Q.1) There are 5 tires in a sedan (four road tires & 1 spare). Which is to be used equally in a journey to travel 40000 km. The no. of km of use of each tire was?

A/q) $\frac{40000}{5} \Rightarrow 8000$ km each tire can run

So No of km we can go $\Rightarrow (40000 - 8000)$
 $\Rightarrow 32000$ km
 On

$$(8 \times 4) \Rightarrow 32000 \text{ km}$$

(Q.2) Ram walks 36 km partly at speed of 3 km/h & partly at 4 km/h. If he had walked at a speed of 3 km/h when he had walked at 4 & 4 km/h when he had walked at 3, he would have walked only 34 km. The time (in hours) spent by Ram in walking was?

So Case I $d = 36 \text{ km}$

$$t_1 = n (3 \text{ km/h})$$

$$t_2 = y (4 \text{ km/h})$$

$$3n + 4y = 36 \quad \text{(i)}$$

Case 2 $\Rightarrow d = 34$

$$t_1 = y (3 \text{ km/h})$$

$$t_2 = n (4 \text{ km/h})$$

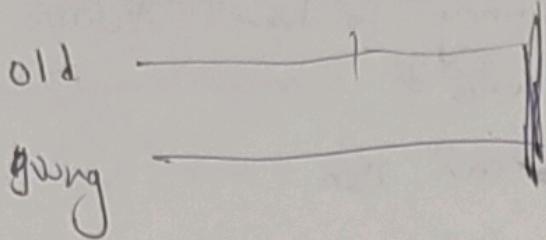
$$4n + 3y = 34 \quad \text{(ii)}$$

$$n = 4 \quad \text{try } y = 6$$

$$\xrightarrow{\text{Time Spent}} 4 + 6 = 10 \text{ hours}$$

(Q.4) An old man takes 30 minutes & young man takes 20 min to walk from apartment to office. If one day the old man started at 10:00 am. & the young man at 10:05 am. from the apartment to office, when will they meet?

i) A $\xleftarrow{n} \rightarrow$ O



meeting at \textcircled{d}

Let assume for old man

distance $\textcircled{d} \Rightarrow$

time $\Rightarrow t$

Speed $\Rightarrow \frac{n}{30}$

young man

distance $\Rightarrow d$

time $\Rightarrow (t-5)$

Speed $\Rightarrow \frac{n}{20}$

$$\frac{n}{30} \times t \Rightarrow \frac{n}{20} \times (t-5)$$

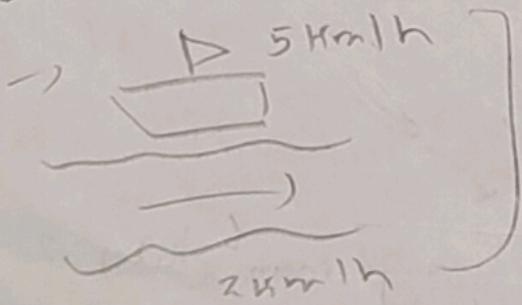
$$20(t) \Rightarrow 30(t-5)$$

$$20t \Rightarrow 30t - 150$$

$$150 = 10t \\ t = 15$$

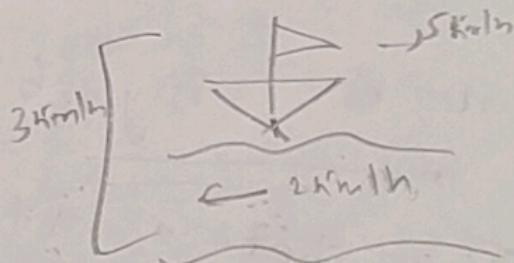
So At 10:15 am they will meet.

Boat & Stream

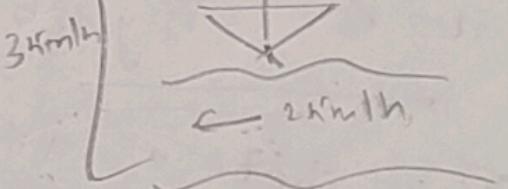


Downstream

7 km/h



Upstream



let say boat speed is U km/h
& water speed is V km/h

fun downstream = total = $(U+V)$ km/h

fun Upstream $\Rightarrow (U-V)$ km/h

Q1 A man can row upstream at 4 km/h & downstream at 8 km/h. find man's rate in still water & rate of the current.

$$\text{Ans} \quad U+V = 8$$

$$U-V = 4$$

$$U = 6 \text{ km/h}$$

$$V = 2 \text{ km/h}$$

Q2 A man rows 24 km downstream & 16 km upstream, taking 4 hours each time. find the velocity of current.

Ans Downstream
distance $\Rightarrow 24$

$$\text{time} = 4 \text{ hours}$$

$$\text{Speed} \Rightarrow U+V = \frac{24}{4} = 6 \quad V-U = \frac{16}{4} = 4$$

$$U+V = 6 \\ U-V = 4 \quad \Rightarrow \quad U = 5 \quad V = 1$$

Upstream
distance $\Rightarrow 16$
time $\Rightarrow 4 \text{ hours}$

Velocity of current is 1 km/h.

Q3) A man can row 4.5 km/h in still water & he finds that it takes twice as long as to row up as to row down the river. find the rate of the stream

$$\text{Ans} \quad U = 4.5 \text{ km/h} \quad U/V = 2 \text{ times}$$

$$\frac{D}{U-V} = \frac{2 \times D}{(U+V)} = 2V$$

$$U+V = 2U-2V \\ U = 3V \Rightarrow V = \frac{4.5}{3} = 1.5 \text{ km/h}$$

Q4) A man can row 8 km/h in still water. When he rows in a stream at 2 km/h, it takes him 3 hours 12 mins to row to a place & back. How far is the place? distance (2x)

$$\text{Sol Time} = \frac{\text{distance}}{5v} + \frac{\text{distance}}{5v+2}$$

$$(3 + \frac{12}{60}) \Rightarrow \frac{192}{8+2} + \frac{192}{8-2}$$

$$\frac{192}{60} \Rightarrow x \left[\frac{16}{60} \right]$$

$$x \Rightarrow \frac{192}{16} \quad (12)$$

(12)

km is Ans

Q5) A man can 30 km upstream & 44 km downstream in 10 hours, while he can row 40 km upstream and 55 km downstream in 13 hours. Find the rate of the current & the speed of man in still water.

$$\text{Sol} \quad \begin{aligned} \text{down} 30 \text{ km} \\ \text{down} 40 \text{ km} \end{aligned}$$

$$\text{down} 44 \text{ km}$$

$$\text{down} 55 \text{ km}$$

Time = 10 hours

Time = 13 hours

$$\text{let } p = u-v$$

$$q = u+v$$

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

$$10 = \frac{30}{u-v} + \frac{44}{u+v}$$

$$13 = \frac{40}{u-v} + \frac{55}{u+v}$$

$$10 = 30p + 44q \quad \text{on solving } p = \frac{1}{5}$$

$$13 = 40p + 55q \quad q = \frac{1}{11}$$

$$\frac{1}{u-v} = \frac{1}{5}, \quad \frac{1}{u+v} = \frac{1}{11}$$

$$u-v = 5$$

$$u+v = 11$$

$$\frac{2u}{u+v} = \frac{16}{11} \quad \therefore u = 3$$

Ratio & Proportion

(Q1) Divide Rs 420 among A, B & C in the ratio $\frac{1}{3} : \frac{5}{6} : \frac{7}{9}$

A/s) Let $A = x$ be $\textcircled{2}$ so $\frac{1}{3}x + \frac{5}{6}x + \frac{7}{9}x = 420$

$$\frac{6x + 35x + 14x}{18} \Rightarrow (420), \frac{35x}{18} \Rightarrow 420$$

$$n, \frac{420}{18} \times 18 \Rightarrow (12 \times 18) \Rightarrow 216$$

$$A = \frac{72}{5}, B = \frac{5 \times 216}{5}, C = \frac{7 \times 216}{9}$$

$$A = 72, B = 180, C = 168$$

on Method 2 (same but little bit
longer)

Just Multiply by LCM

$$\left(\frac{1}{3}, \frac{5}{6}, \frac{7}{9}\right) \times \text{Multiply by LCM} \Rightarrow \textcircled{18}$$

$$\Rightarrow \frac{1 \times 18}{3} : \frac{5 \times 18}{6} : \frac{7 \times 18}{9} \\ \Rightarrow (6 : 15 : 14)$$

$$\text{So } 6n + 15n + 14n \Rightarrow (420)$$

$$\Rightarrow 35n = 420 \Rightarrow n \Rightarrow \textcircled{12}$$

$$A \Rightarrow 6n \Rightarrow 12 \times 6 = 72$$

$$B \Rightarrow 15 \times 12 \Rightarrow 15 \times 12 = 180$$

$$C \Rightarrow 14 \times 12 \Rightarrow 168$$

Q.2) The no. of boys & that of girls in a school is in ratio of 5:3. If 16% of the boys & 20% of girls are scholarship holders. find the % of those who are not scholarship holders

Ans) Let boys be x So boys become $5x$ & girls $\Rightarrow 3x$

$$\text{Total} \Rightarrow (5x + 3x) \Rightarrow (8x)$$

Scholarship holders $\Rightarrow \frac{16}{100} \times 5x + \frac{20}{100} \times 3x$

No of scholarship \Rightarrow Total - Scholarship

$$\Rightarrow 8x - \left[\frac{16}{100} \times 5x + \frac{20}{100} \times 3x \right]$$

Ratio of Not scholarship $\Rightarrow \frac{8x \times 100 - 16 \times 5x - 20 \times 3x \times 100}{100}$

$$\Rightarrow \frac{(8 \times 100 - 80 - 60)x \times 100}{100 \times 8x}$$

$$\Rightarrow \frac{720 - 60}{8} \Rightarrow \frac{660}{8} = 82.5\%$$

$$\Rightarrow 82.5\%$$

Q.3) A & B are two alloys of gold & copper prepared by mixing metals in the ratios 7:2 and 7:4 respectively. If equal quantity of alloy are melted to form a third alloy C, find the ratio of gold & copper in C.

Ans) Case 1 In ratio of 7:2 lets say we have 1 gram

of this alloy

$$\text{So Gold} \Rightarrow \frac{7}{9} \text{ gram}$$

Total

$$\text{Copper} \Rightarrow \frac{2}{9} \text{ gram}$$

=

Case ② ratio $\Rightarrow 7:11$ we have 1 gram of this alloy

$$\text{Gold} \Rightarrow \frac{7}{18} \quad \text{Copper} \Rightarrow \frac{11}{18}$$

They are melted together so ratio of each

$$\frac{\text{Total Gold}}{\text{Total Copper}} = \frac{\frac{7}{9} + \frac{7}{18}}{\frac{2}{9} + \frac{11}{18}} = \frac{\frac{14+7}{18}}{\frac{4+11}{18}} = \left(\frac{21}{18}\right) \left(\frac{7}{5}\right)$$

Q 4) An employee reduces the no. of employees in the ratio of 9:8 & increases their wages in the ratio 14:15. In what ratio the wages bill is increased or decreased?

Any 9n No of employee \Rightarrow 9n

Ab No of Employee 8n

$$\text{Wages} \Rightarrow 14y$$

$$\text{wages} \Rightarrow 15y$$

$$9n \times 14y$$

$$8n \times 15y$$

$$126 ny$$

decreased

$$120 ny$$

Ratio \Rightarrow

$$\frac{126 ny}{120 ny} \Rightarrow \frac{21}{20}$$

$$\frac{21}{20} (1.05)$$

Age

(Q1) The age of Kamal & Vimal are in ratio of 3:2
After 5 years, the ratio of their ages will be 4:3
Find present age of each

Sol) Let Kamal age x & Vimal be y

$$\text{Sol} \quad \frac{x}{y} = \frac{3}{2}$$

$$2x = 3y \quad \leftarrow \text{is}$$

$$\text{on } x = \frac{3}{2}y \quad \boxed{3}$$

After 5 year $\frac{x+5}{y+5} = \frac{4}{3}$ $\boxed{3x+15 = 4y+20}$

$$\frac{3x+15}{2} = 4y + 20 \Rightarrow \frac{1}{2}y = 5$$

$$y = 10$$

$$x = \frac{3}{2}y = \frac{3}{2} \times 10 = 15$$

Kamal is 15 years Vimal = 10 years

(Q2) The sum of the ages of man & his son is 100 years. Five years ago their age were in ratio of 2:1. What will be the ratio of their ages after 10 years?

Sol) Let dad be x Son be y

$$x+y = 100 \quad \boxed{1}$$

$$\frac{x-5}{y-5} = \frac{2}{1}$$

$$x-5 = 2y - 10$$

$$x-2y = -5 \quad \boxed{2}$$

$$\begin{aligned} x-y &= 5 \\ x+y &= 100 \\ \hline - & - \\ x &= 55 \\ y &= 35 \end{aligned}$$

$$x = 55$$

Q On solving $y = 35$

$$n = 65$$

$$\text{Sol Ratio after 10 years} \frac{n+10}{y+10} \Rightarrow \frac{65+10}{35+10} = \frac{75}{45}$$
$$\Rightarrow \left(\frac{15}{9}\right) \left(\frac{5}{3}\right)$$

(Q3) Aril is as much younger to Debbar as he is older to Vikas. If total the age of Debbar & Vikas in 52 years. how old is Aril?

S.P.W) Aril $\Rightarrow A$ Debbar $\Rightarrow D$ Vikas $\Rightarrow V$

$$A - n = D - 6 \quad | \quad A + n = V - 6$$
$$A + n = V - 6$$
$$2A = V - 6$$
$$2A = 52$$
$$A = 26$$

(Q4) Kamla got married 6 years ago. Today her age is $\frac{1}{4}$ times her age at the time of marriage. If son's age is $\frac{1}{10}$ times her age what is the present age of her son?

Sol) Let Kamla's age be n years son's age y

$$\text{age } n = \frac{1}{4}(n - 6)$$

$$n = \frac{5}{4}(n - 6)$$

$$4n = 5n - 30$$
$$\frac{1n}{1n} = \frac{30}{30}$$

$$y = \frac{1}{10}n$$

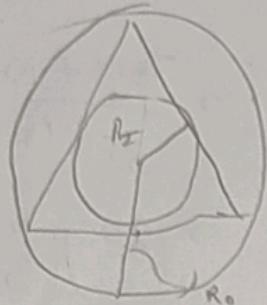
$$y = \frac{30}{10} \Rightarrow 3$$

$y = 3$ years

Q. 0.2) A... S. I. +

Area

b (0.1)



$$\Delta \text{ area} = \frac{1}{2} \times b \times h$$

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

$$s = \frac{a+b+c}{2}$$

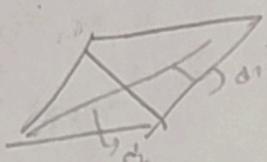
→ for equilateral Δ

$$R_I = \frac{a}{2\sqrt{3}}$$

as sides of Δ

$$R_o = \frac{a}{\sqrt{3}}$$

$$\text{height} = \frac{\sqrt{3}}{2} a$$



$$\text{area} = b \times h$$

$$\Rightarrow \frac{1}{2} (d_1 \times d_2)$$

Q. 0.2) If each side of square is ↑ (increased) by 150%
find incr. per in area

Sol. let sides of square = a

$$\text{Increment} \Rightarrow a + \frac{150}{100} a = \left(\frac{5}{2} a\right)$$

$$\text{Now } \underline{1.5 \times 1.5} \times 100$$

Q. 0.3) Area \rightarrow New area

$$a^2 \rightarrow \frac{25}{4} a^2$$

$$\text{increment} \Rightarrow \left(\frac{25}{4} a^2 - a^2\right) \Rightarrow \left(\frac{21}{4} a^2\right)$$

$$\therefore \text{increase} \Rightarrow \frac{21}{4} a^2 \times 100 \Rightarrow 21 \times 25$$

$$\Rightarrow \boxed{525} \%$$

Q.2) Arc of length 22 cm of \textcircled{O} subtends 72° at \textcircled{O} .
What is the radius?

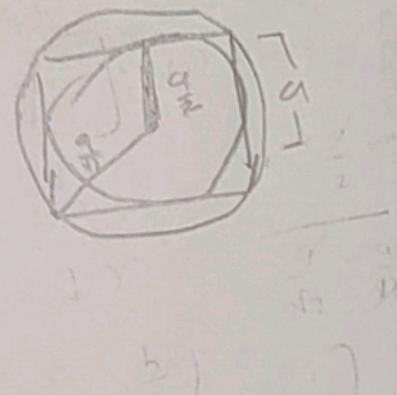
$$\text{Sol} \quad \text{Ans} \rightarrow \frac{\theta}{360} \times 2\pi r \rightarrow 22$$

$$\frac{72}{360} \times 2 \times \frac{\pi}{7} \times r \rightarrow 22$$

$$180 \quad \frac{10}{180} \times \frac{180 \times \pi}{7} \times r_2 \rightarrow \frac{35}{2} \rightarrow 17.5 \text{ cm}$$

Q.3) Ratio b/w area of 2 circles which have respectively been inscribed in a square & circumscribed about the same square.

$$\text{Sol} \quad \text{diagonal of square} \rightarrow \frac{a}{\sqrt{2}}$$



Q.4) There is town, where front & rear wheel's of diff sizes, the measurement unit followed in the town is Meter. The circumference of the front wheel of car is 133 m & rear is 190 m. What is the distn travelled by car in meters when the front wheel has done 9 more revolutions than the rear.

$$\text{Sol} \quad \text{Front} \rightarrow 2\pi n \rightarrow \frac{133}{2\pi} \quad \text{Rear} \rightarrow 2\pi R = 190 \\ 12 \Rightarrow \frac{190}{2\pi}$$

Pear (X notation)

$$n \times 2\pi R$$

$$n \times 190$$

front ($n+q$) rotation

$$(n+q) (2\pi n)$$

$$(n+q) \times 133$$

$$190n = 133n + q \times 133$$

$$190n - 133n = q \times 133$$

$$57n = q \times 133$$

$$n = \frac{1197}{57}$$

distance travelled by tyros $\rightarrow \frac{1197}{57} \times (2\pi R)$

$$\Rightarrow \frac{1197}{57} \times (190)$$

$$\approx 3990.$$

Ques C

(a) ENGLISH NEIGHBORHOOD

Sol. Duplicate -

$$\begin{array}{l}
 E - 3 \\
 N - 3 \\
 H - 2 \\
 I - 2 \\
 R - 1
 \end{array}$$

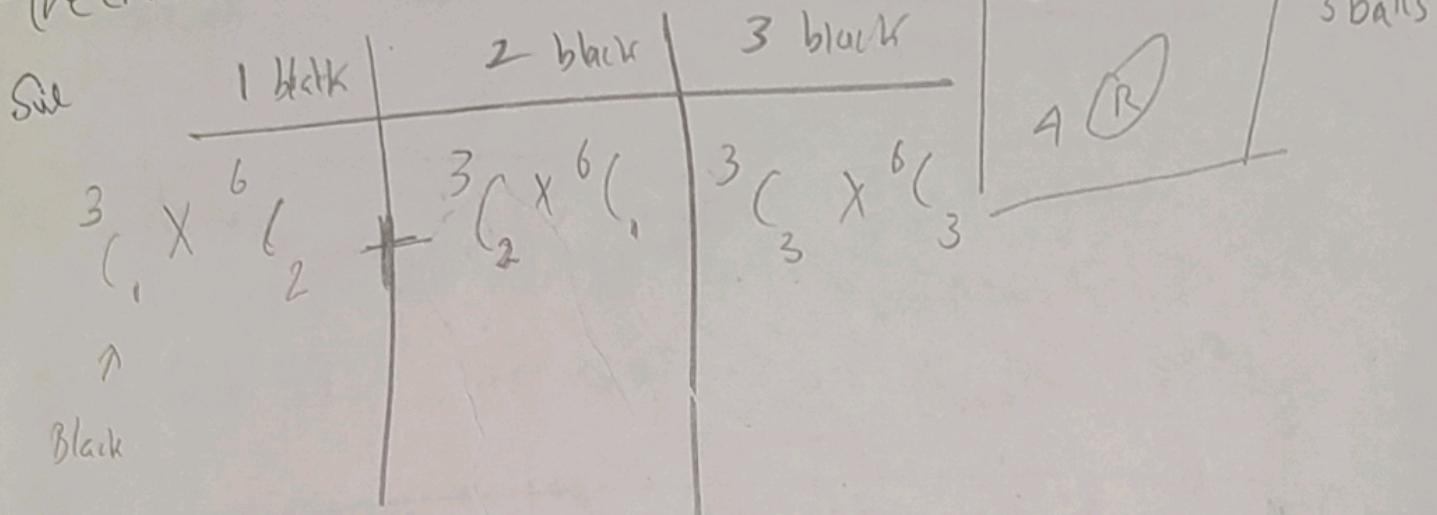
No. of. Arrangement

$$\frac{11!}{3! \times 3! \times 2!} \Rightarrow \frac{11! \times 10!}{3! \times 2! \times 2!} \times 5$$

$$\Rightarrow 11! \times 45 \times 35 \times 20$$

$\therefore \approx$

(Q2) A box contain 2 white, 3 black & 4 red ball
 In how many ways can 3 balls be drawn from the
 box, if at least 2 black ball is to be included in
 the draw?



$$\Rightarrow 3C_1 \times C_2 + 3C_2 \times C_1 + 3C_3 \times C_3$$

$$\Rightarrow \frac{3}{1} \times \frac{6 \times 5}{2 \times 1} + \frac{3}{1} \times \frac{6}{1} + \frac{6 \times 5 \times 4}{3 \times 2 \times 1} \times 1$$

$$\Rightarrow 45 + 18 + 20 \rightarrow 65 + 18 \rightarrow 83$$

Prob

(Q.1) A bag contains 6 white & 4 black ball. Two balls are drawn at random. Find the prob that they are of the same colour.

$$\text{Sol) } \frac{6C_2 \times 4C_6 + 6C_6 \times 4C_2}{10C_2}$$

$$\Rightarrow \frac{\frac{6 \times 5}{2} \times 1 + \frac{1 \times 4 \times 3}{2}}{10 \times 9} = \frac{1}{2}$$

$$\Rightarrow \frac{30 + 12}{90} = \frac{42}{90} = \left(\frac{7}{15}\right) = \left(\frac{7}{15}\right)$$

Q2) A man & his wife appear for an interview for two vacancies in the same post. The probability of husband selection is $\frac{1}{7}$ & that of wife is $\frac{1}{5}$. What is probability that one of them is selected?

Sol) Only one of them is selected so.

Only one of them is not selected i.e.

$$\frac{1}{7} \times \left(\frac{4}{5}\right) + \left(\frac{6}{7} \times \frac{1}{5}\right)$$

↳ not selecting husband

$$\Rightarrow \frac{4}{35} + \frac{6}{35} \Rightarrow \frac{10}{35} = \left(\frac{2}{7}\right)$$

①
of
So

(Q3) A speaks truth in 75% and B in 80%. In what % they are likely to contradict each other. If narrating the same in 150

$$\text{Sol} \quad \frac{75}{100} \times \left[1 - \frac{80}{100}\right] + \left[\frac{75}{100}\right] \left[\frac{80}{100}\right] \Rightarrow \frac{75}{100} \times \frac{20}{100} + \frac{75}{100} \times \frac{80}{100}$$

↑ ↑
A truth B lie A lie B truth $\Rightarrow 0.15 + 0.20$
 $\boxed{0.35}$

Interest $SI = \frac{P \times R \times T}{100}$ T in years
Amount $\Rightarrow P + SI$

(Q1) Find SI in Rs 1600 at 6% p.a for 146 days.

$$SI \quad SI = \frac{1600 \times 6 \times 146}{365} \Rightarrow \boxed{38.46}$$

(Q2) A sum at 9% per annum SI acc to Rs 2921 in 3 years

Find sum.

$$\text{Sol} \quad P + SI \Rightarrow 2921, \quad P + \frac{P \times 9 \times 3}{100} \Rightarrow 2921, \quad P + \frac{P \times 9 \times 3}{100} \Rightarrow 2921$$

$$P \left[\frac{100 + 27}{100} \right] \Rightarrow 2921 \Rightarrow \left[\frac{2921 \times 100}{(127)} \right] \Rightarrow \boxed{2300}$$

(Q3) At what rate percent per annum at SI , will a sum of money double in 8 years?

$$\text{Sol} \quad P + SI \Rightarrow 2 \times P \quad \left(\frac{1+R \times 8}{100} \Rightarrow 2 \right)$$

$$P + \frac{P \times R \times 8}{100} + 2 \times P \quad \frac{R \times 8}{100} \Rightarrow 1$$

$$1 + \frac{R \times 8}{100} \Rightarrow 2 \quad \left(\frac{1+R}{100} \right)^8 \Rightarrow 2 \quad R \cdot \frac{100 \times 5}{8 \times 2} \times$$

$$\therefore 12.5\%$$

(Q.8) A sum of RS 8000 was lent partly at 8% and partly at 10% per annum. SI. If total amount interest be RS 714, find sum lent at 8%.

Ans) Let x) $(8000 - x)$ be the amount

$$\frac{x \times 8\%}{100} + \frac{(8000 - x) \times 10}{100} = 714$$

$$8x + 80000 - 10x = 71400$$

$$2x = 8600$$

$$\text{Sum at } 8\% \Rightarrow$$

$$8000 + \frac{8000 \times 8\%}{100} = 8000 + 640$$

$$\Rightarrow 8640$$

Compound Interest

$$\text{Amount} \Rightarrow P \left(1 + \frac{R}{100}\right)^n \text{ for Annually}$$

$$\text{Amount} \Rightarrow P \left(1 + \frac{R}{2 \times 100}\right)^{2n} \text{ for half years}$$

$$\text{on General formula } A \Rightarrow P \left(1 + \frac{R}{n \times 100}\right)^n$$

$$(I \Rightarrow A - P)$$

eg Amount for 3 year 3 months

$$P \left(1 + \frac{R}{100}\right)^3 \left(1 + \frac{3}{12} \times \frac{R}{100}\right)$$

(Q1) $I \Rightarrow$ on RS 18750 at 8% per annum for 2 years 5 months

$$\text{Sol } P \Rightarrow P \left(1 + \frac{R}{100}\right)^2 \left(1 + \frac{R}{12 \times 100}\right)$$

$$\Rightarrow 18750 \left(1 + \frac{8}{100}\right)^2 \left(1 + \frac{8 \times 5}{100 \times 12}\right)$$

$$\Rightarrow 18750 \times \frac{108}{100} \times \frac{108}{100} \left(\frac{12\%}{2 \times 100} \right) \Rightarrow 18750 \times 1.08 \times 0.09 \times 0.12 = 22599$$

$$(I \Rightarrow A - P) \Rightarrow 22599 - 18750 \\ 12\% \Rightarrow 3849 \text{ ₹}$$

Q.2) I on 5000 for 3 years. Rate $\Rightarrow 5\%$ for 1st year
 Rate $\Rightarrow 8\%$ for 2nd yr
 Rate $\Rightarrow 6\%$ for 3rd yr

Sol $I \Rightarrow A - P$

$$\Rightarrow 5000 \left(1 + \frac{5}{100} \right) \left(1 + \frac{8}{100} \right) \left(1 + \frac{6}{100} \right) - 5000$$

$$\Rightarrow 5000 \times 1.05 * 1.08 \times 1.06 - 5000$$

$$\Rightarrow 6235 - 5000$$

$$\Rightarrow 1235 \text{ ₹}$$

Q.3) Find I on 25000 at 12% per annum for 1 year compounded half-yearly

$$\text{Sol) } (I \Rightarrow 25000 \times 25000 \left(1 + \frac{12\%}{2 \times 100} \right)^2 - 25000)$$

$$\Rightarrow 25000 \times 25000 (1.06)^2 - 25000$$

$$\Rightarrow 25000 \times 25000 \times 1.06 \times 1.06 - 25000$$

$$\Rightarrow 2090$$

(Q.4) A sum on compound interest amounts to Rs 30250 in 2 years & Rs 33275 in 3 years. find the sum & rate

V. P.A.

$$\text{Ans} \quad P + P\left(1 + \frac{R}{100}\right)^2, \quad 30250 \Rightarrow P\left(1 + \frac{R}{100}\right)^2$$

$$33275 \Rightarrow P\left(1 + \frac{R}{100}\right)^3$$

dividing each

$$\frac{33275}{30250} \Rightarrow \left(1 + \frac{R}{100}\right)^3$$

$$\frac{33275 - 30250}{30250} \Rightarrow \left(\frac{R}{100}\right), \quad \frac{3025}{30250} \Rightarrow \left(\frac{R}{100}\right)$$

$$R \Rightarrow \boxed{10}$$

$$30250 \Rightarrow P\left(1 + \frac{10}{100}\right)^2, \quad 30250 \Rightarrow P\left(1 + \frac{10}{100}\right)^2$$

$$\Rightarrow P\left(\frac{11}{10}\right)^2$$

$$\cancel{2750} \cancel{250}$$

$$\cancel{30250} \times \frac{100}{11 \times 11} = (P)$$

$$\boxed{25000 = P}$$

Clock

Min hand

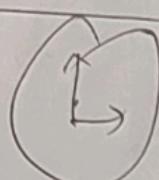
$$60 \text{ min} \Rightarrow 360^\circ$$

$$1 \text{ min} \Rightarrow \frac{360}{60} \Rightarrow \boxed{6^\circ}$$

Hour hand

$$60 \text{ min} \Rightarrow 30^\circ$$

$$1 \text{ min} \Rightarrow \frac{1}{2}^\circ$$



$$\begin{cases} \text{Angle between min} \\ \text{hour hand} \Rightarrow \\ A \Rightarrow |30H - 5.5 \text{ min}| \end{cases}$$

Top Use this table \Rightarrow

Observation: In 60 min

Minute hand makes 360° & at 60 min
1 hour hand makes 30° & at 5 min

Minute hand is 55 min ahead of hour hand

No of times hands coincide (Min & hour) \Rightarrow all these coincide

In every hour = 1 time

at 12:00

In every 12 hours = 11 times

at 12 hours = 1 time

In every 24 hours = 22 times

24 hours = 2 times

No of times hands opp. to each other

In every hour = 1 time

12 - 1 = 2 times

In every 12 hours = 11 times

1 - 2 = 2

In every 24 hours = 22 times

2 - 3 = 1

In every 24 hours = 22 times

3 - 4 = 2

No of times hands are at 90° from each other

In every hour = 2 times

4 - 5 = 2

In every 12 hours = 22 times

5 - 6 = 2

In every 24 hours = 44 times

6 - 7 = 2

In every 24 hours = 44 times

7 - 8 = 2

Time in mirror image

8 - 9 = 1

Mirror time \Rightarrow 11:00 - Actual time

9 - 10 = 2

Mirror time \Rightarrow 11:00 - Actual time

10 - 11 = 2

(Q2) Before 2:00 & 10:00, how many times the hands of clock are at right angle.

11 - 12 = 2

So use this table $\Rightarrow 1 + 2 + 2 + 2 + 2 + 2 + 1 \Rightarrow 14$

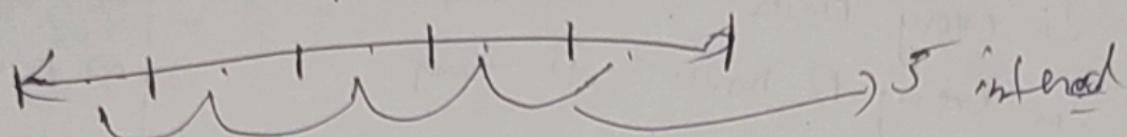
Ans: 110°

(Q) Find angle b/w the hour & min at 2:25

A) $A = |30 \times 2 - 5.5 \times 25|$
 $\Rightarrow |60 - 137.5| = 77.5^{\circ}$

(Q) A wall clock taking 10 sec to strike 6. How much time it will take to strike 12?

Ans)



$$\frac{10}{5} \Rightarrow 2 \text{ sec}$$

$$\text{for 12 strike} \Rightarrow [11 \times 2] \Rightarrow 22$$

(Q) Find the time b/w 8 & 9 o'clock when hands of clock are in same straight line but not together.

Sol) $A = |30H - 5.5 M|$

$$180 \Rightarrow |30 \times 8 - 5.5 M|$$

$$180 - 240 \Rightarrow \frac{-11}{2} M$$

$$-60 \times 2 \Rightarrow M$$

$$-11$$

$$\frac{120}{11} \Rightarrow M$$

$$\boxed{10\frac{10}{11} \text{ min}}$$

A) Before clock is 8:12 find mirror time

Ans) $11:60 - 8:12 \Rightarrow [3:48] \leftarrow$

Q.) At what time b/w 5:30 & 6 will the hand of clock be inclined at 90° .

Ans A $\Rightarrow |30H - \frac{11}{2}M|$

$90 = |30 \times 5 + \frac{11}{2}M|$

$90 = |150 - \frac{11}{2}M|$

$\frac{11M}{2} = 60$

$M = \frac{120}{11}$

$M \geq 10\text{ min } 55\text{ sec}$

$90 = -150 + \frac{11}{2}M$

$240 = \frac{11}{2}M$

$480 = M$

"

$M = 43\text{ min } 38\text{ sec}$

Just calc
between 5 & 6
then two time
will come

the above accords

So after 5:30 & 6:00

Ans is $43\text{ min } 38\text{ sec}$

or

$$\frac{480}{11} = 43\frac{7}{11}$$

$$1+2+3+4+\dots+n = \frac{(n)(n+1)}{2}$$

$$1^2+2^2+3^2+4^2+\dots+n^2 = \frac{(n)(n+1)(2n+1)}{6}$$

$$\left. \begin{aligned} 1^3+2^3+3^3+\dots+n^3 \\ \Rightarrow \frac{1}{4}(n)^2(n+1)^2 \end{aligned} \right\}$$

$$(Q2) \frac{171 \times 171 \times 171 - 64 \times 64 \times 64}{171 \times 171 + 171 \times 64 + 64 \times 64}$$

$$\text{Ans } a^3 - b^3 \Rightarrow (a-b)(a^2 + ab + b^2)$$

$$a-b \Rightarrow \frac{a^3 - b^3}{a^2 + ab + b^2} \Rightarrow \frac{(171)^3 - (64)^3}{(171)^2 + 171 \times 64 + (64)^2}$$

$$\Rightarrow (171 - 64) = 107$$

$$(Q3) \text{ Unit digit of } 3^{61} \times 6^{51} \times 7^{63}$$

Sol 3^{61}

$3 \rightarrow 4$ cycle

$61 \div 4 \Rightarrow 1$

$3^{61} \rightarrow 3$

6^{51}

$6 \rightarrow 1$ cycle

$\textcircled{6}$

6

7^{63}

$7 \rightarrow 4$ cycle

$63 \div 4 \Rightarrow 3$

$\textcircled{3} \rightarrow \textcircled{5}$

$3 \times 6 \times 3 \rightarrow \textcircled{4}$ unit digit

#Geometry

#No of diagonals in polygon $\approx \frac{n(n-3)}{2}$

#Interior angle sum in polygon $\rightarrow (n-2) \times 180^\circ$

#Calendar

$100 \text{ years} \Rightarrow \frac{24 \text{ leap year} + 76 \text{ non leap year}}{100}$

200 years $\Rightarrow 5 \times 2 \Rightarrow 10 \frac{1}{7} \Rightarrow$ 3 odd days

300 years $\Rightarrow 15 \Rightarrow 15 \cdot 1 \cdot 7 \Rightarrow 1$ odd day

400 years $\Rightarrow 5 \times 4 + 1 \Rightarrow 21 \frac{1}{7} \Rightarrow$ odd days.

800 years 0 odd days

600 $\Rightarrow 400 + 200 \Rightarrow$ 3 odd days.

400 3 =

0	1	2	3	4	5	6
Sun	Mon	Tue	Wed	Thurs	Fri	Sat

(Q.1) What was the day of week on 16th July 1976?

Ans) odd day calc

1600 years $\Rightarrow 0$

100 years $\Rightarrow 5$ day

75 years $\Rightarrow 18 \times 2 + 57 \times 1 = 36 + 57 = 93 \frac{1}{7}$
 \downarrow \uparrow \uparrow
75 ⑧+ leap ordinary
 $\Rightarrow 2$ odd days

Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July
↓													
31	31	30	31	30	31	31	30	29	31	30	31	31	
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	
3	3	2	3	2	3	2	1	2	1	2	1	2	
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	
5	6	7	8	9	10	11	12	13	14	15	16	17	

1976 is divisible by 4 so leap year

by 4 so leap year

② odd day

January	$\Rightarrow 31 \Rightarrow 3$	odd days	Total $\Rightarrow 29/7 \Rightarrow 1$ m
Feb	$\Rightarrow 28 \Rightarrow 0$	days	
March	$\Rightarrow 31 \Rightarrow 3$	day	
April	$\Rightarrow 30 \Rightarrow 2$	days	
May	$\Rightarrow 31 \Rightarrow 3$	days	
June	$\Rightarrow 30 \Rightarrow 2$		
July	$\Rightarrow 31 \Rightarrow 3$		
Aug	$\Rightarrow 31 \Rightarrow 3$		
Sep	$\Rightarrow 30 \Rightarrow 2$		
Oct	$\Rightarrow 31 \Rightarrow 3$		
Nov	$\Rightarrow 30 \Rightarrow 2$		
Dec	$\Rightarrow 31 \Rightarrow 3$		

100 years how many ~~ordinary~~ odd days

$\hookrightarrow 76$ and 24 leap

$$\Rightarrow 76 \times 1 + 24 \times 2$$

$$\Rightarrow 76 + 48 = \frac{124}{X} 17 \text{ months } \textcircled{S}$$

15 odd days.

Total odd day $\Rightarrow 0+5+2+2 \Rightarrow 9 \text{ odd days} \rightarrow \textcircled{2} \text{ Tuesday}$

(2) Day on 26th Oct 2009 ?

Sol) 2000 \Rightarrow 0 odd day

8 years $\Rightarrow 8/4 \Rightarrow 2 \text{ } \& \text{ } 2 \text{ leap year}$

$\hookrightarrow 2 \text{ leap} + 6 \text{ ordinary days}$

$\hookrightarrow 2 \times 2 + 4 \times 1 \Rightarrow 4 + 6 \Rightarrow 10 \text{ ordinary days}$

$\hookrightarrow 10 - 1.7 \Rightarrow 3 \text{ odd days}$

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
31	28	31	30	31	30	31	31	30	26
\downarrow									
3	0	3	2	3	2	3	3	2	5

26/10/2009

$\Rightarrow 5 \text{ odd days}$

Total odd days $\Rightarrow 0+3+5 \Rightarrow 8 - 1.7 \Rightarrow \textcircled{1}$
 \Rightarrow ~~Tuesday~~ Monday

(3) If 10th May 1997 was Monday, what was the day on 10th Oct 2001?

Ans) for this type of quest just do like this

	May	Jun	July	Aug	Sep	Oct	Nov	Dec
	↓	↓	↓	↓	↓	↓	↓	↓
num. 21	30	31	31	30	31	30	31	31
	↓	↓	↓	↓	↓	↓	↓	↓
	2	3	3	2	3	2	3	3
⇒ Total	18	7	7	7	4	6	6	5

1998 = 1 odd day, 1999 = 1 odd day

2000 = leap year so ⇒ 2 odd day

Now for 2001 ↗

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct
	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
34	28	31	30	31	30	31	31	31	30	30
	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	2	0	3	2	3	2	3	2	3	3

⇒ 14.1.7.0 ③ odd

Total odd days = 4 + 1 + 1 + 2 + 3
⇒ 14.1.7 ⇒ 4 odd days

Monday + 4 → Friday

formula for day calc from date

$$h = \left(2 + \left\lfloor \frac{13(m+1)}{5} \right\rfloor + K + \left\lfloor \frac{K}{q} \right\rfloor + \left\lfloor \frac{J}{q} \right\rfloor + SJ \right) \times 7$$

$h \Rightarrow$ day of the week ($0 \Rightarrow$ Saturday $1 \Rightarrow$ Sunday
 \sim $6 \Rightarrow$ Friday)

2nd day of the Month

My month (Jun 1, — March 3)

\rightarrow Year of entry \Rightarrow Year Mod WS

→ now based Century → Year
1850

eg day on 10 oct 2008

eg (ay on)
Sul) $q = 10$. $m = 10 \text{ (or)} 1$, year 2001 , $k = 101$

$$J = \left\lfloor \frac{2001}{1000} \right\rfloor \Rightarrow \boxed{20}$$

↑
from soln.

$$h = \left(10 + \left\lfloor \frac{13 \times (10+1)}{5} \right\rfloor + 1 + \left\lfloor \frac{1}{4} \right\rfloor + \left\lfloor \frac{2^0}{4} \right\rfloor + 5 \times 20 \right)^{1/7}$$

$$= [10 + 28 + 1 + 0 + 5 + 10] - 1.7$$

$$\Rightarrow 144 \text{ mod } 7 = 4$$

Sat \Rightarrow Wednesday as here in this formula
0 \Rightarrow Saturday \Rightarrow 1 \Rightarrow Sunday \Rightarrow 6 \Rightarrow Friday

Q.3) If for year 2009 is same for which year.

Sat 2009 2010 2011 2012 2013 ↓
↓ ↓ ↓ ↓ ↓
1 2 3 4 5
Sunday year 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

ordinary year

\Rightarrow ⑦ So ~~the~~ in 2015 you will have

Q for leap year generally calendar repeat at 28 years

Q.4) If for year 2007 is same for which yr

2007 2008 2009 2010 2011 2012
↓ ↓ ↓ ↓ ↓ ↓
1 2 3 4 5 6

\Rightarrow ⑧ So 2013

Either 7 or just greater than ⑦ we can count 24 days

The last day of Century can not be

Sol 100 \Rightarrow 5 odd day \Rightarrow Friday

200 \Rightarrow 3 odd day \Rightarrow Wed

300 \Rightarrow 1 odd day \Rightarrow Monday

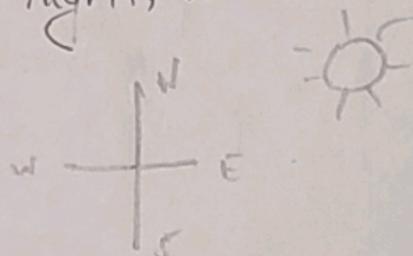
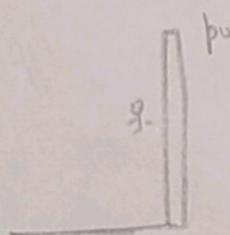
400 \Rightarrow 0 odd day \Rightarrow Sunday

It cannot be Tuesday, Thursday, Saturday.

{ Direction-based

(Q) One morning after sunrise, Gopal was standing facing the pole, the shadow of the pole fell exactly to right, which direction Gopal was facing.

Sol)

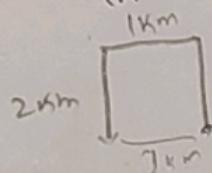


So he was facing South

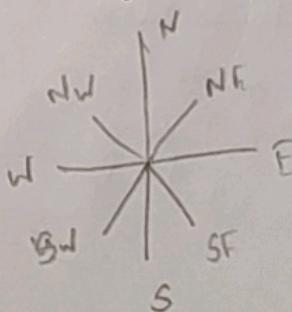
(South)

(Q) A boy rode his bicycle northwards, then turned left & rode one Km & again turned left and rode 2 Km. He found himself exactly 1 Km west of his starting point. How far did he ride northwards initially?

Sol



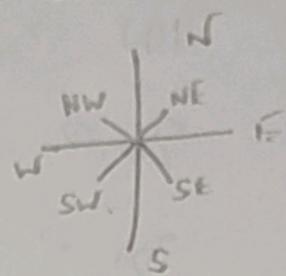
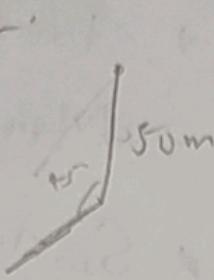
(2km)



(Q.) A man starts walking from his home southward a distance of 50 m. He then took a half turn towards right. In which direction is he walking now?

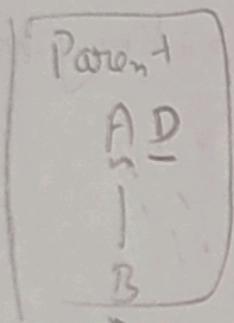
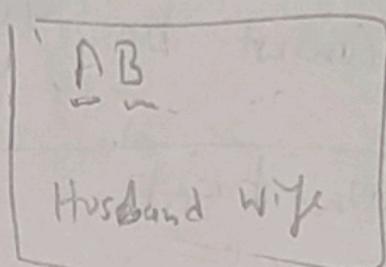
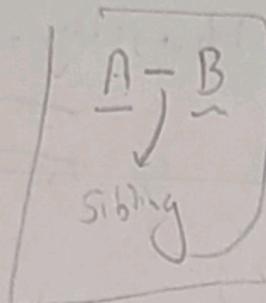
Ans) half turn means 45°

So NH is SW



Blood relation

A Male
B Female



o A is mother of B
D is father of B

(Q1) A & B are brothers. C & D are sisters. A's son is D's brother. How B is related to C?

Ans) A - B

C - D

A - B

So Uncle is an
on more precise \rightarrow Parental Uncle

A - D - C

(Q) $A+B$ means 'A is brother of B', $A-B$ means 'A's mother of B'.
 & $A \times B$ means A is sister of B, which means A is maternal
 uncle of B? (i) $A+B+C$ (ii) $A-B+C$ (iii) $A+C-B$
 (iv) $A+C \times B$

Ans)

$$A+B \rightarrow \underline{A}-B$$

$$A-B \rightarrow \begin{array}{c} A \\ | \\ B \end{array}$$

$$A \times B \Rightarrow \underline{A}-B$$

Eliminating option B

$$A+B+C \rightarrow \underline{\underline{A}}-\underline{\underline{B}}-\underline{\underline{C}} \checkmark$$

$$\times A-B+C \rightarrow \begin{array}{c} A \\ | \\ B-C \end{array}$$

$$A+C-B \rightarrow \begin{array}{c} A-C \\ | \\ B \end{array} \checkmark$$

option C

(Q4) Pointing out to the photograph, a man tells - You and she
 is the daughter of the only son my father's wife. How
 is she related to man?
 (a) Daughter (b) Cousin (c) Mother (d) Sister or Niece

Ans) Picture of some house

F W

|

① M

|

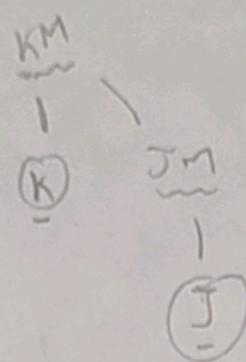
G

for girl his father

Q.) If Kunal Sir, John's Mother is the only daughter of my mother, how Kunal related to John?

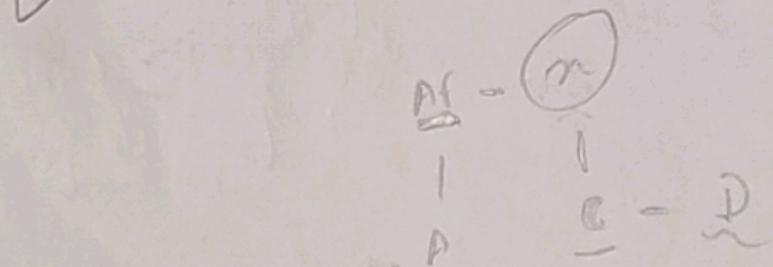
Ans)

So Maternal Uncle =



(a) C is A's father's Nephew, D is A's cousin but not the brother of C. How D is related to C?

- (a) Father (b) Sister (c) Mother (d) Aunt (e) None of these



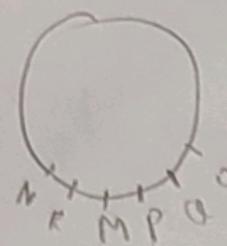
Sitting Arrangement

(Q1) Six persons M, N, O, P, Q, R are playing cards sitting in a circle facing the center. R is sitting between M and N and Q is sitting between O and P. ? is sitting at immediate right of M.

- (a) Who is sitting immediate left of O?
 (i) R (ii) M (iii) Q (iv) P (v) can't be determined

Q.) Who are the neighbours of R?

- (a) M, N (b)



Q.1) A B C D E F G H are sitting around a circular table facing the center. F is fourth to the left of A & second to the right of C. B is second to the left of A & A is to the immediate right of G. E, who is not in immediate neighbour of B is fourth to the left of D.

A1)

What is H's position w.r.t G?

A2) 4th to left

Who is second to the right of E?

A3) H

Who is the immediate right of F?

A4) D

#Direction

A group of 7 singers, facing the audience, are standing in a line on the stage as follows

i) D is right of C. ii) F is standing beside G.

iii) B is to the left of F. iv) E is to the left of A.

v) C & B have one person between them

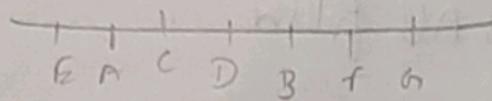
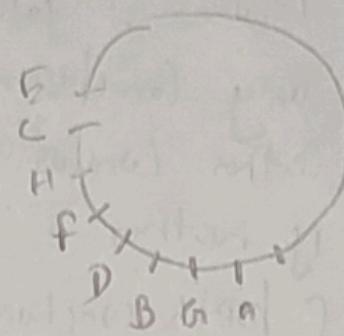
vi) A & D have one person between them.

Q.1 Who is on the extreme right?

A1) G

Q.2) If counting from left then C is on?

A2) 3rd



Syllogism

- (Q) All huts are mansions
 All mansions are temples
- (Conclusion)
 I) Some temples are huts
 II) Some temples are mansions

Ans) i) Conclusion I follows (only)

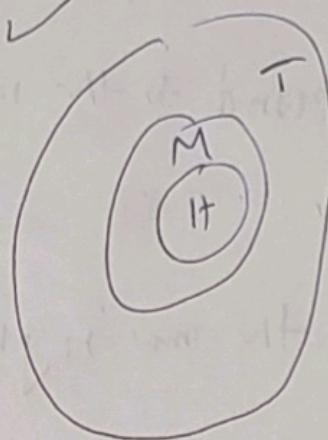
ii) Only Conclusion II follows

iii) Either Conclusion I or II follows

iv) If neither I nor II follows

v) If both conclusions I & II follow ✓

Ans) So both conclusions I & II follows



(Q) Statement

Some eye drops are eye drops. All eye drops are liquids.

Some liquids are drinkable.

(Conclusion)

I) Some eye drops are drinkable

II) Some ear drops are drinkable

III) All liquids are eye drops

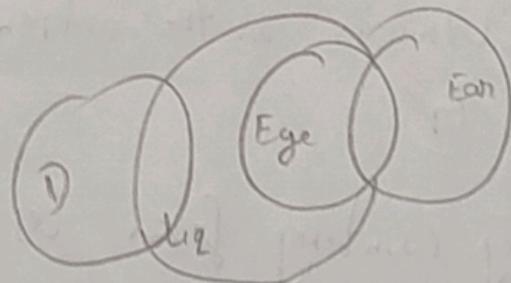
i) I & II follows

ii) II & III follows

iii) Only III follows

iv) All follow

iv) Non follow ✓

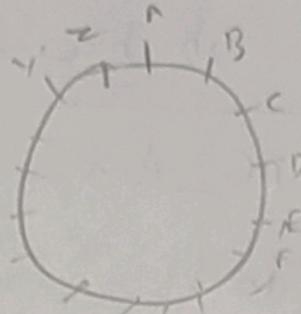


Ans

letter series

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

E	J	O	T	Y
1	5	14	20	25



Q1) Z S W O T K C G ? ?
 Ans)

O, C

Q2) RVA, VBLN, XIL, APP, DNS ?
 Ans) PIT b) GBM (c) GDU (d) PAR

R V X A D ⑥
 3 3 3 3

V B I P W ⑦
 7 7 7 7

Option (c) 1 GDU

Q3) AB, DEF, HIJK, ?, STUVWX

Ans) Acc to pattern = AB C DEF G HIJK MNOPQ R

MNOPQ

Q4) YEB, WFD, UHN, SKI, ?

Ans) Y W U S ⑧
 2 2 2

CENL

F F H K N
 ↓ ↓ ↓ ↓
 0 1 2 3

- (Q) $ab - \underline{ab} \underline{bb} - ab - a$
- (i) baub (ii) abbba (iii) abab (iv) aabb
- Ans $\underline{ab} \underline{ba}$ $\underline{abb} \underline{a} \underline{ab} \underline{b} \underline{a}$ ✓
- (Q) nc - dn - cddc - n - ddccnn
- (i) cdn dc (ii) dn dd (iii) dn cc (iv) nc dc

nc c dcn d cddc n n d ddcnn c
nc d dcn c cddc n n d ddcnn d
nc d dcn n cddc n n d ddcnn d
nc n dcn c cddc c n d ddcnn c

Number series

32, 87, 332, 1635,

Ans) 32 87 332 1635

$$32 \times 3 \Rightarrow 96 - 3 = 87$$

$$87 \times 4 \Rightarrow 348 + 1^2 = 332$$

$$332 \times 5 \Rightarrow 1660 - 5^2 = 1635$$

$$1635 \times 6 \Rightarrow 9810 - 36 = \boxed{9774}$$

(Q) 56 58 62 70 84 118 180] No that does not follow

$$\begin{array}{ccccccc} 56 & \boxed{58} & 62 & \boxed{70} & 84 & 118 & 180 \\ \cancel{2} & \cancel{4} & \cancel{2} & \cancel{2} & \cancel{2} & \cancel{2} & \cancel{2} \end{array}$$

$$So \boxed{84}$$

$$910 \quad 14 \quad 28 \quad 32 \quad 64 \quad 68$$

$\downarrow \times 2 \quad \downarrow \quad \downarrow \times 2 \quad \downarrow +4 \quad \downarrow \times 2$

(B2) No that doesn't follow series.

B2.

Coding-Decoding

MENTION

(Q) In a certain code, MENTION is written LNEITNO. How is PATTERN written in that code?

MENTION
 $\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow$
 L N E I T N O

P A T T E R N
 $\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow$
 $\boxed{L \quad T \quad A \quad E \quad T \quad N \quad R}$

(Q) In a certain language NEOMAN is coded as OGRQFT which word will be coded as ZKCLUP

(a) YJBKTQ

(b) XIAJSN

✓YIZAPJ

(d) ZKCLUP

(c) NEOMAN
 $\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow$
 $O \quad G \quad R \quad Q \quad F \quad T$
 $2 \quad 3 \quad 4 \quad 5 \quad 6$

Y I
 $\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow$
 Z K C L U P (coded word)

YIZAPJ

(Q) $Z = 52$ and ACT = 48 then BAT will be equal to (A) 39 (B) 41 (C) 44 - (D) 46.

Sol) $Z = 52$

\downarrow
 26×2

ACT

$A - 1 \Rightarrow 1 \times 2 = 2$

$(- 3 \Rightarrow 3 \times 2 = 6)$

$7 \Rightarrow 20 \Rightarrow 20 \times 2 = 40$

Total 48

BAT

B - 2 × 2 → 4
A → 1 × 2 → 2
T → 20 × 2 → 40

⇒ 46

(Q3) In a certain code

(i) 134 means 'You are well'

(ii) 758 means 'they go home'

(iii) 839 means we were home

why the following represents 'they' in that code

Sol By analysing 8 → home

8 →

Data inadequate