

$\frac{m(m+1)}{2} \rightarrow$ sum of m natural numbers

$$\frac{m(m+1)(2m+1)}{6}$$

(i) sum = 34

$$a+b = 34$$

$$diff = 8$$

$$\underline{a - b = 8}$$

Find the product

$$x = \frac{42}{2} \Rightarrow 21$$

$$\underline{34 - 42}$$

$$\begin{array}{r} 1 \\ 4.2 + b = 3.4 \\ = 16 \end{array}$$

13

$$13 \times 21 = 273,$$

If sum & diff given use the formula

(and i) Product = $\frac{(S+D)(S-D)}{4}$

(and ii) If product is given diff given

$$the \text{sum} = \sqrt{D^2 + 4P}$$

$$P = (s+d)(s-d)$$

4th

$$P = s^2 - sd + sd - d^2$$

~~$$4P = s(s+D) - s(s-D)$$~~

~~$$4P = s^2 - D^2$$~~

$$s_2 \sqrt{4P + D^2}$$

$$s(s+D/s) \cdot s(1-D/s)$$

case (iii) :- product & sum is given, find the difference.

$$\text{Difference} = \sqrt{s^2 - 4P}$$

$$\begin{array}{r} 44 \\ 44 \\ 1616 \\ 1616 \end{array}$$

$$s\sqrt{123} \{ 24$$

$$25 \sqrt{123} \}$$

76

$$s\sqrt{137} \{ 27$$

$$(4) 1231$$

$$\left[\frac{123}{5} \right] + \left[\frac{123}{55} \right] + \frac{0}{125}$$

$$24 + 4 + 0$$

$$28,$$

$$(4) 1371$$

$$\left[\frac{137}{5} \right] + \left[\frac{5}{25} \right] + \left[\frac{132}{125} \right]$$

$$27 + 5 + 1 + 0$$

$$33$$

$$\left[\frac{137}{625} \right]$$

(4).

1123!

$$\begin{array}{c}
 \begin{array}{r}
 224 \\
 + 1123 \\
 \hline
 337
 \end{array}
 + \left[\begin{array}{r}
 44 \\
 + 1123 \\
 \hline
 25
 \end{array} \right] + \left[\begin{array}{r}
 8 \\
 + 1123 \\
 \hline
 125
 \end{array} \right] + \left[\begin{array}{r}
 1 \\
 + 1123 \\
 \hline
 625
 \end{array} \right] + \frac{1123}{70}
 \end{array}$$

$\frac{224}{8}$ $\frac{44}{8}$ $\frac{11}{25}$ $\frac{268}{48}$ $\frac{125 \times 10}{1250}$ $\frac{125 \times 9}{1125}$ $\frac{1}{125 \times 2}$
 60240 1230 1250

$$224 + \frac{44}{8} + \frac{11}{25} + \frac{1}{125} = \frac{224}{312}$$

(5) $224/5$ ~ 44.8

$$= \frac{224}{5} + \frac{225}{25} + \frac{225}{125} =$$

$$\begin{array}{r}
 2 \\
 \cancel{123} \\
 \hline
 78
 \end{array}$$

16

$$-2(a_1 + a_5) = 83.$$

4

$$\frac{2}{18} = 83$$

18

$$\begin{array}{r} 2 \ 5 \\ 3 \ 5 \\ \hline 9 \ 15 \\ 15 \end{array}$$

$$9, 30, 15$$

$$\begin{array}{r} 35 \\ 35 \\ \hline 30 \ 25 \\ 32 \ 5 \\ 1125 \end{array}$$

✓
2, 3, 4

- (i) The smallest prime no is 2 ✓ 1, 2, 3, 4, 5,
- (ii) The only even prime no is 2 unique no,
- (iii) The first odd prime no is 3
- (iv) The last composite no is 4
- (v) The least odd composite no is 9

$$(4) \quad \frac{?}{18} = 83 \quad \frac{?}{16} = 83$$

$$\text{Largest} = 95$$

$$\text{Smallest} = ?$$

1494 is even.

31

$$\underline{18 \times 83}$$

$$\begin{array}{r} 18 \\ 83 \\ \hline 8 \ 24 \end{array}$$

$$\begin{array}{r} 364 \\ 8, 64, 24 \\ 1494 \end{array}$$

(q) : average marks of 3 batches of 65, 85, 97

marks is 56, 63, 67

The average marks of all the students is

$$\frac{?}{65} = 56, \quad \frac{?}{85} = 63, \quad \frac{?}{97} = 67$$

$$\begin{array}{r} 56 \\ 65 \\ \hline 30 \end{array}$$

$$61 \quad 30$$

$$25 + 35$$

$$\begin{array}{r} 25 \\ 35 \\ \hline 61 \end{array}$$

$$\begin{array}{r} 6 \\ 30, 61, 30 \\ \hline 36 \end{array}$$

$$30$$

$$\begin{array}{r} 1 \\ 56 \\ 63 \\ \hline 67 \\ 186 \end{array}$$

$$(i) \text{ sum} = 3640$$

$$\begin{array}{r} 85 \\ 63 \\ \hline 48, 15 \end{array}$$

$$(ii) \text{ sum} = 5355$$

$$\begin{array}{r} 24 \\ 30 \\ 54 \\ \hline 48, 54, 05 \\ 55 \end{array}$$

$$(iii) \text{ sum} = 6499$$

$$55, 55, 85$$

$$\text{Total sum} = \frac{15494}{247} = 62.7$$

$$67 \quad 55$$

$$\begin{array}{r} 97 \\ 54, 149 \end{array}$$

$$65$$

$$85$$

$$97$$

$$287$$

(4) 3, 4, 6, ? had class.

$$\text{std. h.} = \frac{10, 20, 15}{+ 10, + 4, + 10} = 10, 4, 15$$

$$\begin{array}{r} 10 \\ 20 \\ \hline 15 \\ 5 \end{array}$$

$$\frac{?}{3} = 10, \quad \frac{?}{4} = 20, \quad \frac{?}{6} = 15, \quad \frac{?}{5} = 15$$

$$(i) \text{num} = 30$$

$$\frac{200}{13} = \underline{\underline{15.3}}$$

$$(ii) \text{num} = 80$$

$$(iii) \text{num} = 90$$

$$\begin{array}{r} 13 \sqrt{200} \\ \quad 13 \\ \hline 70 \\ \quad 65 \\ \hline 50 \\ \quad 45 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 13 \sqrt{153} \\ \quad 13 \\ \hline 20 \\ \quad 15 \\ \hline 39 \end{array}$$

$$(iv) 76 \neq 45$$

average of class members by $\frac{1}{2}$

no. of pupils in class?

$$(v) \frac{A+B+C}{3} = 45 \quad 13.5$$

weight of B?

$$80 + C = 135 \\ C = 135 - 80$$

$$\frac{A+B}{2} = 40$$

~~$$A+B+C = 135$$~~

$$\begin{array}{r} 135 \\ - 80 \\ \hline 55 \end{array}$$

$$\frac{B+C}{2} = 43$$

~~$$A+B = 80$$~~

$$\begin{array}{r} 86 \\ - 55 \\ \hline 31 \end{array}$$

$$C = 55 \quad 2 \\ B + 55 = 86 \\ B = 31$$

~~$$2A + 3B + 2C = 30$$~~

(Q)

$$\frac{?}{2} = 6050$$

$$\frac{P+Q}{2} = 6050 : 12100$$

$$\frac{7250 \times 2}{14500}$$

$$\frac{Q+R}{2} = 7250 \rightarrow \frac{Q+R}{2} \times 2250$$

$$\frac{P+R}{2} = 5700$$

$$P+R = 2 \times 5700$$

$$P = ?$$

$$P+R = \underline{\underline{11400}}$$

$$P = \underline{\underline{11400 - R}}$$

$$P+Q = 12100$$

$$Q+R = 14500$$

$$P+R = \underline{\underline{11400}}$$

$$2P + 2Q + 2R = 38000$$

$$2(P+Q+R) = \underline{\underline{38000}}$$

$$\begin{array}{r} 2 \\ \sqrt{38000} \\ \hline 17 \end{array}$$

$$P+Q+R = 19000$$

$$P = \underline{\underline{7250}}$$

$$P = 19000 - 14500$$

$$19000$$

$$14500$$

$$P = \underline{\underline{4500}}$$

(4) Find 10 avas.

$$\text{new rate} = 3.2$$

$$\frac{?}{60} = 3.2$$

$$\frac{282}{20} = ?$$

~~240~~

$$20 \sqrt{141}$$

$$20 \sqrt{141} 6$$

$$\begin{array}{r} 141 \\ 282 \\ \hline 0 \end{array}$$

Percentage formula

\rightarrow If A is R% more than B, then
than A by R

$$\frac{R}{R+100} \times 100$$

282

128

4

$$40 \times 3.2$$

80

$$\frac{3.2}{40}$$

$$6 = 6$$

80

126

\rightarrow If A is R% less than B, then

B is more than A by $\frac{R}{100-R} \times 100$

\rightarrow If the price of commonly used car

by R%, then reduction in consumption

not to increase the expenditure is

$$\frac{R}{R+100} \times 100$$

$$40 \times 3.2$$

80

120

128.0

out percentage rate for depreciation

Let the present value of a machine be P , suppose

it depreciates at the rate of $R\%$ per annum, then

$$\Rightarrow \text{Value of the machine after } n \text{ years} = P \left(1 - \frac{R}{100}\right)^n$$

$$\Rightarrow \text{Value of the machine } m \text{ years ago} = \frac{P}{\left(\frac{1-R}{100}\right)^m}$$

Percentage rate for population:-

Let population of town be P , suppose it increases at the rate of $R\%$ per annum, then

$$\Rightarrow \text{Population after } n \text{ years} = P \left(1 + \frac{R}{100}\right)^n$$

$$\Rightarrow \text{Population } m \text{ years ago} = \frac{P}{\left(1 + \frac{R}{100}\right)^m}$$

→ Percentage rules for successive change

→ If value of some amount is increased by $x\%$ then decreased by $y\%$ then netting effect in percent is : $\frac{+x - y - xy}{100}$

→ - " increased by $x\%$ then again increased by $y\%$

then - " is : $+x + y + \frac{xy}{100}$

→ - " decreased by $x\%$, then increased by $y\%$

then - " is : $-x + y + \frac{xy}{100}$

→ - " decreased by $x\%$, then again decreased

by $y\%$, - " is : $-x - y + \frac{xy}{100}$

(4)

$$x - y = 10 \quad 10\% x = 20\% y$$

(x > y)

$$\frac{10}{100} x = \frac{20}{100} y$$

$$0.1x = 0.2y$$

$$\begin{array}{r} 180 \times 100 \\ 006 \\ 000 \\ \hline 18000 \\ \cancel{+} \end{array} \quad \begin{array}{r} 18000 \\ \hline 0 \end{array}$$

$$(4) \quad 1,20,000 \left(\frac{1+7}{100} \right)^4 \rightarrow \frac{107}{100}$$

$$1,20,000 \left(\frac{8}{100} \right)^4$$

$$1,20,000 \left(\frac{107}{100} \right)^4$$

$100 \sqrt[4]{107}$

(4)

$$\begin{array}{r} 100 \\ 100 \\ \hline 100 \end{array} \quad \begin{array}{r} 604 \\ 60 \\ \hline 60 \end{array} \quad \begin{array}{r} 60 \\ 60 \\ \hline 60 \end{array}$$

$$\frac{36}{100} \times 100 = 180$$

$$\begin{array}{r} 18000 \\ \hline 56 \end{array}$$

$$\begin{array}{r} 180 \times 100 \\ 0 \\ \hline 18000 \end{array}$$

$$\begin{array}{r} 56 \times 2 \\ 112 \\ \hline 112 \end{array}$$

$$100 \sqrt[4]{107} \approx 107$$

$$\begin{array}{r} 107 \\ 100 \\ \hline 700 \end{array}$$

$$1.07 \times 1.02 =$$

↓ 10%

$$\begin{array}{r} \overline{345+75} \\ 225 \\ \hline \end{array}$$

$$\begin{array}{r} \underline{3375} \\ 10 \end{array} \quad \begin{array}{r} 30010 \\ 300 \\ \hline 1 \end{array} \quad \begin{array}{r} 3375 \\ 300 \\ \hline 375 \end{array}$$

3 Yen gu

~~$$\begin{array}{r} 31 \\ \times 3 \\ \hline 93 \end{array}$$~~

$$P \left(1 - \frac{Q}{100} \right)^{3x}$$

Ms 8748
45+2

$$\left(\frac{1 - R}{100} \right)^m$$

$$8748 \left(1 - \frac{10}{100}\right)^3 \frac{81 \times 9}{329}$$

$$\left(\frac{405}{100} \times 75\vartheta \right) - \frac{2.5}{100} \times 400$$

4.5 x 75

$$748 \left(\frac{100 - 16}{100} \right)^3 = 120$$

$$\left(\frac{10}{100} \right)^3$$

1000000
1000000

$$\begin{array}{r}
 45 \\
 + 5 \\
 \hline
 28
 \end{array}
 \quad
 \begin{array}{r}
 20+35 \\
 \textcircled{2} 5
 \end{array}
 \quad
 \begin{array}{r}
 55 \\
 \textcircled{5} 5
 \end{array}
 \quad
 \begin{array}{r}
 337.5
 \end{array}$$

≈ 120

3-37-5-120

6, 23 | 6 x x

6
600
72

०००००००००००००

1351
8748 x 0.702

$$\begin{array}{r}
 100.0 \\
 \times 0.2 \\
 \hline
 200.0
 \end{array}$$

o. 729
7444

$$\left(\frac{56}{100} \times 870 \right) + \left(\frac{82}{100} \times 180 \right) = \frac{32}{100} (96 + ?)$$

$$(5.6 \times 87) + (8.2 \times 18) = 0.32 \frac{3.2 \times 9}{87 - 8 + ?}$$

$$476 + 147.6$$

15

$$623.6 =$$

$$l - A$$

$$\frac{23}{510}$$

$$487.2 + 147.6$$

$$\frac{425 \times}{4760}$$

$$634.8$$

$$= (90 + x) \cdot 32$$

$$\frac{18 \times 8.2}{36}$$

$$634.80$$

$$\frac{144 \times}{147.6}$$

$$1983.75$$

$$= 90 + x$$

$$\frac{476}{623.6}$$

$$x = 18.93,$$

$$623.6$$

$$18.8$$

$$P(1 + \frac{R}{100})^n$$

Sum =

$$S_3 = 815 \text{ in 3 yrs}$$

$$S_3 = 854 \text{ in 4 yrs}$$

$$S_3 = \frac{P_{TR}}{100^n}$$

Sum P.

$$\frac{P_{TR}}{100^n}$$

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

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

$$\frac{P_{TR}}{100} \times \frac{1500}{100} = P_{TR}$$

$$\frac{1500 \times R^2}{100}$$

S₄

$$S_4$$

$$S_4 = 15 \times R^2$$

~~$\frac{S_4}{10}$~~

~~$\frac{S_4}{10}$~~

a.

b.

$$\frac{15 \times 10}{100} \times S_4 + P. 15 \times (S_4)^2$$

$$\frac{S_4}{10} = 15$$

$$21360$$

$$\frac{246 \times}{3680}$$

$$R^2 = 55$$

$$S_4 = 15 \times$$

$$S_4 = \frac{15 \times 10 \times R^2}{100}$$

$$\begin{array}{r} 21 \\ 540 \times 540 \\ \hline 000 \\ 272160 \end{array}$$

~~$\frac{540}{1536} = 36\%$~~

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 ~~$\frac{540}{1536} = 36\%$~~

 ~~$\frac{540}{1536} = 36\%$~~

 ~~$\frac{540}{1536} = 36\%$~~

$$\begin{array}{r} a \\ b \\ 36 \\ 180 \\ \hline 540 \\ 15 \\ \hline 1 \end{array}$$

$$\frac{100}{540}$$

$$\frac{2}{15}$$

$$\begin{array}{r} 15 \\ 15 \sqrt{540} \\ \hline 1 \end{array}$$

$$\frac{540}{15}$$

$$P = 10,000$$

$$T = 2.$$

$$R = 4$$

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

$$P_2?$$

75

$$S.I = 815 \text{ in } 3 \text{ yrs}$$

$$S.I = 854 \text{ in } 4 \text{ yrs!}$$

38

$$A.m.t_1 = 815 \rightarrow 3 \text{ yrs}$$

$$A.m.t_2 = \underline{\underline{854}} \rightarrow 4 \text{ yrs}$$

$$\textcircled{39} \leftarrow 1 \text{ yr}$$

$$\begin{array}{r} 854 \\ - 815 \\ \hline 39 \end{array}$$

$$S.o.p, 15\% p.a.$$

$$I. 7.5$$

$$R.D = 6.5\%$$

$$E. 30.1\% 32$$

$$A.m.t_1 = 815 \rightarrow 3 \text{ yrs} \quad A.m.t_1 = P + S.I_1$$

$$A.m.t_2 = 854 \rightarrow 4 \text{ yrs} \quad A.m.t_2 = P + S.I_2$$

$$A.m.t_2 - A.m.t_1 = P + S.I_2 - (P + S.I_1)$$

$$\cancel{39} = S.I_2 - S.I_1$$

$$\cancel{S.I_2} - S.I_1 = 39$$

$$\frac{APR - IPR}{100} \times \frac{39}{100} = 39$$

$$\frac{P \times R \times T}{100} - \frac{P \times R \times T}{100} = 39$$

$$\frac{IPR}{100} = 39$$

$$\frac{P \times R \times 4}{100} - \frac{P \times R \times 3}{100} = 39$$

$$IPR = 3900$$

(7) A certain amount can be distributed among a, b, & c. in the ratio 3:4, but was wrongly divided 7:2:5, as a result b got 40 rs less; what was the amount?

- (a) 210 (b) 270 (c) 230 (d) 280 (e) none

(8) 1080 kg of sugar are to be worth 1000 rupees

$$\frac{3}{4}x \quad 2x \quad P:Q$$

~~$\frac{7}{4}x$~~

~~Wt~~
~~rupe~~

Ratio's proportion

$$P=50$$

$$\begin{array}{ccc} 3x & & 2x \\ 1 \rightarrow 6000 & & 5:1:3 \\ 2 \rightarrow 8000 & & \end{array}$$

$$5+1+3 = 1300$$

(9) 3 person got the money in the ratios $\frac{3}{4}:2:\frac{5}{2}$, if total sum is 133020, what is the most share. ~~one person gets~~

$$\frac{3}{4}x + \frac{2}{4}x + \frac{5}{8}x = 133020$$

$$\begin{array}{r} 212+52 \text{ g.} \\ 133020 \\ \hline 9 \end{array}$$

(Q) He starts business with Rs 45000 & joins after 3 months with Rs 30,000, what will be the ratio by which share of the year.

$$x = 45000 \times 12$$

$$y = 30000 \times (12 - 3)$$

$$\cancel{45000} : \cancel{30000}$$

$$45 \times 12 : 30 \times 9$$

$$540 : 270$$

$$2:1$$

$$45, 13, 10$$

540

(Q) 2201000 : 21000 $\times 12$

$$y = 17500 \quad 17500 \times 12$$

$$\text{Ans} 23640.$$

$$\frac{21}{252}$$

$$2520 : 210$$

$$150 : 175$$

$$\frac{2100}{}$$

~~7. 5. 4.~~

$$x \times y = 2223$$

19 : 13.

$$19x + 13y = 2223$$

$$\cancel{19} \cdot 19 \times 13x^2 = 2223$$

1 : 2.

$$19 \cdot 13 = 247$$

19x : 247

1 - 5x : 13

$$x^2 = \frac{2223}{19 \times 13}$$

$$\frac{1}{7} \dots$$

$$\begin{array}{r} 19 \\ 13 \\ \hline 16 \\ 2 \end{array} \quad 27$$

93

$$x^2 = \frac{2223}{247}$$

$$x = \sqrt{247}$$

2 4 7

247

$$\begin{array}{r} 247 \\ 37 \\ 37 \end{array}$$

3 : 1 : 3 = 4

$$1 : 2 = r$$

$$7x = 6r = 15$$

$$5b +$$

$$15 : 2 \times 15 = 5 : 6$$

$$15 : 30 = 5 : 6$$

~~3 : 6 :~~

2

$$5 : 10 : 3 : 6$$

$$(\textcircled{4}) \quad x - y = 16$$

$$\begin{aligned} (3x + 6) &= 3y \\ 3(x - 1) &\quad \cancel{+ 3} \\ x - 1 &= y \\ x - y &= 16 \\ x - y &= 2 \\ \hline x &= 18 \end{aligned}$$

$$3x - 6 = 3y$$

$$x - 2 = y$$

$$x - y = 2.$$

$$x - y$$

$$2x - 2$$

15

$$B - 3 = A$$

$$B - 3 = A = 3$$

$$B - 3 = 5$$

∴

$$B - 5 ? \quad A - 4 = 34$$

$$3 + A$$

$$3 + A - 5 : \quad A - 4 = 34$$

$$(B = A + 3)$$

$$\frac{4B - 30}{3} = A$$

$$\frac{B - 5}{A + 4} = \frac{3}{4}$$

$$B = \frac{4B - 30 + 3(A + 4)}{3}$$

$$B = \frac{4B - 30 + 9 + 12}{5}$$

$$4B - 20 = 3A + 12$$

$$4B - 3A = 12 + 20 \Rightarrow$$

$$4B - 3A = 32. \quad \text{Q.E.D.}$$

~~$$18 + 20 = 35$$

$$18 \text{ days} \rightarrow 300$$~~

4

$$\frac{1}{18} + \frac{1}{20} = \frac{18+20}{300} = \frac{35}{300} = \frac{7}{60}$$

$$\frac{7}{60} \times 4 = \frac{28}{60} = \frac{7}{15}$$

$$\frac{7}{15} - 1 = \frac{7-15}{15} = \frac{-8}{15}$$

1 -

$$38 \times 20 \\ 20 \\ \hline 60$$

$$1 - \frac{2}{15}$$

$$A = 10 \cdot \frac{15-7}{15} = \frac{8}{15}$$

$$A + B = 15$$

$$B = 20$$

$$A =$$

$$A + 20 = 15$$

$$20 - 5 = A$$

$$5 = A$$

$$A + B = 15$$

$$\frac{1}{15} - \frac{1}{20} = \frac{1}{60}$$

$$20 + C = 18$$

$$C = 38$$

$$A = 20.$$

$$B = 11$$

$$A + B = 9 \quad \text{in how many days will } A, B, C \text{ finish it together}$$

$$B + C = 12, \quad \text{days will } A, B, C$$

$$A + C = 18 \quad \text{finish it together}$$

$$\frac{1}{A} + \frac{1}{B} = 9, \quad B = C - 15$$

$$C = 18 - A$$

$$\frac{1}{A} + \frac{1}{18-A} = 9$$

$$\frac{18-A+A}{18-A} = 9$$

$$\frac{18}{A} = 9, \quad A = 2$$

$$A=3$$

$$B=3$$

$$A+B+C = 2000$$

$$\frac{1}{4} + \frac{1}{8} = \frac{1+2}{48} = \frac{3}{48} = \frac{1}{16}$$

$$\frac{7}{24} + \frac{1}{3} = \frac{21+24}{72} = \frac{45}{72}$$

50.

$$\frac{45}{52}$$

PSC

(Q) $P \text{ of } 1 = 1$

$$1 \text{ black pair} = 3x$$

$$brown pair = b$$

$$black: 5x + 3x = 15x$$

$$brown: b \times 2 = 2b$$

$$total = (5x + 3x) + (15 + b)x$$

$$\rightarrow 3bx + 5x$$

$$3bx + 5x = 2 \times (15 + b)x$$

$$3b + 5 = 30 + 2b$$

$$3b - 2b = 30 - 5$$

$$b = 25$$

(Q) brown black.

$$\rightarrow 1cm \rightarrow \text{key}$$

$$C(8,2) + C(3,2) = 28 + 3 = 31$$

$$6+1 = 67$$

$$\Rightarrow 21, 31, 67 \dots$$

(P) $T_1 \neq T_5$

$P_1 \neq P_5$

$P_3 \text{ or } P_4 \rightarrow 2$

$$\Rightarrow 3 \times 2 \times 6 = 36$$

(Q) 24 handshakes

$$m \times n = 24$$

$$m_{c_2} \div n_{c_2}$$

$$m \times n = 24$$

$$m = 6, n = 4 = 6 \times 4 = 24$$

$$(6, 2) \div (4, 2) = 15 + 6 = 21$$

$$m = 8, n = 3 \Rightarrow 8 \times 3 = 24$$

$$(8, 2) \div (3, 2) = 28 + 3 = 31$$

$$m = 12, n = 2 \Rightarrow 12 \times 2 = 24$$

$$(12, 2) \div (2, 2) = 66 + 1 = 67$$

$\Rightarrow 21$

(Q) MATHEMATICS

$L = 11$

$A(2), n(2)$

$V = A, E, A, T = f$

$C = M, T, H, M, T, C, S, = 7$

$$(A \in I) [M + 1 \in M_{T+1}]$$

vards
com

$$8 \times 7 \times 6 \times 5 \times 4 !$$

$M \in T$ expected

$$\frac{8!}{2! \cdot 2!} = \frac{40320}{4} = 10080$$

$$\textcircled{2} \quad (I, E, A, I) = \frac{4!}{2!} = \frac{24}{2} = 12$$

$$\cancel{10080} \times 12 = 120960$$

Q2 OPTICAL (7)

OIA (3 vards)

com (P, Tc, L-4)

$$(O, I, A) = 3! = 6$$

$$\frac{120 \times 6}{2} = 720$$

$$\textcircled{3} \quad \cancel{30} \times 6 = \frac{30 \cdot 29}{2} = 435$$

Q4 LOGARITHMS = 10

4 from 10

$$\log_4 = \frac{10!}{4!(10-4)!} = \frac{532}{\cancel{4} \times \cancel{3} \times \cancel{2} \times (6)!} = 210$$

$$\text{Int} \omega = 216 \times 24 = 5040$$

(9) 2 loops & 2 girls

$$26+2$$

$$\text{Ans: } C(2,1) = 2$$

$$C(3,1) = 3$$

Ans 1 -

$$C(3,1) = 3$$

$$C(2,1) = 2$$

$$\Rightarrow 2 \times 3 \times 3 \times 2 = \frac{36}{2}$$

Ans 26 $\rightarrow \omega \rightarrow 2$ girls

$$C(2,2) = 1$$

$$C(2,2) = 1$$

$$1 \times 1 = 1$$

$$\Rightarrow C(3,2) = 3$$

$$C(3,2) = 3$$

$$3 \times 3 = 9$$

$$\Rightarrow 3 + 1 + 9 = 14$$

$$= \frac{66}{2}$$

Avg., probabilities & time

Q: $A = \frac{1}{20}, B = \frac{1}{30}, C = \frac{1}{60}$

$C(M=60)$

$$A \text{ each above} = 2 \times \left(\frac{1}{20}\right) = \frac{2}{20} = \frac{1}{10}$$

$$A + B + C = \left(\frac{1}{20} + \frac{1}{30} + \frac{1}{60}\right)$$

$$A = \frac{3}{60}, B = \frac{2}{60}, C = \frac{1}{60} = \frac{6}{60} = \frac{1}{10}$$

$$\Rightarrow \frac{1}{10} + \frac{1}{10} = \frac{1}{5}$$

$$3 \times 5 = 15$$

Q: $A = \frac{1}{6}, B = \frac{1}{8}$

$$A + B + C = \frac{1}{3}$$

$$\Rightarrow \left(\frac{1}{6} + \frac{1}{8} + C\right) = \frac{1}{3}$$

$$C(M=24)$$

$$\Rightarrow (4+3)/24 + C = \frac{1}{3}$$

$$7/24 + C = 8/24$$

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

60	2	20, 30, 60
30	2	10, 15, 30
15	3	5, 15, 15
5	5	5, 5, 5

24	2	6, 8, 3
12	3	3, 4, 3
6	2	3, 2, 3
3	3	3, 1, 3