

R S Agarwal Bit to Bit by Sagar Sir @Spoorthy Ashok Nagar- 6303450967

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# ARITHMETIC (R.S. AGGARWAL)

## BOOK (BIT TO BIT)

BY



శిజయ్ నాగర్ Sir,  
IIT, Kharagpur

### 40 Days Batch

Attend Free Demo tomorrow @ 2 pm

**SPOORTHY**  
(Study Circle)

2nd Floor, Opposite to Brundavan Hotel, Near  
Sudharshan Theatre, RTC X - Ashok Nagar Road

**6303450967**

R S Agarwal Bit to Bit by Sagar Sir @Spoorthy Ashok Nagar- 6303450967



# TIME & WORK

టోలో-పరీ

## CONCEPTS:

Q1 A - 12 రోజుల చేస్తాడు

B - 15 రోజుల్లో 2 రపని చేస్తాడు వొరిధ్దవు

కెలసి మొత్తం ఎన్ని ఏన్నిరోజుల్లో చేయగలవు?

Method 1:

$$A \text{ రోజుల ఘట } = \frac{1}{12}$$

$$B \text{ రోజుల ఘట } = \frac{1}{15}$$

$$A \& B = \frac{1}{12} + \frac{1}{15} \Rightarrow \frac{5+4}{60}$$

$$= \frac{9}{60} = \frac{3}{20} \Rightarrow \frac{1}{20/3}$$

$$= \frac{20}{3} \text{ రోజుల } = 6\frac{2}{3} \text{ రోజులా.$$

Method 2:

$$8 \times \text{సామాన్య} = 12$$

$$A \quad 12 \times 5 = 60$$

$$B \quad 15 \times 4 = 60$$

$$A \& B \quad \frac{20}{3} \quad \frac{3}{9} = 60$$

$$A \& B \text{ రోజుల } = \frac{\text{మొత్తం రోజు}}{A \& B \text{ సామాన్య}}$$

$$= \frac{60}{9} = \frac{20}{3}$$

Q2 రోజుల x సామాన్య = 12

$$A \quad 12 \times 5 = 60$$

$$B \quad 10 \times 6 = 60$$

$$A \& B \quad 11 = 60$$

$$A \& B = \frac{60}{11} = 5\frac{5}{11}$$

కెసాగు = 60

కెసాగు = 60

Q3

$$8 \times \text{సామాన్య} = 15$$

$$A \quad 15 \times 1 = 15$$

$$B \quad ? \times 4 = 15$$

$$A \& B \quad 3 \times 5 = 15$$

$$B \text{ రోజుల } = \frac{\text{మొత్తం}}{\text{B సామాన్య}} = \frac{15}{4} = 3\frac{3}{4}$$

Q4

$$\text{రోజుల } \times \text{సామాన్య} = 12$$

A	$\frac{10}{3}$	3	= 30
B	5		
A & B	?		

x ఈ తోపంచాల.

$$\text{Ans: } 8 \times \text{సామాన్య} = 12$$

$$A \quad 10 \times 3 = 30$$

$$B \quad 15 \times 2 = 30$$

$$A \& B \quad \times 5 = 30$$

$$A \& B = \frac{30}{5} = \frac{60}{6} = 10 \text{ రోజుల } \times \frac{1}{2} = 20 \text{ రోజులా}$$

\* ఇవిన తసించాంకాను 3 తో భాగించాల.

Q5

$$\text{రోజుల } \times \text{సామాన్య} = 12$$



$$10 \times 6 = 60$$

కెసాగు

10, 12, 15

$$12 \times 5 = 60$$

= 60

$$15 \times 4 = 60$$

$$A \& B \quad 4 \times 15 = 60$$

$$A \& B \text{ రోజుల } = \frac{\text{మొత్తం}}{A \& B \text{ సామాన్య}} = \frac{60}{15} = 4 \text{ రోజులా}$$

Q6

$$\text{రోజుల } \times \text{సామాన్య} = 24$$

కెసాగు

24, 12, 3

$$A \quad 24 \times 1 = 24$$

= 24

$$B \quad 12 \times 2 = 24$$

= 24

$$C \quad ? \times 5 = 24$$

= 24

$$A \& B \quad 3 \times 8 = 24$$

కెసాగు

15, 3

15 కెసాగు

$$\text{రోడు} = \frac{24}{5} = 4 \frac{4}{5} \text{ రోడు}$$

Q7 A-15 రోడు, B-10 రోడులలో ఒక వసిచేస్తారు.

AB ల ఇంద్రుడు 3 రోడుల వనిచేసిన తర్వాత A వెళ్ళాల్సి విగత వని B వసిశీలులలో చేయగలదు?

$$3 \times 2 = \text{వని}$$

$$15 \times 2 = 30$$

$$10 \times 3 = 30$$

$$\text{AB } (6) \times 5 = 30$$

$$16B 3 \text{ రోడుల వని} = 3 \times 5 = 15 \text{ చిత్తం}$$

$$\text{విగతావని} 30 - 15 = 15 \text{ రోడు}$$

$$5 \text{ రోడు} = \frac{15}{\text{B కొమ్మా}} = \frac{15}{3} = 5 \text{ రోడు}$$

Q8 A-24 రోడుల్లో, B-8 రోడుల్లో ఒక వసిచేస్తారు. నీటికి 5 రోడుల వనిచేసిన తర్వాత B కుడా A తో ఉన్న ఇంద్రుడు విగతావని వసిశీలుల్లో చేస్తారు.

$$3 \times 8 = \text{వని}$$

$$24 \times 1 = 24$$

$$8 \times 3 = 24$$

$$\text{AB } 4 \times 1 = 24$$

$$5 \text{ రోడుల వని} = 5 \times 1 = 5 \text{ buildings}$$

$$\text{విగతావని} = 24 - 5 = 19 \text{ building}$$

$$A \oplus B \text{ రోడు} = \frac{19}{\text{AB కొమ్మా}} = \frac{19}{4} = 4 \frac{3}{4} \text{ ||}$$

Q9 A-40, B-50 రోడుల్లో ఒక వసిచేస్తారు.

A B ఇంద్రుడు ఒకతరలం వనిచేసిన తర్వాత 5 వెళ్ళాల్సి దాడు. విగతావని గా 23 రోడులు వని పూర్తి చేస్తాడు. ఇంద్రుడు ఒకతరలం వని చించాలు / బంతరలం తర్వాత B వెళ్ళాల్సి దాడు.

$$\begin{array}{r} \text{రోడు} \times \text{కొమ్మా} = \text{వని} \\ \hline A \quad 40 \times 5 = 200 \\ B \quad 50 \times 4 = 200 \\ \hline A \oplus B \quad 9 = 200 \end{array}$$

$$\begin{array}{r} \text{కొమ్మా} \\ \hline 40, 50 \\ = 200 \end{array}$$

$$\text{మిగతావని} = A 23 \text{ రోడు}$$

$$= 23 \times 5$$

$$= 115 \text{ చిత్తం}$$

$$\text{విందువువని} = 200 - 115 = 85 \text{ చిత్తం}$$

$$A \oplus B \text{ రోడు} = \frac{85}{\text{A \oplus B కొమ్మా}} = \frac{85}{9} = 9 \frac{4}{9}$$

Q10 A-10, B-12, C-15 రోడులలో ఒక వసిచేస్తారు. AB ఇంద్రుడు ఒకతరలం వనిచేసిన తర్వాత B సెధనంలో C వు ఉండు. AC ఇంద్రుడు ఒకతరలం విగతావని వసిశీలుల్లో చేస్తారు.

$$3 \parallel \times 6 \parallel = \text{వని}$$

$$A \quad 10 \times 6 = 60$$

$$\text{కొమ్మా}$$

$$\boxed{10, 12, 15}$$

$$B \quad 12 \times 5 = 60$$

$$= 60$$

$$C \quad 15 \times 4 = 60$$

$$\text{ABC } (4) \times 15 = 60$$



$$AB \text{ ఇంద్రుడ ఒకతరల వని} = 11 \times 3 = 33 \text{ చిత్తం}$$

$$\text{విగతావని} = 60 - 33 = 27 \text{ చిత్తం}$$

$$A \oplus B \text{ రోడు} = \frac{27}{\text{ABC కొమ్మా}} = \frac{27}{10} = 2 \frac{7}{10}$$

Q11 A-10, B-12, C-15 రోడులలో ఒక వసిచేయాలి. గురువు ABC వని పొదవుపై వు పూర్తి వుండాలి? ఒకఱు మంచు B, రెండు రోడుల మంచు C తో చెరియడాలి. ప్రయత్నించి వుండాలి ప్రయత్నించాలి?

$$3 \times 6 \parallel = \text{వని}$$

$$A \quad 10 \times 6 = 60$$

$$\text{కొమ్మా}$$

$$\boxed{10, 12, 15}$$

$$B \quad 12 \times 5 = 60$$

$$= 60$$

$$C \quad 15 \times 4 = 60$$

$$\text{ABC } (4) \times 15 = 60$$

ఎని లెగదసంకి కోణాల వ్యాపారం.

	A	B	C
కోణాల	$x$	$(x-1)$	$(x-2)$
కోణాల కొత్తంగాల	6	5	4

$$\text{కొత్తం} = 6x + 5(x-1) + 4(x-2) = 60$$

$$15x - 5 - 8 = 60$$

$$15x = 73$$

$$x = \frac{73}{15} = 4\frac{13}{15}$$

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### ప్రమాదాలు : [Concepts :]

Q1 A అనీ లతను B కంటే 10డిగ్రీల సామాన్యం

గలవాడు. నీరపనికి B 18 రోధాల తీసుకుంటే

A రోధాల ? AB రోధాల ?

$$\text{కోణాల} \times \text{సామాన్యం} = \text{వ్యాపారం}$$

$$9 \times 2 = 18$$

$$B \quad 18 \times 1 = 18$$

$$A \oplus B \quad 6 \times 3 = 18$$



Q2 A అనీ లతను B కంటే 10డిగ్రీల అధికం

సామాన్యంగాలవాడు. నీరపనికి A 6 రుద్దరూ 12 రోధాలు

నమరించు తీసుటంటే A రోధాల ? B రోధాల ?

$$\text{కోణాల} \times \text{సామాన్యం} = \text{వ్యాపారం}$$

$$A \quad 16 \times 3 = 48$$

$$B \quad 48 \times 1 = 48$$

$$A \oplus B \quad 12 \times 4 = 48$$

Q3 A అనీ లతను B కంటే 25% ఎక్కువ

సామాన్యంగాలవాడు. నీరపనికి B 20 రోధాలు

తీసుటంటే కోణాల ? AB రోధాల ?

$$A : B \text{ సామాన్యం} = \frac{5}{125} : \frac{4}{100} \quad (25\%)$$

5 : 4

$$\text{కోణాల} \times \text{సామాన్యం} = \text{వ్యాపారం}$$

$$A \quad 16 \times 5 = 80$$

$$B \quad 20 \times 4 = 80$$

$$\underline{A \oplus B \quad \frac{80}{9} \times 9 = 80}$$

$$= \frac{80}{\cancel{x}} = 72\frac{8}{9}$$

Q4 A అనీ లతను B కంటే 16.66% అధికసామాన్యం గలవాడు. నీరపనికి B 42 రోధాల తీసుకుంటే కోణాలు

$$A \quad 36 \times 7 = 252$$

$$B \quad 42 \times 6 = 252$$

$$\underline{A \oplus B \quad \frac{18\frac{8}{13}}{x} \times 13 = 252}$$

$$A = \frac{252}{\cancel{x}} = 36, B \oplus A = \frac{252}{13} = 18\frac{8}{13}$$

$$\begin{aligned} A : B &= \\ &= 100\% + 16.66\% : 100\% \\ &= \cancel{100\%} + \cancel{16.66\%} \end{aligned}$$

$$\begin{aligned} &1 + \frac{1}{6} : 1 \\ &= \left( \frac{7}{6} : 1 \right) \times 6 \\ &= 7 : 6 \end{aligned}$$

Q5 A అనీ లతను B కంటే 14.28% తక్కువసామాన్యం గలవాడు. నీరపనికి B 35 రోధాల తీసుకుంటే కోణాల ?

$$A : B \text{ సామాన్యం} = 100\% - 14.28\% : 100\%$$

$$= 1 - \frac{1}{7} : 1$$

$$= \left( \frac{6}{7} : 1 \right) \times 7$$

$$= 6 : 7$$

$$\text{కోణాల} \times \text{సామాన్యం} = \text{వ్యాపారం}$$

$$A \quad \circlearrowleft \times \frac{6}{7} = 245$$

$$B \quad 35 \times 7 = 245$$

$$\underline{A \oplus B \quad 13}$$

$$A \text{ రోధాల} = \frac{245}{\cancel{x}} = 40\frac{5}{6} \text{ రోధాలు}$$

# R.S. Aggarwal Book

)  $\text{రోజు} \times \text{సాపుర్యం} = \text{వీరి}$

$$\begin{array}{r} A \quad 10 \times 3 = 30 \\ B \quad 15 \times 2 = 30 \\ \hline AB \quad 6 \times 5 = 30 \end{array}$$

కణాను

$$\begin{array}{r} |10, 15| \\ = 30 \end{array}$$

$$ABC\text{రోజు} = \frac{\text{వీరి}}{\text{ABసాపుర్యం}} = \frac{30}{5} = 6$$

)  $\text{రోజు} \times \text{సాపుర్యం} = \text{వీరి}$

$$\begin{array}{r} A \quad 18 \times 1 = 18 \\ B \quad 9 \times 2 = 18 \\ \hline AQB \quad 6 \times 3 = 18 \end{array}$$

$$1\text{ ఏటి} (A+B) = 6\text{ రోజు}$$

$$AQB\text{ రోజుమార్గం} = \frac{1}{6}\text{ విషంతు}$$

)  $\text{రోజు} \times \text{సాపుర్యం} = \text{వీరి}$

$$\begin{array}{r} A \quad 9 \times 2 = 18 \\ B \quad 6 \times 3 = 18 \\ \hline AB \quad 5 = 18 \end{array}$$

$$AQB = \frac{\text{వీరి}}{\text{ABసాపుర్యం}} = \frac{18}{5} = 3\frac{3}{5} \text{ రోజులు}$$

)  $\text{రోజు} \times \text{సాపుర్యం} = \text{వీరి}$

$$\begin{array}{r} A \quad 24 \times 1 = 24 \\ B \quad 6 \times 4 = 24 \\ C \quad 12 \times 2 = 24 \\ \hline ABC \quad 7 = 24 \end{array}$$

$$ABC\text{రోజు} = \frac{\text{వీరి}}{\text{ABCసాపుర్యం}} = \frac{24}{7} = 3\frac{3}{7}$$

)  $\text{రోజు} \times \text{సాపుర్యం} = \text{వీరి}$

$$\begin{array}{r} A \quad 15 \times 20 = 300 \\ B \quad 20 \times 15 = 300 \\ C \quad 25 \times 12 = 300 \\ \hline ABC \quad 47 = 300 \end{array}$$

$$ABC\text{రోజు} = \frac{\text{వీరి}}{\text{ABCసాపుర్యం}} = \frac{300}{47} = \approx 6.4\text{ రోజులు}$$

6)  $\text{రోజు} \times \text{సాపుర్యం} = \text{వీరి}$

$$\begin{array}{r} A \quad 5 \times 3 = 15 \\ B \quad ? \quad 2 = 15 \\ \hline AB \quad 3 \times 5 = 15 \end{array}$$

$$B\text{రోజు} = \frac{\text{వీరి}}{B\text{సాపుర్యం}} = \frac{15}{5} = 7\frac{1}{2}$$

7)  $\text{రోజు} \times \text{సాపుర్యం} = \text{వీరి}$

$$\begin{array}{r} A \quad 16 \times 3 = 48 \\ B \quad \cancel{12} \times 4 = 48 \\ C \quad ? \quad 5 = 48 \\ \hline ABC \quad 4 \times 12 = 48 \end{array}$$

$$C\text{రోజు} = \frac{\text{వీరి}}{\text{Cసాపుర్యం}} = \frac{48}{5} = 9\frac{3}{5}$$

$\text{రోజుల నిష్పత్తి} \propto \frac{1}{\text{సాపుర్యం నిష్పత్తి}}$

అను రోజుల నిష్పత్తి అనేది సాపుర్యం నిష్పత్తికి క్లెప్పి వును చూతంలేది - దీంటంది.

Ex:  $\text{రోజు} \times \text{సాపుర్యం} = \text{వీరి}$

$$\begin{array}{r} A \quad 10 \quad 3 = \\ B \quad 15 \quad 2 = \\ \hline AQB \quad 5 = \end{array}$$

$$A:B\text{ల రోజుల నిష్పత్తి} = 10:15 = 2:3$$

$$A:B\text{ల సాపుర్యం నిష్పత్తి} = 3:2 = 3:2$$

అనగా వ్రాతిర్థిమి/ విలోపువాతంల్ని లుంది.

కణాను

$$\begin{array}{r} |15, 20, 25| \\ = 300 \end{array}$$

\*\*\*\*\*

(8)

$$A:B \text{ సమయం} = (2:1)_{x_3} \quad 6:3$$

$$A:C \text{ సమయం} = (3:1)_{x_2} \quad 6:2$$

$$A:B:C \text{ సమయం} = 6:3:2$$

$$= \frac{6}{6} : \frac{3}{6} : \frac{2}{6}$$

$$\text{రోజులనిష్పత్తి} = \frac{1}{1} : \frac{1}{2} : \frac{1}{3}$$

$$\text{సామాన్యంనిష్పత్తి} = 1:2:3$$

$$8 \times 6 = 48$$

$$A \quad 10 \times 1 = 10$$

$$B \quad \frac{6}{4} \times 2 = 12$$

$$C \quad \frac{4}{4} \times 3 = 12$$

$$A+B+C \times 6 = 12$$

(9)

(x)

$$\frac{1}{4}\omega = 10$$

(y)

$$40\% \omega = 40$$

$$\frac{2}{5}\omega = 40$$

$$\omega = 100$$

(z)

$$\frac{1}{3}\omega = 13$$

$$\omega = 39$$

\* = అనేక తర్వాతిశ్యామల్లి చేయగలడు.

(10)

Pages/hour	P	Q	R
	x	y	z
40			
	x	y	z

$$(i) \quad 40 \rightarrow 216 \text{ pages}$$

$$40 = x+y+z = \frac{216}{4} = 54 \text{ pages}$$

$$(ii) Q+R \text{ తేడా} = P \text{ తేడా}$$

$$z-y = y-x$$

$$2y = x+z$$

$$(iii) 50 R \text{ pages} = 70 P \text{ pages}$$

$$5z = 7x$$

x	y	z	(i)	(ii)	(iii)
---	---	---	-----	------	-------

a	14	17	20		
---	----	----	----	--	--

b	15	17	22		
---	----	----	----	--	--

c	15	18	21	✓	✓
---	----	----	----	---	---

d	16	18	22		
---	----	----	----	--	--

(11) \* వ్రాసి సమానం చేయండి  $|30.40 = 160$

$$A (32 \text{ pages}) \quad 60 \text{ రూ.} \times 5$$

$$B (40 \text{ pages}) \quad 50 \text{ రూ.} \times 4$$

$$A \quad 160 \text{ pages} \quad 30 \text{ రూ.}$$

$$B \quad 160 \text{ pages} \quad 20 \text{ రూ.}$$

$$A \quad 30 \times 2 = 60$$

$$B \quad 20 \times 3 = 60$$

$$AB \quad 5 = 60$$

$$A \oplus B = \frac{60}{5} = 12 \text{ రూ.}$$

$$160 \text{ Pages} \rightarrow 12 \text{ రూ.}$$

$$110 \text{ Pages} \rightarrow ? = \frac{110 \times 12}{160} = \frac{33}{4} = 8 \frac{1}{4}$$

$$= 8 \text{ రూ.} 15 \text{ గ్రహించాలి.}$$

Q formula:

A లక్షితము AB క్రంతిపెట్టి a రీ. ఎమర్గా, B అనే

అతను AB క్రంతిపెట్టి b రీ. ఎమర్గా తీసుకుంటి.

$$AB \text{ లక్షితము} = \sqrt{ab} \text{ రీ.ఎమ.$$

(12)

$$A \text{ అధికారికా} \quad a = 8$$

$$B \text{ అధికారికా} \quad b = 4.5$$

$$A = 6+8 = 14$$

$$B = 6+4.5 = 10.5$$

$$\begin{aligned} \text{ABC} &= \sqrt{ab} \\ &= \sqrt{8 \times 4.5} \\ &= \sqrt{36} \\ AB &= 6 \text{ రోడులు} \end{aligned}$$

∴

	గుండయ	$\times$	సామాన్యం	= ఏప్	కెసాగు
A	96	$\times$	5	=	<u>96,80</u>
B	80	$\times$	6	=	= 480
ABC				11	

$$\begin{aligned} \text{రోడు} &= \frac{60}{11} = 5\frac{5}{11} \\ &= \frac{60}{11} = 5\frac{5}{11} \end{aligned}$$

5

		$\times$		$\times$	
		8		8	
AB	10	$\times$	6	=	60
BC	12	$\times$	5	=	60
CA	15	$\times$	4	=	60
2(ABC)			15	=	60
ABC			<u>15</u>	<u>2</u>	<u>7.5</u>

$$\begin{aligned} \text{సామాన్యం} &= (\text{ABC సామాన్యం}) - (\text{BC సామాన్యం}) \\ &= 7.5 - 5 \\ &= 2.5 \Rightarrow \frac{5}{2} \end{aligned}$$

$$\begin{aligned} \text{సామాన్యం} &= (\text{ABC}) - (\text{CA}) \\ &= 7.5 - 4 \Rightarrow 3.5 \Rightarrow \frac{7}{2} \end{aligned}$$

$$\begin{aligned} \text{సామాన్యం} &= (\text{ABC}) - (\text{AB}) \\ &= 7.5 - 6 \Rightarrow 1.5 \Rightarrow \frac{3}{2} \end{aligned}$$

$$\text{ABC} = \frac{\text{మొ}}{\text{ABC సాగు}} = \frac{60}{\frac{15}{2}} = 8 \text{ డిగ్రీలు}$$

$$\text{ABC} = \frac{\text{మొ}}{\text{A సాగు}} = \frac{60}{\frac{5}{2}} = 24 \text{ డిగ్రీలు}$$

$$\text{ABC} = \frac{\text{మొ}}{\text{B సాగు}} = \frac{60}{\frac{7}{2}} = \frac{120}{7}$$

$$\text{ABC} = \frac{\text{మొ}}{\text{C సాగు}} = \frac{60}{\frac{3}{2}} = 40 \text{ డిగ్రీలు}$$

14

	$\times$	8	$\times$	5	= ఏప్	కెసాగు
AB	12	$\times$	5	=	60	<u>12,15,20</u>
BC	15	$\times$	4	=	60	= 60
CA	20	$\times$	3	=	60	
2(ABC)			12			
ABC			<u>12</u>	<u>2</u>	<u>6</u>	

$$\text{ABC} = \frac{\text{మొత్తం}}{\text{ABC సామాన్యం}} = \frac{60}{6} = 10 \text{ డిగ్రీలు}$$

15

	$\times$	8	$\times$	3	= ఏప్	కెసాగు
AB	8	$\times$	3	=	24	<u>24</u>
BC	12	$\times$	2	=	24	
CA	12	$\times$	3	=	36	
2(ABC)			3	<u>8</u>	<u>3</u>	
ABC			<u>3</u>	<u>2</u>	<u>1</u>	

$$2(ABC) = 36 \text{ డిగ్రీలు}$$

16

	$\times$	8	$\times$	3	= ఏప్	కెసాగు
AB	12	$\times$	5	=	60	<u>72,120,90</u>
BC	120	$\times$	3	=	360	= 360
CA	90	$\times$	4	=	360	
2(ABC)			12			
ABC			<u>12</u>	<u>2</u>	<u>6</u>	

$$\begin{aligned} \text{A సామాన్యం} &= (\text{ABC}) - \text{BC} = 6 - 3 = 3 \text{ డిగ్రీలు} \\ \text{ABC} &= \frac{\text{మొత్తం}}{\text{A సాగు}} = \frac{360}{3} = 120 \text{ డిగ్రీలు} \end{aligned}$$

17

	$\times$	8	$\times$	3	= ఏప్	కెసాగు
AB	5	$\times$	28	=	140	<u>5,7,4</u>
BC	7	$\times$	20	=	140	= 140
AC	4	$\times$	35	=	140	
2(ABC)			83			
ABC			<u>83</u>	<u>2</u>	<u>41.5</u>	

$$\begin{aligned} \textcircled{17} \quad A\text{సెంగ} &= (ABC) - BC = 41.5 - 20 = 21.5 \\ \textcircled{18} \quad B\text{సెంగ} &= (ABC) - AC = 41.5 - 35 = 6.5 \\ \textcircled{19} \quad C\text{సెంగ} &= (ABC) - AB = 41.5 - 28 = 13.5 \\ \textcircled{20} \quad A\text{ధో} &= \frac{\text{పొ}}{A\text{సెంగ}} = \frac{140}{21.5} \\ \textcircled{21} \quad B\text{ధో} &= \frac{\text{పొ}}{B\text{సెంగ}} = \frac{140}{6.5} \\ \textcircled{22} \quad C\text{ధో} &= \frac{\text{పొ}}{C\text{సెంగ}} = \frac{140}{13.5} \end{aligned}$$

అసామ్యం రాతున ఎందుకు ఇతడు గోప్యం చేస్తాడ.

$$\begin{array}{r} \textcircled{18} \quad \begin{array}{c} 8 \times \text{సె} = 48 \\ A \quad 4 \times 1 = 4 \\ C \quad 9 \quad 4 \times 1 = 4 \\ \hline ABC \quad 2 \quad 2 \quad 8 \end{array} \\ \hline \begin{array}{c} B \quad 8 \times \text{సె} = 48 \\ \text{B} \quad 12 \quad 1 \\ \hline \text{BEC} \quad 3 \quad 4 \end{array} \end{array}$$

$$\begin{array}{r} \textcircled{19} \quad \begin{array}{c} \text{I} \\ A+B = 10 \quad 5 \\ C = 50 \quad 1 \\ \hline ABC \quad 6 \end{array} \\ \hline \begin{array}{c} ABC\% = \frac{50}{6} = \frac{25}{3} \\ \text{II} \end{array} \end{array}$$

$$\begin{array}{r} \begin{array}{c} A \quad \frac{50}{3} \\ B \quad ? \\ \hline AB \quad 10 \end{array} \\ \times 3 \\ \hline B = \frac{150}{2} \times \frac{1}{3} = \frac{50}{2} = 25\% \end{array}$$



$$\begin{array}{r} \textcircled{20} \quad \begin{array}{c} \text{వీర్మ} = \text{పెసింట్రుడ్ = సామ్యం} \\ 8 \times \text{సె} = 48 \\ A \quad 6 \times 2 = 12 \\ B \quad 12 \times 1 = 12 \\ \hline AB \quad 4 \times 3 = 12 \end{array} \end{array}$$

$$\begin{array}{r} \textcircled{21} \quad \begin{array}{c} 7 \times \text{సె} = 42 \\ A \quad 21 \times 2 = 42 \\ B \quad 42 \times 1 = 42 \\ \hline AEB \quad 14 \times 3 = 42 \end{array} \end{array}$$

$$\begin{array}{r} \textcircled{22} \quad \begin{array}{c} A : B \text{ సామ్యం నుండి విషాట్క = } 3 : 1 \\ A : B \text{ శైల్యం నుండి } = 1 : 3 \\ 2 \text{ విషాట్కలతో } \\ 7 \times \text{సె} = 90 \\ A * 30 \times 3 = 90 \\ B * 90 \times 1 = 90 \\ \hline AB \quad 22.5 \quad 4 = 90 \end{array} \end{array}$$

$$\begin{array}{r} \textcircled{23} \quad \begin{array}{c} 2 \longrightarrow 60\% \\ A \quad 1 \longrightarrow ? 30\% \\ B \quad 3 \longrightarrow 90\% \end{array} \end{array}$$

$$\begin{array}{r} \textcircled{24} \quad \begin{array}{c} A : B \text{ సామ్యం } = 1 \frac{3}{4} : 1 \\ = \left( \frac{7}{4} : 1 \right) \times 4 \\ = 7 : 4 \end{array} \end{array}$$

$$\begin{array}{r} \begin{array}{c} 8 \times \text{సె} = 48 \\ A \quad 11 \times 7 = 77 \\ B \quad ? \times 4 = 77 \\ \hline AB \quad 7 \times 11 = 77 \end{array} \end{array}$$

(24) సమానం నిష్పత్తి

$$S : T = \frac{100}{125} : \frac{5}{125} \quad (25\%)$$

$$= 4 : 5$$

$$8^\circ \times \frac{8}{5} = 128$$

$$S \quad 20 \times 4 = 80$$

$$T \quad ? \times 5 = 80$$


---


$$A \& T \quad 9 = 80$$

(25) సమానం

$$A : B = \frac{13\phi}{10\phi} : \frac{10\phi}{10\phi}$$

$$= 13 : 10 \quad 30\% \uparrow$$

$$8^\circ \times \frac{8}{5} = 128$$

$$A \quad 23 \times 13 = 23 \times 13$$

$$B \quad x 10 = 23 \times 13$$


---


$$A \& B \quad 13? \times 23 = 23 \times 13$$

(26) B

ఏగు కోణాలు ||

	A
$\omega$	$\frac{3}{2} \times 8^\circ$
$\omega$	$\frac{3}{2} \times 8^\circ$
$\omega$	$\frac{3}{2} \times 8^\circ$

$$A : B \text{ కోణాల నిష్పత్తి} = \frac{3x}{2} : x$$

$$= 3 : 2$$

$$8^\circ \times 2 = 90$$

$$A \quad ? \times 3 = 90$$


---


$$A \& B \quad 18 \times 5 = 90$$

B 8<sup>o</sup> కోణ = 30 days.

(27)  $A : B \text{ నిష్పత్తి} = \frac{3}{15\phi} : \frac{2}{10\phi}$

$$= 3 : 2$$

$$A \quad 8^\circ \times \frac{8}{3} = 128$$

$$B \quad \frac{3}{2} \times 5 = 15$$

$$C \quad 40 \times 2.5 = 100$$

$$A \& C \quad ?x \times 7.5 = 100$$

$$x = \frac{100}{7.5} = \frac{100}{\frac{15}{2}} = \frac{40}{3} = 13 \frac{1}{3}$$

(28)

	$8^\circ$	$\frac{8}{5}$	$8^\circ \times \frac{8}{5}$
A	x	A	$2x$
B	y	B	$\frac{y}{3}$
		AB	$5 \times (x+y)$
		A&B	$3 \times (2x + \frac{y}{3})$

$$\text{మొత్తంవు} = 5x+5y \quad \text{మొత్తంవు} = 6x+y$$



$$5x+5y = 6x+y$$

$$x = 4y$$

$$\frac{x}{y} = \frac{4}{1}$$

$$x : y = 4 : 1$$

$$A \quad 8^\circ \times \frac{8}{5} = 128$$

$$A \quad ? \times 4 = 25$$

$$B \quad x 1 = 25$$


---


$$AB \quad 5 \times 5 = 25$$

$$A \text{ కోణ } = \frac{25}{4} = 6 \frac{1}{4} 8^\circ$$

(29)

	$8^\circ \times \frac{8}{5}$	$8^\circ$
A	$15 \times 4$	= 60
B	$20 \times 3$	= 60
		$A \& B \quad 7 = 60$

కెసా

8, 10, 12

= 120

$$\textcircled{1} \quad AQB \text{ రేఖలపై } = 4 \times 1 = 28 \text{ చతురంగిలు}$$

$$\text{విగిలనప్పి } = 60 - 28 = 32$$

$$\text{విగిలన } = \frac{32}{60} = \frac{8}{15}$$

$$\textcircled{30} \quad \text{కో} \parallel x \text{ నొ } = \text{ఎన్} \quad \text{కెసాగు}$$

$$A \quad 18 \times 5 = 90$$

$$B \quad 15 \times 6 = 90$$

$$\underline{AB} \quad 11 = 90$$

$$B \quad 10 \text{ రేఖలపై } = 10 \times 6 = 60 \text{ చతురంగిలు}$$

$$\text{విగిలనప్పి } = 90 - 60 = 30$$

$$A \text{ రేఖలు } = \frac{30}{A \text{ సామ్యార్థి }} = \frac{30}{5} = 6 \text{ రేఖలు}$$

$$\textcircled{31} \quad \text{కో } x \text{ నొ } = \text{ఎన్}$$

$$A \quad 15 \times 2 = 30$$

$$B \quad 10 \times 3 = 30$$

$$\underline{AQB} \quad 5 = 30$$

$$AQB \text{ రేఖలపై } = 2 \times 5 = 10 \text{ చతురంగిలు}$$

$$\text{విగిలనప్పి } = 30 - 10 = 20 \text{ చతురంగిలు}$$

$$A \text{ రేఖలు } = \frac{20}{A \text{ సామ్యార్థి }} = \frac{20}{2} = 10 \text{ రేఖలు}$$

$$\text{మొత్తం కొలం } = 2 + 10 = 12 \text{ రేఖలు}$$

$$\textcircled{32} \quad \text{కో } x \text{ నొ } = \text{ఎన్}$$

$$A \quad 24 \times 3 = 72$$

$$B \quad 9 \times 8 = 72$$

$$C \quad 12 \times 6 = 72$$

$$\underline{ABC} \quad 17 = 72$$

$$BPC \text{ రేఖలపై } = 3 \times 14 = 42 \text{ రేఖలు}$$

$$\text{విగిలనప్పి } = 72 - 42 = 30 \text{ చతురంగిలు}$$

$$A \text{ రేఖలు } = \frac{30}{A \text{ సామ్యార్థి }} = \frac{30}{3} = 10 \text{ రేఖలు}$$

(33)

$$8 \times 8 = \text{ఎన్}$$

$$P \quad 8 \quad 15$$

$$Q \quad 10 \quad 12 \leftarrow 22$$

$$R \quad 12 \quad 10 \leftarrow$$

$$\underline{PQR} \quad 37$$

కెసా

$$9\text{AM} - 11\text{AM}, 2 \text{ గంచిల్లి } PQR \text{ లప్పి } = 2 \times 37 = 74$$

$$\text{విగిలనప్పి } = 120 - 74 = 46 \text{ చతురంగిలు}$$

$$QDR \text{ గంచిల్లి } = \frac{46}{QDR \text{ సామ్యార్థి }} = \frac{46}{22} = 2 \text{ గంచిల్లి}$$

$$= 11\text{AM} + 2\text{hrs}$$

$$= 1 \text{ PM}$$

(34)

$$8 \times 8 = \text{ఎన్}$$

$$AB \quad 30 \times 4 = 120$$

$$BC \quad 24 \times 5 = 120$$

$$CA \quad 20 \times 6 = 120$$

$$\underline{2(ABC)} \quad 15 = 120$$

$$ABC = \frac{15}{2} = 7.5$$

$$BC \text{ రేఖలపై } = 10 \times 7.5 = 75$$

$$\text{విగిలనప్పి } = 120 - 75 = 45$$

$$A \text{ రేఖలు } = \frac{45}{A \text{ సామ్యార్థి }} = \frac{45}{\frac{5}{2}} = 18 \text{ రేఖలు}$$

(35)

$$8 \parallel x \text{ నొ } = \text{ఎన్}$$

$$X \quad 20 \times 3 = 60$$

$$Y \quad 12 \times 5 = 60$$

$$\underline{XY} \quad 8 = 60$$

$$X \text{ రేఖలపై } = 4 \times 3 = 12$$

$$\text{విగిలనప్పి } = 60 - 12 = 48$$

$$X \text{ రేఖలపై } = \frac{48}{8} = 6 \text{ రేఖలు}$$

$$\text{మొత్తం } = 4 + 6 = 10$$

కెసా

8, 10, 12

= 120

కెసాగు

= 30, 24, 120

= 120

$$A = ABC - BC \\ = 7.5 - 5 \\ = 2.5 / 5/2$$

36) 1 వర్షంలో  $A\oplus B = 30$  డాయిట్  
 $A\oplus B = \frac{1}{30}$  వర్షంలు  
 $A\oplus B$  20 డాయిట్లలోని =  $20 \times \frac{1}{30} = \frac{2}{3}$   
 మిగిలనవని =  $\frac{1}{3}$  వర్షం  
 A  $\rightarrow \frac{1}{3} w = 20$  డాయిట్  
 మొత్తంవని A  $\Rightarrow w = 60$  డాయిట్

37)  $\left( \begin{array}{l} \text{సిక్స్ కోసిలువని} = \frac{1}{40} \text{ డాయిట్} \\ \text{ఎప్పిల్ వని} = \frac{1}{40} \times \frac{1}{5} = \frac{1}{200} \end{array} \right)$  | మిగిలనవని =  $\frac{4}{5}$   
 Y  $\rightarrow \frac{4}{5} w = \frac{16}{20}$   
 $w = 20$

$\frac{8}{x} \times \frac{1}{20}$	$x = 40$
$y = 20 \times 2$	$= 40$
$xy$	$3 = 40$
$xy = \frac{40}{x}$	$= 13\frac{1}{3}$ డాయిట్

38)  $HBC$  1 వర్షంకి =  $10$  డాయిట్  
 $BCC$  1 వర్షంకి =  $\frac{1}{10}$  వర్షం  
 $BCC$  4 డాయిట్లలోని =  $\frac{4}{10} \times \frac{1}{5} = \frac{2}{25}$   
 A  $\begin{array}{|c|c|} \hline & 80 \\ \hline ? & \\ \hline B+C & 50/x \\ \hline ABC & 10 \\ \hline \end{array}$  నొ = లు  
 $80 \times \frac{1}{x} = \text{వని}$

$A\oplus B$	$50 \times 3 = 150$
$ABC$	$30 \times 5 = 150$
$A$	$\frac{150}{2} \times \frac{1}{2} = \frac{75}{2} = 25$ డాయిట్

39) A  $\downarrow$   
 $\frac{4}{5} w = 20$   
 $w = 25$

కసాగు  $\begin{array}{r} 80 \times 3 = \text{వని} \\ A 25 \times 3 = 75 \\ B \frac{?}{37.5} \quad 2 = 75 \\ \hline A\oplus B \quad 15 \times 5 = 75 \end{array}$

40)  $8 \times x$   
 A  $x$   
 B  $y$

A $\oplus B$  30 డాయిట్ (x+4)

కసాగు  $\begin{array}{l} \text{మొత్తంవని} = 30x + 30y \\ \text{A} \quad 16x + 44y \\ \text{B} \quad 16x + 44y \end{array}$



$30x + 30y = 16x + 44y$   
 $14x = 14y$   
 $x:y = 1:1$

కసాగు  $\begin{array}{r} 8 \times 1 = \text{వని} \\ A \quad 60 \quad 1 = 60 \\ B \quad 60 \quad 1 = 60 \\ \hline A\oplus B \quad 30 \times 2 = 60 \end{array}$

41)  $A\oplus B$  1 వర్షంలో =  $\frac{1}{12}$

$B\oplus C$  11 =  $\frac{1}{16}$   
 $= 5A + 7B + 13C -$   
 $= 5A + 5B + 2B + 2C + 11C$   
 $= 5(A\oplus B) + 2(B\oplus C) + 11C$

$5\left(\frac{1}{12}\right) + 2\left(\frac{1}{16}\right) + 11\left(\frac{1}{x}\right) = 1$

C మొత్తం =  $\frac{4}{x}$  డాయిట్

C డాయిట్లలోని =  $\frac{1}{x}$  వర్షం.

$$\frac{5}{12} + \frac{1}{8} + \frac{11}{x} = 1$$

$$\frac{10+3}{24} + \frac{11}{x} = 1$$

$$\frac{11}{x} = \frac{11}{24}$$

$$x = 24$$

**OR**

$$8 \times \text{సౌ}$$

$$A+B \quad 12 \quad 4$$

$$B+C \quad 16 \quad 3$$

$$C \quad x$$

$$5 \times 4 + 2(3) = 26$$

$$\text{శుద్ధిలు} = 48 - 26 = 22$$

$$\text{చోటు} = \frac{22}{\text{సౌ}}$$

$$11 = \frac{2x}{x} \Rightarrow x = 2$$

$$\text{చోటు} = \frac{48}{x} = 24 \text{ రూ}$$

$$42 \quad 8 \times \text{సౌ} = \text{పని}$$

$$A \quad 45 \times 8 = 360$$

$$B \quad 40 \times 9 = 360$$

$$AQB \times 17 = 360$$

$$\text{శుద్ధి} = B \quad 23 \text{ రూ} \parallel \text{పని}$$

$$= 23 \times 9$$

$$= 207$$

$$\text{మందుషు} = 360 - 207 = 153$$

$$AQB = \frac{153}{17} = 9$$

AQB దార్శనాకులు 9 రూఱుల చేరు  
(వేద)

A 9 రూఱుల తరవాత వెళ్ళచేయాడు.

43

$$8 \parallel \times \text{సౌ} = \text{పని}$$

$$A \quad 14 \times 3 =$$

$$B \quad 21 \times 2 =$$

$$\underline{- AQB \qquad \qquad \qquad 5}$$

కొసాగు

14, 21

$$= 42$$

$$\text{శుద్ధి} = B \quad 3 \text{ రూలపని} = 3 \times 2 = 6 \text{ రూలపని}$$

$$\text{మందుషు} = 42 - 6 = 36 \text{ రూలపని}$$

$$AQB = \frac{36}{5} = 7 \frac{1}{5} \text{ రూలపని}$$

$$\text{పెట్టుతుంపని} = 7 \frac{1}{5} + 3 \text{ రూ} \parallel \Rightarrow 10 \frac{1}{5} \text{ రూ} \parallel$$

టు 0 =

44

$$8 \parallel \times \text{సౌ} = \text{పని}$$

$$A \quad 24 \times 6$$

$$B \quad 36 \times 4$$

$$C \quad 48 \times 3$$

$$\underline{- AQB \qquad \qquad \qquad 13}$$

కొసాగు

24, 36, 48

$$= 144$$

$$\text{పనికి} = x \text{ రూ} \parallel \text{ప్రపాఠము}$$

A

$$\text{రూలపని} (x-3)$$

B

$$x$$

C

$$4$$

కెట్టుబ్బంగ్ 6

$$4$$

3

$$6(x-3) + 4x + 12 = 144$$

$$10x = 150$$

$$x = 15 \text{ రూలపని}.$$

45

\*\*

## WAGES (జీతం)

41 300 రూ, A-10, B-15 రూ. కొసాగు చేస్తే గిరులాశితం

సామాన్యం ఉర్కాని మనం ఇతం ఇత్తునవ్వి.

$$A \times 10 \qquad 3$$

$$B \times 15 \qquad 2$$

$$\underline{- A \qquad \qquad \qquad 5}$$

$$A \text{ జీతం} = \frac{3}{5} \times 300 = 180 \text{ రూ} \parallel$$

$$B \text{ జీతం} = \frac{2}{5} \times 300 = 120 \text{ రూ} \parallel$$

32)  $300 \text{Rs}$  (వ్యవతరకర లింగం)

$A \& B$	$C$ లింగం
$\frac{2}{3}$ వంతు	$\frac{1}{3}$ వంతు
$\frac{2}{3} \times 300$	$= \frac{1}{3} \times 300$
$= 200 (A+B)$	$C = 100 \text{Rs}$

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33)  $A + B + C = 300$

$A + C = 188$

$B + C = 152$

---

$A + B + C = 340$

$A + B + C$  బదలకా 300 లక్ష్మిపుర్ణామి

$300 + \text{?} = 340$

$C = 40$

34)  $A \& B \& C = 529 \text{Rs.}$

$A \& B = \frac{19}{23}$

$C = \frac{4}{23}$

$B \& C = \frac{8}{23} \rightarrow$  వ్యవతరణ

$A = \frac{15}{23} \rightarrow$  లింగంవని

$A = \frac{15}{23} \times \frac{23}{529}$

$A = 345$



35)  $8^{\circ} \times \text{సౌ} = \text{ఎన్}$

Kim 3 2

D 2 3

---

K4D 5

$K \text{వాట} = \frac{2}{5} \times \frac{30}{150} = 60 \text{Rs}$

36)  $A \quad | \quad B$

$\frac{1}{4} \omega = 38^{\circ}$	$\frac{1}{6} \omega = 48^{\circ}$
$\omega = 128^{\circ}$	$\omega = 248^{\circ}$

37)  $8^{\circ} \times \text{సౌ} = \text{ఎన్}$

$A 12$	$2 = 24$
$B 24$	$1 = 24$
<hr/>	
$A \& B$	$3 = 24$
<hr/>	
$A \text{ వాట} = \frac{2}{3} \times 180 = 120 \text{Rs.}$	

కసాగు  
 $12,24$   
 $= 24$

38)  $8^{\circ} \times \text{సౌ} = \text{ఎన్}$

$A 6$	$4 = 24$
$B 8$	$3 = 24$
$C ?$	$1 = 24$
<hr/>	
$A \& B \& C$	$3 \times 8 = 24$

కసాగు  
 $16,8,3$   
 $= 24$

$C \text{ వాట} = \frac{1}{8} \times 3200 \Rightarrow 400 \text{Rs.}$

39)  $8^{\circ} \times \text{సౌ} = \text{ఎన్}$

$A 21$	$4 = 84$
$B 28$	$3 = 84$
<hr/>	
$A \& B$	$(12) \times 7 = 84$

$21,28$   
 $= 84$

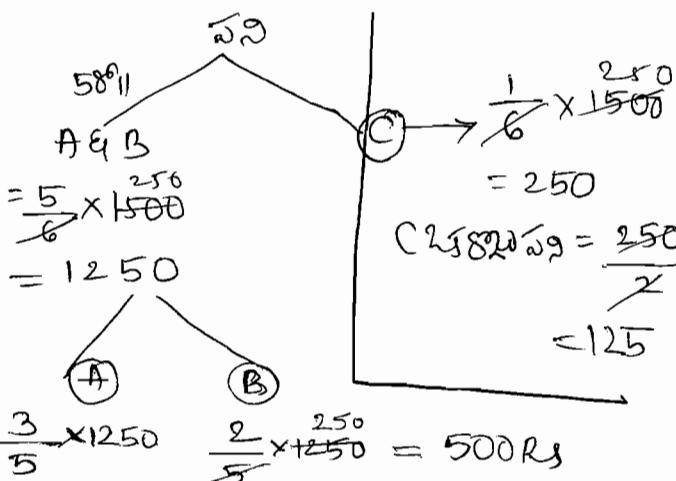
40)  $8^{\circ} \times \text{సౌ} = \text{ఎన్}$

$A 10$	$3 = 30$
$B 15$	$2 = 30$
<hr/>	
$A \& B$	$(6) \times 5 = 30$

$10,15$   
 $= 30$

$A \& B$  మొత్తమి  $= \frac{1}{6}$

$A \& B$  5రూపమి  $= 5 \times \frac{1}{6} = \frac{5}{6}$



$$B \text{ నుండి పుత్రాలు} = \frac{500}{5} = 100 \text{ డారమ}$$

$$B+C = 100+125 = 225 \text{ డారమ}$$

(52)

$$\begin{array}{l} 8^{\text{th}} \times \text{ను} = \\ A \quad 20 \times 3 = 60 \\ B \quad 30 \times 2 = 60 \\ \hline A+B \quad 12 \times 5 = 60 \end{array}$$

$8^{\text{th}} \times \text{ను} =$	$A \quad 3$	$B \quad 1$	$\text{గొ}$
	$A \quad 3$	$B \quad 1$	$\text{గొ}$

$$= \frac{60}{4} \Rightarrow 15 \text{ డారమ}$$

\*\*

## Alternate Days

శ్రీఖరిహితప్రస్తుతి

$$\begin{array}{l} 8^{\text{th}} \times \text{ను} = \text{వీ} \\ A \quad 6 \times 3 = 18 \end{array}$$

కొసగు  
6, 18

$$B \quad 18 \times 1 = 18$$

$$\hline A+B \quad 4 = 18$$

A క్రమాంकాలు

3	1
A	B

అతీ 4 డారమంలక్క  
2 రోజులు వచుతంది.  
18 ల వ్యాపారాలన్నాయి

$$= \frac{18}{4} = 4 \text{ pairs} + 2 \text{ extra}$$

$$= 8 \text{ days} + \frac{2}{3} \text{ day}$$

$$= 8 \frac{2}{3}$$

1	3
B	A

అతీ 4 డారమంలక్క 2 రోజులు

వచుతంది. 18 ల

వ్యాపారాలన్నాయి

$$= \frac{18}{4} = 4 \text{ pairs} + 2 \text{ extra}$$

$$= 8 \text{ days} + 1 \text{ day} + 1 \text{ extra}$$

$$= 9 \text{ days} + \frac{1}{3} \text{ day}$$

$$= 9 \frac{1}{3} \text{ రోజులు}$$



53

8^{\text{th}} \times \text{ను} = \text{వీ}

$$A - 16 \times 3 = 48$$

$$B - 12 \times 4 = 48$$

$$\hline A+B \quad \times 7 = 48$$

A వీ క్రమాంకాలు

3	4
A	B

కొసగు  
16, 12

$$= 48$$

అతీ 7 డారమంలక్క 2 రోజులు వచుతంది.

48 ల వీ 7 ల క్రమాంకాలు.

$$= \frac{48}{7} = 6 \text{ pairs} + 6 \text{ extra}$$

$$= 12 \text{ days} + 1 \text{ day} + 3 \text{ extra}$$

$$= 13 \text{ days} + \frac{3}{4}$$

$$= 13 \frac{3}{4} \text{ రోజులు}$$

54

8^{\text{th}} \times \text{ను} = \text{వీ}

$$A - 11 \times 20 = 220$$

$$B - 20 \times 11 = 220$$

$$C - 55 \times 4 = 220$$

$$\hline A+B+C \quad \times 35 = 220$$

కొసగు

11, 20, 55

$$= 220$$

కొసగు

10, 20, 30

$$= 60$$

Q2

$$8^{\text{th}} \times \text{ను} = \text{వీ}$$

$$A - 10 \times 6 = 60$$

$$B - 20 \times 3 = 60$$

$$C - 30 \times 2 = 60$$

$$\hline A+B+C \quad \times 11 = 60$$

ఎన్ని తీవ్రమైన తరువాత A, B యి శీఖివిషిటీ గుణము వ్యాపారాలన్నాయి ?

2,	6,	3
1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
C	A	B

ప్రతీ 4 డారమంలక్క  
3 రోజులు వచుతంది.

$$= 60 \text{ ల వీ } 11 \text{ ల క్రమాంకాలు } = \frac{60}{11} = 5 \frac{5}{11}$$

$$= 5 \text{ pairs} + 5 \text{ extra}$$

$$= 15 \text{ days} + 1 \text{ day} + 3 \text{ extra}$$

$$= 16 \text{ days} + \frac{3}{8} \text{ days}$$

$$= 16 \frac{1}{2} \text{ days.}$$

\*\*

కొసగు

16, 12

$$\begin{array}{r} 31 \\ \times 1 \\ \hline 31 \end{array}$$

$$\begin{array}{r} 24 \\ \times 2 \\ \hline 48 \end{array}$$

55

57

$$8^{\text{th}} \times \text{నొ}$$

$$A \quad 36 \times 6$$

$$B \quad 54 \times 4$$

$$C \quad 72 \times 3$$

$$\begin{array}{r} \text{కొను} \\ 36, 54, 72 \\ = 216 \end{array}$$

తుట్టి 55 బెల్లుంగలకి 2 శోషణ వచ్చుతుంది.

220 లకి ఎగ్గు 55 ల వున్నాయి.

$$= \frac{220}{55} \Rightarrow 4 \text{ pairs} \Rightarrow 8 \text{ days.}$$

5)  $8^{\text{th}} \times \text{నొ} = \text{వీణి}$

A)  $20 \times 3 = 60$

B)  $30 \times 2 = 60$

C)  $60 \times 1 = 60$

ABC  $\times 6 = 60$

$$\begin{array}{r} \text{కొను} \\ 20, 30, 60 \\ = 60 \end{array}$$

తుట్టి 12 బెల్లుంగలకి 3 శోషణ వచ్చుతుంది.



60 లకి ఎగ్గు 12 ల వున్నాయి.

$$= \frac{60}{12} \Rightarrow 5 \text{ pair} \Rightarrow 15 \text{ days.}$$

6)  $8^{\text{th}} \times \text{నొ} = \text{వీణి}$

A)  $20 \times 3$

B)  $15 \times 4$

AB  $\neq$

$$\begin{array}{r} 20, 15 \\ = 60 \end{array}$$

P (Persons) D (days) H (hours)

$$P \propto \frac{1}{D}$$

$$PD = K$$

$$P \propto \frac{1}{H}$$

$$P \propto \frac{1}{DH}$$

$$PDH = K$$

$$\begin{cases} ① P_1 D_1 = P_2 D_2 \\ ② P_1 D_1 H_1 = P_2 D_2 H_2 \end{cases} \quad \left\{ \begin{array}{l} \text{వీణి స్థిరం చేసుకుట} \\ \text{ప్రాథమిక వీణి} \end{array} \right.$$

$$\begin{cases} ③ \frac{P_1 D_1}{W_1} = \frac{P_2 D_2}{W_2} \\ ④ \frac{P_1 D_1 H_1}{W_1} = \frac{P_2 D_2 H_2}{W_2} \end{cases} \quad \left\{ \begin{array}{l} \text{వీణి స్థిరం} \\ \text{లేనుకుట.} \end{array} \right.$$

Q1) 5 కురుకులు 2 రోజుల్లో చేయగలిగితే  
అది రోజుల్లో 10 మంది వీణి కొట్టు చేయగలరు.

$$P_1 D_1 = P_2 D_2$$

$$\frac{5}{2} \times 10 = 25 \times D_2$$

$$D_2 = 2$$

Q2) 2 రోజుల్లో 12 మంది 10 మందుల్లో చేయగలిగితే  
అది నవయంగా తెండుతుంది ఏమి చేయగలదే?

ఎంత వర్షిత మంది కొనాలి?

$$\begin{array}{r} \text{శోషణ} = \frac{\text{మొత్తం}}{\text{C కావుళ్యం}} = \frac{60}{\frac{20}{2} \times 2} = 40 \text{ శోషణ} \end{array}$$

$$\frac{P_1 d_1}{w_1} = \frac{P_2 d_2}{w_2}$$

$$\frac{12 \times 10}{1} = \frac{(12+x) \times 10}{2}$$

$$24 = 12+x$$

$$x = 12$$

## TOTAL WORK | మొత్తం పని

మొత్తం పని

$$\textcircled{1} \quad 10 \text{ men } 20 \text{ days} = 200 \text{ man-days}$$

$$\textcircled{2} \quad 16 \text{ women } 5 \text{ days} = 80 \text{ woman-days}$$

$$\textcircled{3} \quad 15 \text{ boys } 3 \text{ days} = 45 \text{ boy-days}$$

$$200 \text{ md} = 80 \text{ wd} = 45 \text{ bd}$$

$$40m = 16wd = 9bd$$

\* \*

$$\textcircled{58} \quad \text{మొత్తం పని} = \text{మొత్తం పని}$$

$$16m \times 15d = 20w \times 16d$$

$$\frac{m}{w} = \frac{4}{3}$$

$$m:w = 4:3$$

\textcircled{59}

$$10m \quad 15d = 150 \text{ md} \quad | \quad 10m + 15w \rightarrow ?$$

$$15w \quad 12d = 180 \text{ wd} \quad | \quad 2(5m) + 15w \rightarrow ?$$

$$150 \text{ md} = 180 \text{ wd}$$

$$5m = 6w$$

$$27w \rightarrow ?$$

$$15w \rightarrow 12d$$

$$27w \rightarrow ?$$

$$P_1 d_1 = P_2 d_2$$

$$\frac{15 \times 12}{5 \times 4} = \frac{21 \times d_2}{3} \Rightarrow d_2 = \frac{20}{2} = 6 \frac{2}{3}$$

\textcircled{60}

$$\text{మొత్తం పని} = 7m \times 12d = 84 \text{ md}$$

$$\text{భరిసిన పని} = 7m \times 5d = 35 \text{ md}$$

$$\text{మిగిలిన పని}$$

$$49 \text{ md}$$

$$82 \text{ md} = \frac{49 \text{ md}}{\frac{5}{7}}$$

$$= 9 \frac{4}{5} \text{ days}$$



$$\frac{P_1 d_1 h_1}{w_1} = \frac{P_2 d_2 h_2}{w_2}$$

$$\frac{12 \times 10 \times 8}{1} = \frac{(12+x) \times 10 \times 8}{2}$$

$$24 = 12+x$$

$$x = 12$$

$$\textcircled{3} \quad \text{ఒక పనిని } 10 \text{ మంది } 12 \text{ దినాల్లో 8 గంచట రీక్రూట్ }$$

$$\text{ఎన్నచేస్తి, అదుపని } 5 \text{ మంది } 16 \text{ దినాల్లో 8 కూడా }$$

$$\text{ఎన్నగంచట పనిచేయగలా?}$$

$$\frac{P_1 d_1 h_1}{w_1} = \frac{P_2 d_2 h_2}{w_2}$$

$$\frac{10 \times 12 \times 8}{1} = \frac{16 \times 8 \times h_2}{2}$$

$$h_2 = 12$$

$$\textcircled{4} \quad \text{ఒక పనిని } 12 \text{ మంది } 16 \text{ దినాల్లో 8 గంచట రీక్రూట్ }$$

$$\text{ఎన్నచేస్తు - లంతకంటే మాజీంతవ పనిని కూడా }$$

$$6 \text{ గంచట } 24 \text{ మంది ఎన్నకూలాల్లో పనిచేయగలా?$$

$$\frac{P_1 d_1 h_1}{w_1} = \frac{P_2 d_2 h_2}{w_2}$$

$$\frac{12 \times 16 \times 8}{1} = \frac{24 \times d_2 \times 8}{8}$$

$$d_2 = 16 \times 2 \Rightarrow 32 \text{ దినాల్లో}$$

$$\textcircled{5} \quad 24 \text{ మంది } 16 \text{ దినాల్లో 8 గంచట పని}$$

$$\text{చేస్తు } 2 \text{ రెగ్డ్ పోటీ } \times 2 = 300 \times 100 \times 200$$

$$\text{కెక్కి, బంత మంది } 16 \text{ దినాల్లో 12 గంచట రీక్రూట్ }$$

$$\text{ఎన్నచేస్తు మళ్ళీ రెగ్డ్ పోటీ } \times 2 = 200 \times 50 \times 150$$

గొడవ రచ్చాడు?

$$\frac{P_1 d_1 h_1}{w_1} = \frac{P_2 d_2 h_2}{w_2}$$

$$\frac{24 \times 16 \times 8}{300 \times 100 \times 200} = \frac{P_2 \times 16 \times 12}{200 \times 50 \times 150}$$

$$P_2 = 4$$

1) వెత్తంపని =  $12m \times 9d = 108md$   
 చుట్టినపని =  $12m \times 6d = 72md$   
 $\underline{(-)}$   
 నిగిలనపని =  $= 36 \text{ days}$

$8\text{ రోజు } = \frac{3d \times d}{18} = 2 \text{ days}$

2)  $\omega = 2m$        $b = \frac{m}{2}$   
 $m = \frac{\omega}{2}$        $b = \frac{\omega/2}{2}$   
 $b = \frac{\omega}{4}$

$3m + 4\omega + 6b \rightarrow 78^{\circ} \text{ II}$   
 $3\left(\frac{\omega}{2}\right) + 4\omega + 6\left(\frac{\omega}{4}\right) \rightarrow 78^{\circ} \text{ II}$   
 $3\omega + 4\omega \rightarrow 78^{\circ} \text{ మొదటి}$   
 $(7\omega) \rightarrow 78^{\circ} \text{ మొదటి}$

3)  $8^{\circ} \times 8 = \text{పని}$   
 $1m \quad 3 \times 4$   
 $1\omega \quad 4 \times 3$   
 $1b \quad 12 \times 1$   
 $\underline{+ 1\omega + 1b} \quad 8$   
 $= 1 \text{ పురుషాడు} + 1 \text{ స్త్రీ} + x \text{ బాయిరు}$   
 $= 4 + 3 + x \times 1$   
 $= 7 + x$   
 $8\text{ రోజు } = \frac{\text{వెత్తం}}{\text{సామాన్యం}}$   
 $\frac{1}{4} \times \frac{12}{7+x}$   
 $4.8 = 7+x$   
 $x = 41$

64)  $8^{\circ} \times 8$   
 $1m \quad 100 \times x$   
 $\underline{1\omega \quad x \quad 100}$   
 $\underline{1m+1\omega \quad 100+x}$   
 $= 10 \text{ పురుషాడు} + 15 \text{ స్త్రీలు$   
 $= 10(x) + 15(100)$   
 $= 10x + 1500$

6 =  $\frac{10x}{10x + 1500}$   
 $6x + 900 = 10x$   
 $4x = 900$   
 $x = 225$

65)  $12m \quad 4d = 48md$   
 $15\omega \quad 4d = 60\omega d$   
 $48md = \frac{5}{6} 60\omega d$   
 $4m = 5\omega$   
 $\text{వెత్తంపని} = 12m \times 4d = 48md$   
 $\text{చుట్టినపని} = 6m \times 2d = 12md$   
 $\underline{(-)}$   
 $\text{నిగిలనపని} = 36md$   
 $= 9 \times 4m d$   
 $= 9 \times 5\omega d$   
 $= 45\omega d$   
 $8\text{ రోజు } = \frac{15}{20} 45\omega d$   
 $x = 15 \text{ రోజు }$

66)  $1/2 b \times 16d = 8m \times 2d$   
 $\boxed{2b = 1m}$   
 $\text{వెత్తంపని} = 8m \times 12d = 96md$   
 $\text{చుట్టినపని} = 16m \times 3d = 48md$   
 $\underline{(-)}$   
 $\text{నిగిలనపని} = 48md$   
 $\text{నిగిలనపుచ్చేయడి} = 6m + 4b$   
 $= 6m + 2m$   
 $= 8m$   
 $8\text{ రోజు } = \frac{48md}{8m} = 6 \text{ days}$

$$67) 10\omega \times 7d = 10b \times \frac{2}{14}d$$

$$10\omega = 2b$$

$$\text{ప్రక్రియ} = \frac{\omega}{\text{మండ}}$$

$$2d = \frac{96 \text{ md}}{(24+n)m}$$

$$\text{ప్రాతిష్ఠానికి} = 10\omega \times 7d = 70\omega d$$

$$\text{ప్రాతిష్ఠానికి} = 5\omega + 10b$$

$$= 5\omega + 5\omega$$

$$= 10\omega$$

$$\text{ప్రక్రియ} = \frac{10\omega d}{10\omega} = 7 \text{ days.}$$

$$68) 16m \times \frac{2}{12}d = 24b \times \frac{3}{18}d$$

$$4m = 9b$$

$$= 3(\frac{4}{3}m) + 8b$$

$$= 3(\frac{4}{3}b) + 8b$$

$$= 35b$$

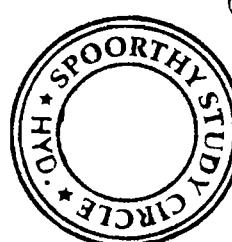
$$\text{ప్రాతిష్ఠానికి} = 24b \times 18d = 432bd$$

$$\text{జీవికాలికి} = 35b \times 8d = 280bd$$

$$\text{స్విట్చింగ్ వర్ష} = 152bd$$

$$\text{ప్రాతిష్ఠానికి} \rightarrow 35b + 3b = 38b$$

$$\text{ప్రక్రియ} = \frac{152bd}{38b} = 4 \text{ days.}$$



$$70) 5m + 2b = 4(1m + 1b)$$

$$5m + 2b = 4m + 4b$$

$$m = 2b$$

$$\frac{m}{b} = \frac{2}{1} \Rightarrow m:b = 2:1$$

$$71) 12m + 16b \quad 5 \text{ ప్రక్రియ}$$

$$13m + 24b \quad 4 \text{ ప్రక్రియ}$$

$$\text{ప్రాతిష్ఠానికి} = \text{ప్రాతిష్ఠానికి}$$

$$5(12m + 16b) = 4(13m + 24b)$$

$$60m + 80b = 52m + 96b$$

$$8m = \frac{2}{16}b$$

$$1m = 2b \Rightarrow m = 2b \Rightarrow \frac{m}{b} = \frac{2}{1}$$

72)

$$4m + 6\omega \rightarrow 8d$$

$$3m + 7\omega \rightarrow 10d$$

$$10\omega \rightarrow ?$$

$$4(11\omega) + 6\omega \rightarrow 8d$$

$$50\omega \rightarrow 8d$$

$P_1$	$d_1$	$P_2$	$d_2$
$50\omega$	$8d$	$10\omega$	?

$$\text{ప్రాతిష్ఠానికి} = 24m \times 16d = 384md$$

$$24m \times 16d = 32\omega \times 24d$$

$$1m = 2\omega$$

$$\text{ప్రాతిష్ఠానికి} = 24m \times 16d = 384md$$

$$\text{జీవికాలికి} = 24m \times 12d = 288md$$

$$\text{స్విట్చింగ్ వర్ష} = 96md$$

$$\text{ప్రాతిష్ఠానికి} = 16m + 16\omega$$

$$= 16m + 8m$$

$$= 24m$$

$$\text{ప్రాతిష్ఠానికి} = \text{ప్రాతిష్ఠానికి}$$

$$\frac{4}{5}(4m + 6\omega) = \frac{5}{6}(3m + 7\omega)$$

$$16m + 24\omega = 15m + 35\omega$$

$$1m = 11\omega$$

$$P_1 d_1 = P_2 d_2$$

$$\frac{5}{6} \times 8 = 10 \times d_2$$

$$d_2 = 40 \text{ ప్రక్రియ}$$

3)  $m + 3w + 4b = 96 \times 5$  కలాగు  
 $2m + 8b = 80 \times 6$   
 $2m + 3w = 120 \times 4$

---

15

Q)  $2m + 3w = 4 \text{ days}$   
 $3m + 2w = 5 \text{ days}$   
 $4m + 4w \rightarrow ?$

Ans:  $4(2m + 3w) = 5(3m + 2w)$   
 $8m + 12w = 15m + 10w$   
 $7m = 2w$

OR

$3 \times (2m + 3w)$	4	5
$\times 2 (3m + 2w)$	5	4
<hr/>		
9		

$2m + 3w = 4$   
 $m + 3\left(\frac{2}{3}w\right) = 4$   
 $2m = 2$   
 $m = 1$

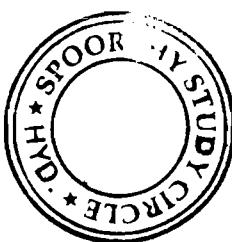
$2m + 8b = 6$   
 $2(1) + 8b = 6$   
 $8b = 4$   
 $b = \frac{1}{2}$

$6m + 9w = 15$   
 $6m + 4w = 8$   
 $5w = 7$   
 $w = \frac{7}{5}$

$2m + 3w = 5$   
 $2m + 3\left(\frac{7}{5}\right) = 5$

$5m + 12b \rightarrow ?$   
 $5(1) + 12\left(\frac{1}{2}\right)$   
 $5 + 6$   
 $= 11$

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



4)  
 $6m + 8b \rightarrow 10d$   
 $26m + 48b \rightarrow 20d$   
 $15m + 20b \rightarrow ?$

$10(6m + 8b) = 2(26m + 48b)$   
 $5(3m + 4b) = 13m + 24b$   
 $15m + 20b = 13m + 24b$

$2m = 4b$   
 $m = 2b$

$15(2b) + 20b \rightarrow ?$   
 $50b \rightarrow ?$

$P_1 d_1 = P_2 d_2$

$20 \times 10 = 50 \times d_2$

$d_2 = 4$

# PIPE'S & CISTERN'S

## పైప్స్ - తొట్టెలు

### Basic Questions

Q1) A - 10 నించుతుంది, B + 2 గంగలు నింపుతుంది. అయితే ట్యూంక్ ఎంతనీ వట్ట సండుతుంది?

$$\begin{array}{r} \text{A} \\ \text{B} \\ \hline \text{A} \oplus \text{B} \end{array} \begin{array}{l} 10 \times 6 \\ 12 \times 5 \\ \hline 11 \end{array}$$

$$\text{ABC రాశి} = \frac{\text{వెత్తం}}{\text{ABC సామాధ్యం}} = \frac{60}{11} = 5\frac{5}{11}$$

Q2) ఒక ట్యూంక్ లో A - 24 గంగలు నించుతుంది, B అనే క్రింద ఉన్న 8 గంగలు ఖాళీచేస్తుంది. అయితే ట్యూంక్ సిండుతుండు? ఏంతనమయి?

$$\begin{array}{r} \text{A} \\ \text{B} \\ \hline \text{A} \oplus \text{B} \end{array} \begin{array}{l} 24 \times 1 \\ 8 \times -3 \\ \hline -2 \end{array}$$

$$\text{ABC} = \frac{24}{2} = 12 \text{ గంగలు ఖాళీ అపుతుంది.}$$

Q3) ఒక ట్యూంక్ లో ఒక గంగి ప్రవుత్త 6 గంగలు నింపుతుంది. B అనే గంగ ప్రవుత్త 18 గంగలు ఖాళీచేస్తుంది. అయితే ఏంతనమయించు ట్యూంక్ సిండుతుండు? ఖాళీనా?

$$\begin{array}{r} \text{A} \\ \text{B} \\ \hline \text{A} \oplus \text{B} \end{array} \begin{array}{l} 6 \times 1 \\ 18 \times -1 \\ \hline +2 \end{array}$$

$$\text{ABC రాశి} = \frac{18}{2} = 9 \text{ గంగలు నింపుతుంది.}$$

+ వ్యాపి సిండుతుంది, - వ్యాపి ఖాళీచేస్తుంది

Q4) ఒక ట్యూంక్ లో A గంగి ప్రవుత్త 10 గంగలు నించుతుంది. B అనే ప్రవుత్త 12 గంగలు లేదా, C అనే ప్రవుత్త 15 గంగలు లేదా ఖాళీచేస్తుంది? అయితే ట్యూంక్ సిండుతుండు? ఖాళీనా?

$$\begin{array}{r} \text{A} \\ \text{B} \\ \text{C} \\ \hline \text{ABC} \end{array} \begin{array}{l} 10 \times 6 \\ 12 \times 5 \\ 15 \times -4 \\ \hline +7 \end{array}$$

$$\text{ABC} = \frac{60}{7} = 8 \frac{4}{7} \text{ గంగల్లో నిండుతుంది.}$$

Q5)

$$\begin{array}{r} \text{A} \\ \text{B} \\ \text{C} \\ \hline \text{ABC} \end{array} \begin{array}{l} 20 \\ 30 \\ 12 \\ \hline -4 \end{array}$$

$$\text{వెత్తం} = \frac{60}{4} = 15 \text{ hrs to empty}$$

Q6) ఒక క్రింద ఉన్న ట్యూంక్ లో 4 గంగలు సింపుతుంది. కానీ లేకే వల్ల ట్యూంక్ నించుకొని 9 గంగలు పట్టింది. నిండి ద్వారా ట్యూంక్ లో లేకే వాత్రుము ఎంతనీ వట్ట ఖాళీచేయగలదు?

$$\begin{array}{r} \text{A} \\ \text{B} \\ \hline \text{A} \oplus \text{B} \end{array} \begin{array}{l} 4 \times 1 = 4 \\ ? \times -1 = 72 \\ 9 \times 8 \end{array}$$

$$B = \frac{72}{1} = 72 \text{ hrs.}$$

Q7) ఒక క్రింద ఉన్న ట్యూంక్ లో 6 గంగల్లో నింపగలదు. లేకే వల్ల 6 1/2 గంగలు పట్టింది. నిండి వాత్రుము ట్యూంక్ లో ఖాళీచేస్తుంది? లేకే వాత్రుము ఎంతనీ వట్ట ఖాళీచేస్తుంది?

$$8 \times 6 = 48$$

$$A \quad 6 \times 6.5$$

$$B \quad x - 0.5$$

$$A \oplus B \quad 6.5 \times 6$$

$$B = \frac{39}{0.5} = \frac{39}{1/2}$$

\*\*\*

1) A-10, B-15 గంభీర ట్ర్యూండ్ నింపగలవు.

ట్ర్యూండ్ సగం నింధిన అరాగత ఇంకెళ్ల విర్మించి ట్ర్యూండ్ సంధి  $1/4$  రీటున నీరు బయటకు వొక్కండి. ట్ర్యూండ్ నింపడసించి పట్టున సమయం? [AP SI 2016]

(A) 7 గం || (B)  $7\frac{1}{2}$  గం || (C) 8 గం || (d)  $8\frac{1}{2}$  గం ||

$$8 \times 6 = 48$$

$$A \quad 10 \times 3 = 30$$

$$B \quad 15 \times 2 = 30$$

$$A \oplus B \quad 5 = 30$$

30 గం

గం

$$= 15 చిత్తంగ్రహి$$

$$= \frac{15}{5}$$

$$= 3 \text{ hrs}$$

$$\text{మొత్తం} = 4 + 3 = 7 \text{ hrs}$$

7 గం ఉపయోగించి.

$$\begin{array}{r} \text{కొసా} \\ \hline 6, 6.5 \\ \hline = 39 \end{array}$$

$$8 \times 6 = 48$$

$$\begin{array}{r} A \quad 10 \times 6 \\ B \quad 12 \times 5 \\ C \quad 15 \times 4 \\ \hline \end{array}$$

కొసా

10, 12, 15

= 60

$$ABC \quad \times 15 = 60$$

$$4 \text{pm} - 5 \text{pm} \quad A \rightarrow 6$$

$$5 \text{pm} - 6 \text{pm} \quad A \oplus B \rightarrow 11$$

$$6 \text{pm} - 7 \text{pm} \quad ABC \rightarrow \frac{15}{32}$$

$$\text{మొత్తం} = 60 - 32 = 28$$

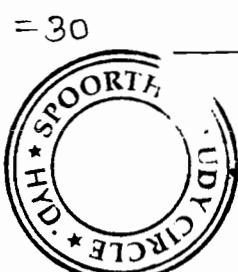
$$ABC = \frac{28}{15} = 1 \frac{13}{15} \text{ గం}$$

$$= 1 \text{ గం} \frac{13}{15} \times \frac{60}{60}$$

$$= 1 \text{ గం} 52 \text{ సిమించులు}$$

$$\Rightarrow 7 \text{pm} + 1 \text{hr } 52 \text{ min} \Rightarrow 8 \text{ గం } 52 \text{ pm}$$

\*\*\*



R.S. AGGREGATE BOOK

15 చిత్తంగ్రహి

$$\text{సామర్థ్య} = 5 \left( \text{సామర్థ్య} \frac{1}{4} \text{ తగ్గిలు} \right)$$

$$\text{తుండ్ర సామర్థ్య} = 5 \times \frac{3}{4}$$

$$= \frac{15}{4}$$

$$= \frac{15}{4} = 4 \text{ hrs}$$

$$\text{మొత్తం} = 4 + 3 = 7 \text{ hrs}$$

7 గం ఉపయోగించి.

2) A-10, B-12, C-15 గంభీర ట్ర్యూండ్ ని

నింపగలవు ప్రింటు కాను 4pm కి, Pipe B ను

5pm కి, తొలు C కి 6pm కి తెరచినచో

ట్ర్యూండ్ కి సమయసించి నింపుతండి?

Pipes & Cistern K.S.Agarwal

$$\begin{array}{r}
 \textcircled{1} \quad A - 20 \times 3 = 60 \\
 \textcircled{1} \quad B - 30 \times 2 = 60 \\
 \hline
 \textcircled{1} \quad A \oplus B = \frac{60+12}{5} = 12 \text{ pipes}
 \end{array}$$

$$\begin{array}{r}
 \textcircled{2} \quad A - 4 \times 9 = 36 \\
 \textcircled{2} \quad B - 9 - 4 = 36 \\
 \hline
 \textcircled{2} \quad A \oplus B = \frac{36+36}{5} = 7.2 \text{ hrs.}
 \end{array}$$

$$\begin{array}{r}
 \textcircled{3} \quad A - 6 \times 1 \\
 \textcircled{3} \quad B - 6 \times 1 \\
 \textcircled{3} \quad C - 6 \times 1 \\
 \textcircled{3} \quad D - 6 \times 1 \\
 \hline
 \textcircled{3} \quad ABCD = 4
 \end{array}$$

$$\begin{array}{r}
 \boxed{6 \text{ డాట్సులు తెలుగు}}
 \end{array}$$

$$\text{Total} = 3 \text{ hrs } 45 \text{ min.}$$

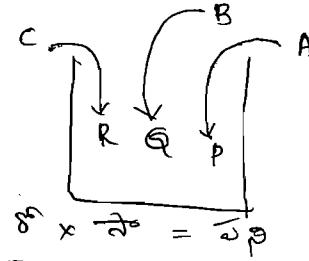
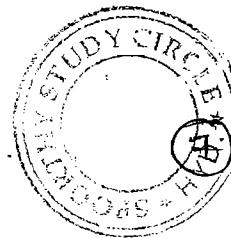
$$\begin{array}{r}
 \textcircled{4} \quad A - 10 \times 3 = 30 \\
 \textcircled{4} \quad B - 6 \times 5 = 30 \\
 \hline
 \textcircled{4} \quad A \oplus B = \frac{30+30}{2} = 30 \text{ min to empty.}
 \end{array}$$

$$\begin{array}{r}
 \textcircled{4} \quad A \oplus B = \frac{12}{2} = 6 \text{ min to empty.}
 \end{array}$$

$$\text{కొను} = 60$$

$$\begin{array}{r}
 \textcircled{5} \quad A - 5 \times 6 = 30 \\
 \textcircled{5} \quad B - 10 \times 3 = 30 \\
 \textcircled{5} \quad C - 30 \times 1 = 30 \\
 \hline
 \textcircled{5} \quad ABC = \frac{30+30+30}{10} = 3 \text{ hrs.}
 \end{array}$$

$$\begin{array}{r}
 \textcircled{6} \quad A - 5 \times 12 = 60 \\
 \textcircled{6} \quad B - 6 \times 10 = 60 \\
 \textcircled{6} \quad C - 12 \times 5 = 60 \\
 \hline
 \textcircled{6} \quad ABC = \frac{60+60+60}{17} = 3 \frac{9}{17} \text{ hrs to fill.}
 \end{array}$$



PAR య  
రసాయనక్రియలు

$$\text{కొను} = 60$$

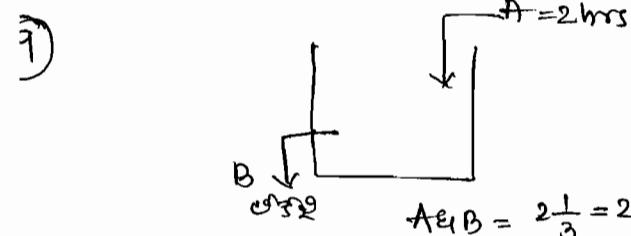
$$\begin{array}{r}
 \textcircled{7} \quad A - 30 \times 2 = 60 \\
 \textcircled{7} \quad B - 20 \times 3 = 60 \\
 \textcircled{7} \quad C - 10 \times 6 = 60 \\
 \hline
 \textcircled{7} \quad ABC = 11
 \end{array}$$

మసత్తు Confuse  
చేయబడు రిహిష్టు  
ఎంచు.

$$R \text{ తుసువుతో} = \frac{6}{11} \left( \text{ఒక్క విషాటంకైన....} \right) \quad \text{1 గం, 2 సం, 3 సం మి.}$$

$$\begin{array}{r}
 \textcircled{8} \quad A - 60 \times 5 = 300 \\
 \textcircled{8} \quad B - 75 \times 4 = 300 \\
 \textcircled{8} \quad C - 9 \times (-3) = -27 \\
 \hline
 \textcircled{8} \quad ABC = \frac{300+300-27}{6} = 97.5 \text{ min}
 \end{array}$$

$$C \text{ లింఘ} = \frac{300}{C \text{ నొ}} = \frac{300}{3} = 100 \text{ గం శ్రావణస్తంధి.}$$



$$A - \frac{8}{x} \times \frac{1}{2} = \text{వీణ}$$

$$B - 2 \times 2.33 = 4.66$$

$$\underline{A+B} \quad 2.33$$

$$A+B = 2\frac{1}{3} = 2.33$$

$$\text{కొను} = 2 \times 2.33$$

$$AB\text{ప్రాంతము} = \frac{\text{వీణ}}{AB\text{సామాన్యము}}$$

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

Now Go with Options.  $x = 6$

(OR)

$$\frac{4}{1} = \frac{x(x+6)}{2x+6}$$

$$8x + 24 = x^2 + 6x$$

$$x^2 - 2x - 24 = 0$$

2)

$$8 \times \frac{1}{x} = \text{వీణ}$$

$$\text{కొను} = 20$$

$$A - 5 \times 4 = 20$$

$$B - 20 \times 1 = 20$$

$$\underline{A+B} \quad x \times 5 = 20$$

$$A+B = \frac{20}{5} = 4 \text{ hrs.}$$

$$30 \text{ రోహితాచిలంగ్జు} = \frac{1}{2} \text{ hrs} = 0.5 \text{ hrs.}$$



12)  $A - \text{ప్రాంతము}$

$B - \text{త్వరగా}$

$$A - 144 \times 1 = 144$$

$$B - \underline{\quad} \times 3 = 144$$

$$\underline{A+B} \quad 36 \times 4 = 144$$

వీగం | వీసిమంతుడు | సామాన్యాగ్గలవడు | ఇంటి ఎదలన్ను లేకపోతి...

$$4 \times 4.5 = 18$$

ప్రాంతము

13)  ~~$\text{సామాన్యము} A:B = 1:2$~~

 ~~$\text{సామాన్యము} B:C = 1:2$~~

$$A:B:C = 1:2:4$$

$$A - 85 \times 1 = 35$$

$$B - 2 = 35$$

$$C - 4 = 35$$

$$\underline{ABC} \quad 5 \times 7 = 35$$

3)  $8 \times \frac{1}{x} = \text{వీణ}$

$$A - x \quad x+6$$

$$B - x+6 \quad x$$

$$\underline{AB} \quad 4 \quad 2x+6$$

$$x \times x+6$$

ప్రాంతము

$$14. A = x + 5$$

$$B = x$$

$$C = x - 4$$

$$A - x+5 \quad x = 2x$$

$$B \quad x \quad x+5$$

$$C \quad \underline{2x+5}$$

$$A+B = \frac{x(x+5)}{2x+5}$$

$$A+B-C=0$$

$$\frac{x(x+5)}{2x+5} = x-4$$

$$x^2 + 5x = 2x^2 - 3x - 20$$

$$x^2 - 8x - 20 = 0$$

$$x^2 - 10x + 2x - 20 = 0$$

$$x(x-10) + 2(x-10) = 0$$

$$(x-10)(x-2) = 0$$

$$x = 10 \text{ or } 2,$$

$$A = 15 \text{ సెక్షను} \quad \leftarrow \quad 5 \text{ టాల్లు ప్రాంతముగా$$

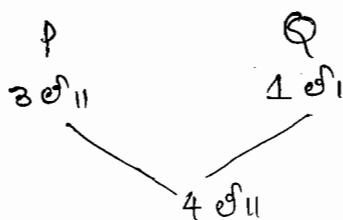
$$B = 10 \text{ సెక్షను}$$

15)

Total Quality = Bucket size  $\times$  No. of buckets

$$= 13.5 \text{ ఎఫ్} \times 12 = 9 \text{ ఎఫ్} \times x$$

$$x = 18$$



$$P \text{ తో } 60 \text{ సెక్షను } \overline{\text{మొత్తం నీరు}} = 60 \times 3 \text{ ఎఫ్} \\ = 180 \text{ ఎఫ్లు}$$

మొత్తం  
 $x(x+5)$

$$= \frac{180 \text{ ఎఫ్లు}}{4 \text{ ఎఫ్లు}}$$

$$P+Q = 45 \text{ సెక్షను}.$$

17)

$$8 \times 9 = 72$$

$$A \quad 12 \times 5 = 60$$

$$B \quad 15 \times 4 = 60$$

$$A+B \quad 9 = 60$$

కుటుంబము = 60

$$A+B \text{ ల } 3 \text{ రోడుల వెని } = 3 \times 9 = 27 \text{ buildings}$$

$$\text{మిగిలిన వెని } = 60 - 27 \Rightarrow 33 \text{ buildings}$$

$$B \text{ రోడు } = \frac{33}{3 \text{ సెక్షను}} = \frac{33}{4} = 8 \frac{1}{4}$$

$$\Rightarrow 8 \text{ min. } 15 \text{ Sec.}$$

18)

$$8 \times 9 = 72$$

$$A \quad 15 \times 4 = 60$$

కుటుంబము = 60

$$B \quad 20 \times 3 = 60$$

$$A+B \quad 7 = 60$$

$$A+B \text{ ల } 4 \text{ రోడుల వెని } = 7 \times 4 = 28 \text{ buildings.}$$

$$\text{మిగిలిన వెని } = 60 - 28 = 32 \text{ buildings.}$$

$$B \text{ రోడు } = \frac{32}{2} = 10 \frac{2}{3} \text{ min.}$$

$$= 10 \text{ min } \frac{2}{3} \times \frac{60}{60}$$

$$= 10 \text{ min } 40 \text{ sec.}$$

$$\overline{\text{మొత్తం రోడు}} = 4 + 10 \text{ min } 40 \text{ sec}$$

$$= 14 \text{ min } 40 \text{ sec.}$$

19)

$$8 \times 9 = 72$$

$$A \quad 15 \times 20 = 300$$

కుటుంబము = 300

$$B \quad 20 \times 15 = 300$$

$$C \quad 25 \times 12 = 300$$

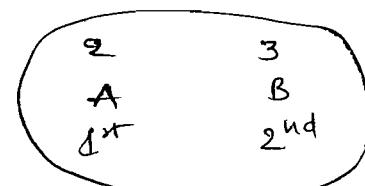
$$A+B+C \quad 23$$

$$A+B+C \text{ ల } 10 \text{ రోడుల వెని } = 23 \times 10 = 230 \text{ buildings}$$

$$\text{మిగిలిన వెని } = 300 - 230 = 70 \text{ buildings.}$$

$$A \& B \text{ గంభీరము } = \frac{10}{10+2} = \frac{10^2}{35} = 2 \text{ గంభీరము}$$

ప్రమత్తము =  $10 + 2 = 12 \text{ days.}$



అంతిమ విషయము 2 గంభీరము ప్రమత్తము.

12 లభించును 5 దినాలు.

$$= \frac{12}{5}$$

= 2 pairs + 2 extra buildings

= 4 days + 1 day

= 5 days.

$$\begin{array}{rcl} 10 & \times & 2 = 20 \\ A & 60 & \times 2 = 120 \\ B & 40 & \times 3 = 120 \\ \hline A \& B & 5 \end{array}$$

క్రమికంగా సహితము =  $2 \times 5 = 10$

$$\begin{array}{ccc} (B) & & (A \& B) \\ \swarrow & & \searrow \\ \text{విషయము} & & \text{విషయము} \\ x & & x \\ x & & x \\ \times 3 & & \times 5 \end{array}$$

$$3x + 5x = 120$$

$$8x = 120$$

$$x = 15$$

$$150 = 2x$$

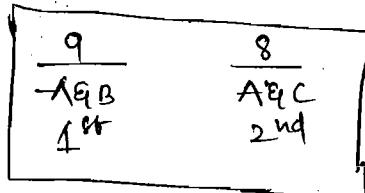
$$= 2(15)$$

$$= 30 \text{ గంభీరము.}$$



$$\begin{array}{rcl} 8 & \times & 2 = 16 \\ A & 12 & \times 5 = 60 \\ B & 15 & \times 4 = 60 \\ C & 20 & \times 3 = 60 \\ \hline ABC & 12 = 60 \end{array}$$

కొరకు  
60



అంతిమ విషయము 2 గంభీరము ప్రమత్తము.

60 లభించును 17 దినాలు.

$$= \frac{60}{17}$$

= 3 pairs + 9 extra

= 6 days + 1 day

= 7 days.

$$\begin{array}{rcl} 8 & \times & 2 = 16 \\ A & 12 & \times 5 = 60 \\ B & 15 & \times 4 = 60 \\ C & 20 & \times 3 = 60 \\ \hline ABC & 1 = 60 \end{array}$$

$A \& B \& C \text{ గంభీరము } = 5 \times 9 = 45 \text{ గంభీరము}$

$$A \& B \& C = \frac{45}{1} = 45 \text{ min.}$$

$$\begin{array}{rcl} 8 & \times & 2 = 16 \\ A & 6 & \times 2 = 12 \\ B & 4 & \times 3 = 12 \\ \hline A \& B & 5 = 12 \end{array}$$

కొరకు  
12

(24)

$$\begin{array}{l} \uparrow \quad \downarrow \\ \text{విషయము} = x \text{ m}^3/\text{min} \\ \downarrow \quad \uparrow \\ \text{విషయము} = (x+o) \text{ m}^3/\text{min} \end{array}$$

$$\text{టలు} = \frac{\text{ధూఫ్రామార్గము}}{\text{వెలు విషయము}}$$

లిండదస్సిః  $t_1$  - భూర్జచేంద్రదస్సిరేతెలు  $t_2 = 8$  గి.

$$\frac{2400}{x} - \frac{2400}{x+10} = 8 \text{ గి.}$$

$$\frac{2400}{300} \left( \frac{x+10 - x}{x(x+10)} \right) = 8$$

$$3000 = x(x+10)$$

from here go with Options.

$$x = 50 \text{ అనుమతము.}$$

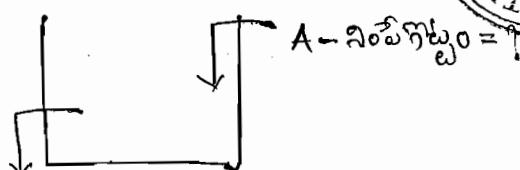
$$x^2 + 10x - 3000 = 0$$

$$x^2 + 60x - 50x - 3000 = 0$$

$$x(x+60) - 50(x+60) = 0$$

$$x=50, x=-60 \text{ అవుతాయి.}$$

25



$$B = 8 \text{ గి. } \text{ఫోటో}, \quad A+B = 12 \text{ గి. } \text{ఫోటో}$$

$$A \quad 8 \times 1 = 8 \text{ గి.}$$

$$\text{కొఱగు} = 24$$

$$\begin{array}{r} B \quad 8 \times -3 = 24 \\ \hline A+B \quad 12 \times -2 = 24 \end{array}$$

$$A \text{ రూపాయి} = \frac{24}{1} = 24 \text{ గి. } \text{ఫోటో} \rightarrow A \text{ ట్రైప్ ను} \\ \text{దింబుతారు.}$$

$$A - 1 \text{ నిమి} \rightarrow 6 \text{ గి.}$$

$$24 \times 60 \text{ గి.} \rightarrow ?$$

$$= 6 \times 24 \times 60 \text{ లింగులు}$$

$$= 8640 \text{ లింగులు.}$$

26

$$A \quad 8 \times 1 = 8 \text{ గి.}$$

$$B \quad 20 \times 6 = 120$$

$$\text{కొఱగు} = 120$$

$$C \quad 24 \times 5$$

$$D \quad ? \times -3$$

$$\begin{array}{r} ABC \quad 15 \times 8 \\ \hline \end{array}$$

$$C \text{ రూపాయి} = \frac{120}{3} = 40 \text{ నిమిశము}$$

$$\text{ట్రైప్ పామ్మెంటు} = 40 \times 3 \text{ gallery} \\ = 120 \text{ ట్రైప్ ను.}$$

27

$$A \quad 80 \times 3 = 240$$

$$B \quad 45 \times 10 = 450$$

$$\begin{array}{r} ABC \quad \times 22 = 450 \\ \hline \end{array}$$

A+B

$$x \text{ నిమిశము}$$

$$\times 22$$

A

$$(30-x) \text{ నిమిశము}$$

$$\times 12$$



28

$$22x + 12(30-x) = 450$$

$$10x = 90$$

$$x = 9$$

$$\begin{array}{l} 360-x = 450 \\ x = 450-360 \\ = 90 \end{array}$$

$$ABC \text{ రూపాయి} = 6 \text{ గి.}$$

$$ABC \text{ కొఱగు వర్ణి} = \frac{1}{6}$$

$$ABC \text{ కొఱగు వర్ణి} = \frac{1}{7} \times \frac{1}{6} = \frac{1}{42} \text{ విండు}$$

$$\text{విండు వర్ణి} = \frac{2}{3} \text{ Work}$$

$$A+B \quad \frac{2}{3} \text{ Work} = 7 \text{ days.}$$

$$A+B \quad W = \frac{21}{2} = 10.5$$

$$A+B \quad 10.5 \times 6$$

$$\text{కొఱగు} = 10.5 \times 6$$

$$C \quad ? \times 4.5$$

$$\begin{array}{r} ABC \quad 6 \times 10.5 \\ \hline \end{array}$$

$$C \text{ రూపాయి} = \frac{\text{మెత్తా వర్ణి}}{\text{C నిమిశము}}$$

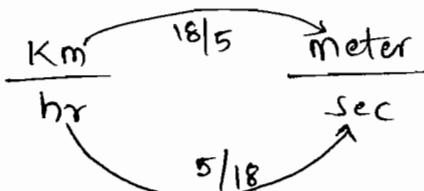
$$= \frac{7}{10+5} \times \frac{6^2}{45}$$

$$= 14 \text{ ట్రైప్ ను.}$$

BASICs:

$$1. \text{ వీర్గం} = \frac{\text{దూరం}}{\text{సమయం}} = \text{Speed} = \frac{\text{distance}}{\text{time}}$$

$$\frac{1 \text{ km}}{1 \text{ hr}} = \frac{5 \text{ m}}{\frac{60 \times 60 \text{ sec}}{3}} = \frac{5}{18} \text{ m/sec}$$



Example:

$$54 \text{ km/hr} \rightarrow \text{m/sec} =$$

$$2. \text{ Speed} = \frac{\text{distance}}{\text{time}} \left( S = \frac{d}{t} \right)$$

$$(i) \text{ వీర్గం} = \frac{\text{దూరం}}{\text{సమయం}}$$

$$S = \frac{d}{t} \quad d \propto t \Rightarrow \frac{d_1}{d_2} = \frac{t_1}{t_2}$$

$$(ii) \text{ దూరం} = \frac{\text{వీర్గం}}{\text{సమయం}}$$

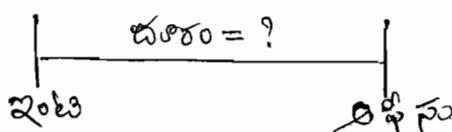
$$S = \frac{d}{t} \Rightarrow S \propto \frac{1}{t} \Rightarrow \frac{S_1}{S_2} = \frac{t_2}{t_1}$$

$$(iii) \text{ సమయం} = \frac{\text{దూరం}}{\text{వీర్గం}}$$

$$S = \frac{d}{t} \Rightarrow S \propto d \Rightarrow \frac{S_1}{S_2} = \frac{d_1}{d_2}$$

Late - Early Problems

1)



$$1 \text{ వచ్చి } 30 \text{ km/h } 10 \text{ నిమిటల స్థాపన}$$

$$2 \text{ వచ్చి } 40 \text{ km/h } 5 \text{ నిమిట తొందరగం}$$

$$2. \quad 1 \text{ వచ్చి } 60 \text{ km/h } 20 \text{ నిమిటల స్థాపన}$$

$$2 \text{ వచ్చి } 90 \text{ km/h } 10 \text{ నిమిట తొందరగం}$$

$$Q3 \quad \begin{array}{lll} 1 \text{ వచ్చి } & 45 \text{ km/h} & 5 \text{ నిమిట తొందరగం} \\ 2 \text{ వచ్చి } & 60 \text{ km/h} & 20 \text{ నిమిట తొందరగం} \end{array}$$

$$Q4 \quad \begin{array}{lll} 1 \text{ వచ్చి } & 120 \text{ km/h} & 15 \text{ నిమిట తొందరగం} \\ 2 \text{ వచ్చి } & 80 \text{ km/h} & 5 \text{ నిమిటల స్థాపన} \end{array}$$

$$1A: \quad t_1 - t_2 = 15 \text{ నిమిట}$$

$$\frac{d_1}{s_1} - \frac{d_2}{s_2} = 15 \text{ నిమిట}$$

$$\frac{d}{30} - \frac{d}{40} = \frac{15}{60} \text{ నిమిట}$$

$$\frac{4d - 3d}{120} = \frac{15}{60} = \frac{1d}{2} = 15$$

$$d = 30 \text{ km} \checkmark$$

Shortcut Method:

$$\text{ప్రాథమిక సమానం} = [30, 40] = 120$$

$$\text{శూషు - ప్రాథమిక దూరం} = 120 \text{ km అఱ్మోదించి}$$

$$\text{శూషు} \quad \text{వీర్గం} \quad \text{సమయం} = \frac{\text{దూరం}}{\text{వీర్గం}}$$

$$1 \text{ వచ్చి } 120 \text{ km } 30 \text{ km/h } 4 \text{ hrs} \xrightarrow{4 \text{ hrs}} \text{శూషు}$$

$$2 \text{ వచ్చి } 120 \text{ km } 40 \text{ km/h } 3 \text{ hrs} \xrightarrow{3 \text{ hrs}} \text{శూషు}$$

శూషు దూరం

$$60 \text{ నిమిట} \rightarrow 120 \text{ km}$$

$$15 \text{ నిమిట} \rightarrow ?$$

$$\frac{15 \times 120}{60} = 30 \text{ km}$$

2A:

$$\text{ప్రాథమిక సమానం} = [60, 90] = 180$$

$$\text{శూషు - ప్రాథమిక దూరం} = 180 \text{ km అఱ్మోదించి}$$

$$\text{శూషు} \quad \text{వీర్గం} \quad \text{సమయం} = \frac{\text{దూరం}}{\text{వీర్గం}}$$

$$1 \text{ వచ్చి } 60 \text{ km } 60 \text{ km/h } 3 \text{ hrs} \xrightarrow{3 \text{ hrs}} \text{శూషు}$$

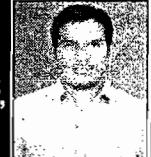
$$2 \text{ వచ్చి } 90 \text{ km } 90 \text{ km/h } 2 \text{ hrs} \xrightarrow{2 \text{ hrs}} \text{శూషు}$$

R S Agarwal Bit to Bit by Sagar Sir @Spoorthy Ashok Nagar- 6303450967

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$$\begin{array}{l}
 \text{తేద్ద} \quad \text{చూర్చి} \\
 60 \text{ min} \longrightarrow 180 \text{ km} \\
 10 \text{ min} \longrightarrow \\
 \frac{10 \times \frac{1}{60}}{\frac{1}{60}} = 30 \text{ km}
 \end{array}$$

Q3A: వీగాల రసాను =  $\underline{[45, 60]} = 180$

$$\begin{array}{l}
 \text{డిఫెంచర్యూ} = 180 \text{ km} \\
 \text{చూర్చి} \quad \text{వీగా} \quad \text{కాలి} = \frac{\text{చూర్చి}}{\text{వీగా}}
 \end{array}$$

1st 180 km 45 4 hrs  
2nd 180 km 60 3 hrs  $\leftarrow$  తేద్ద 1 hr  
60 min

$$\begin{array}{l}
 60 \text{ min} \longrightarrow 180 \\
 15 \text{ min} \longrightarrow ? \\
 \frac{15 \times \frac{1}{60}}{\frac{1}{60}} = 45 \text{ km}
 \end{array}$$

Q4A: వీగాల రసాను =  $\underline{[120, 80]} = 240$

$$\begin{array}{l}
 \text{డిఫెంచర్యూ} = 240 \text{ km} \\
 \text{చూర్చి} \quad \text{వీగా} \quad \text{కాలి} = \frac{\text{చూర్చి}}{\text{వీగా}}
 \end{array}$$

1st 240 km 120 2 hrs  
2nd 240 km 80 3 hrs  $\leftarrow$  60 min  
60  $\longrightarrow$  240  
20 min  $\longrightarrow$  ?

$$\frac{20 \times \frac{4}{60}}{\frac{1}{60}} = 80 \text{ km.}$$



## Average Speed (సరిసరివీగా)

$$\text{సరిసరివీగా} = \frac{\text{మొత్తం దూరం}}{\text{మొత్తం కాలి}}$$

Example:

300 m	400 m	150 m	250 m	100 m
10 sec	15 sec	3 sec	20 sec	25 sec

$$\begin{aligned}
 \text{సరిసరివీగా} &= \frac{\text{మొత్తం దూరం}}{\text{మొత్తం కాలి}} \\
 &= \frac{1200 \text{ m}}{55 \text{ sec.}}
 \end{aligned}$$

Q1 | సగందూరం + సగం దూరం | లభింపువీగా = ?

$$\begin{aligned}
 \text{దూ} &= \frac{d}{2} \quad \text{దూ} = \frac{d}{2} \\
 \text{వీగా} &= 30 \quad \text{వీగా} = 40 \\
 \text{కాలి} &= \frac{d}{30}, \quad \text{కాలి} = \frac{d}{40} \\
 \text{కాలి} &= \frac{d}{60}, \quad \text{కాలి} = \frac{d}{80} \\
 \text{సగం దూరం} &= \frac{\text{మొత్తం దూరం}}{\text{మొత్తం కాలి}} \\
 &= \frac{\frac{d}{2} + \frac{d}{2}}{60} \\
 &= \frac{1}{4+3} \Rightarrow \frac{240}{7}
 \end{aligned}$$

Shortcut:

$$\text{వీగాల కసాను} = \underline{[30, 40]} = 120$$

మొత్త దూరాన్ని 120 km ఉసుటువచ్చి.

దూరం	120 km	120 km
వీగా	30 kmph	40 kmph

$$\text{కెమ్} = \frac{\text{దూరం}}{\text{వీగు}} = 4 \text{ hrs}, 3 \text{ hrs}$$

$$\text{వైగు} = \frac{\text{దూరం}}{\text{వీగు}} = \frac{240}{17}$$

$$4A: \text{కెసాగు} = \underline{[20, 15, 12]} = 60$$

$$\begin{array}{c} \text{దూరం} \\ \hline \text{వీగు} \end{array} \begin{array}{c} \frac{1}{4} & \frac{1}{4} & \frac{1}{2} \\ 60 \text{ km} & 60 \text{ km} & 120 \text{ km} \\ 20 \text{ km/h} & 15 \text{ km/h} & 12 \text{ km/h} \end{array}$$

$$\text{కెమ్} = \frac{\text{దూరం}}{\text{వీగు}} = 3 \text{ hrs}, 4 \text{ hrs}, 10 \text{ hrs}$$

$$\text{వైగు} = \frac{240}{17}$$

$$2) \quad \begin{array}{c} \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \\ 10 \text{ km/h} & 20 \text{ km/h} & 15 \text{ km/h} \end{array} \quad \text{దూరం}?$$

$$3) \quad \begin{array}{c} \frac{1}{4} & \frac{1}{4} & \frac{1}{4} & \frac{1}{4} \\ 10 \text{ km/h} & 20 \text{ km/h} & 12 \text{ km/h} & 15 \text{ km/h} \end{array} \quad \text{?}$$

$$4) \quad \begin{array}{c} \frac{1}{4} & \frac{1}{4} & \text{వీగు లేదా} \\ 20 \text{ km/h} & 15 \text{ km/h} & 12 \text{ km/h} \end{array} \quad \text{ప్రయత్ని వైగు?}$$

$$5) \quad \begin{array}{c} \text{సగు} & \text{సగు} \\ 24 \text{ km/h} & x \text{ km/h} \end{array} \quad \text{?}$$

$$6) \quad \begin{array}{c} \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \\ 10 \text{ km/h} & 20 \text{ km/h} & x \text{ km/h} \end{array} \quad \text{?}$$

: Answers:

$$1A: [10, 20, 15] \quad \text{కెసాగు} = 60,$$

ఉత్తీర్ణాశ్చర్య 60 km ల్లిస్తానువాద.

$$\begin{array}{c} \text{దూరం} \\ \hline \text{వీగు} \end{array} \begin{array}{c} 60 \text{ km} & 60 \text{ km} & 60 \text{ km} \\ 10 \text{ km/h} & 20 \text{ km/h} & 15 \text{ km/h} \end{array}$$

$$\text{కెమ్} = \frac{\text{వీగు}}{\text{దూరం}} = 6 \text{ hrs}, 3 \text{ hrs}, 4 \text{ hrs}$$

$$\begin{array}{c} \text{వైగు} \\ \hline \text{దూరం} \end{array} = \frac{\text{దూరం}}{\text{వీగు}} = \frac{180}{13}$$

$$3A: [10, 20, 12, 15] \quad \text{కెసాగు} = 60$$

ఉత్తీర్ణాశ్చర్య 60 km ల్లిస్తానువాద.

$$\begin{array}{c} \text{దూరం} \\ \hline \text{వీగు} \end{array} \begin{array}{c} 60 \text{ km} & 60 \text{ km} & 60 \text{ km} & 60 \text{ km} \\ 10 \text{ km/h} & 20 \text{ km/h} & 12 \text{ km/h} & 15 \text{ km/h} \end{array}$$

$$\text{కెమ్} = 6 \text{ hrs}, 3 \text{ hrs}, 5 \text{ hrs}, 4 \text{ hrs}$$

$$\text{వైగు} = \frac{40}{\frac{40}{3}} = \frac{40}{3} = 13 \frac{1}{3} \text{ km/h}$$



$$8) = \frac{48x}{x+24}$$

$$6x = 24+x$$

$$5x = 24$$

$$x = \frac{24}{5} \Rightarrow 4.8 \text{ km/h.}$$

$$6A: \text{కెసాగు} = [10, 20, x] = 20x$$

$$\begin{array}{c} \text{దూరం} \\ \hline \text{వీగు} \end{array} \begin{array}{c} 20x & 20x & 20x \\ 10 & 20 & x \end{array}$$

$$\begin{array}{c} \text{వీగు} \\ \hline \text{దూరం} \end{array} = \frac{\text{దూరం}}{\text{వీగు}} = \frac{60x}{3x+20}$$

$$= \frac{60x}{3x+20}$$

$$\frac{180}{11} \cancel{\times} \frac{60x}{3x+20}$$

$$9x + 60 = 11x$$

$$2x = 60$$

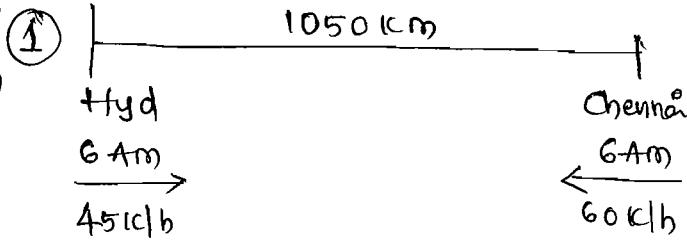
$$x = \frac{60}{2} \Rightarrow 30 \text{ km/h.}$$

## Time Taken to Meet / Catch.

కెంపుకొడుసి / వట్టికొడున్ని వట్టించుటయం:

$$\text{కెంపు.వట్టించుటయం} = \frac{\text{ఇద్దరిపుట్టుదురు}}{\text{సాహిత్య వీగ}} = \frac{ఇద్దరిపుట్టుదురు}{\text{సాహిత్య వీగం}}$$

### Questions:



(i) ఇద్దరు ఎంత సమయం తర్వాత కెంపాలు?

$$\text{సమయం} = \frac{\text{ఇ.దూ}}{\text{సా.వీ}} = \frac{1050 \text{ km}}{105 \text{ km/h}} = 10 \text{ hrs.}$$

(ii) ఇద్దరు ఏసమయసి కెంపాలు?  

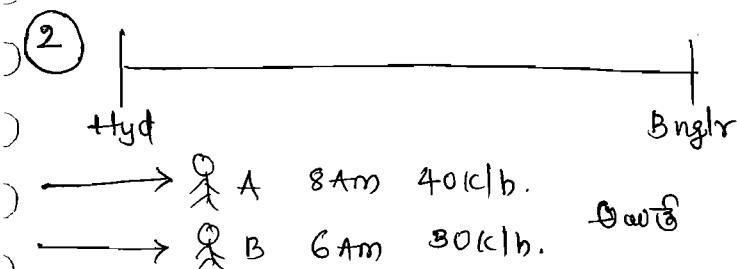
$$6 \text{ AM} + 10 \text{ hrs} \Rightarrow 4 \text{ PM.}$$

(iii) Hyd నుండి ఎంత దూరంగా కెంపాలు?

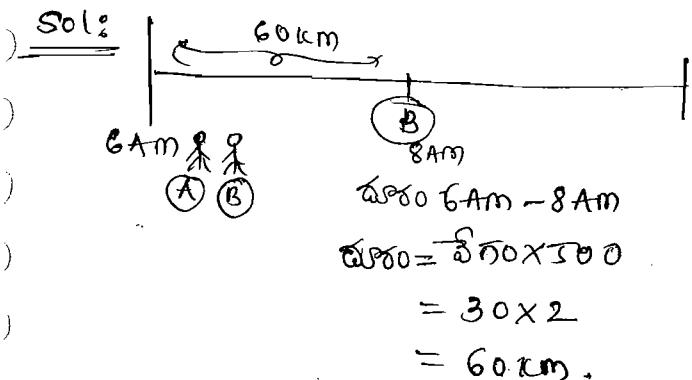
$$d = s \times t = 45 \times 10 = 450 \text{ km}$$

(iv) Chennai నుండి ఎంత దూరంగా కెంపాలు.

$$d = s \times t = 60 \times 10 = 600 \text{ km.}$$



'A' B ఏ సమయసికి కెంపాలు?

Sol: 

$$\text{సమయం} = \frac{\text{దూరం}}{\text{వీగం}} = \frac{60 \text{ km}}{30 \text{ km/h}} = 2 \text{ hours.}$$

## Relative Speed :

సాహిత్య వీగం :

Concept

① ఒకే ధిశలి తయార్చిస్తు...

$$\begin{array}{c} \rightarrow \\ 40 \text{ km/h} \end{array} \quad \begin{array}{c} \rightarrow \\ 30 \text{ km/h} \end{array} \quad \text{సాహిత్య వీగం} = 40 - 30 = 10 \text{ km/h.}$$

② వ్యక్తిగతి ధిశలి తయార్చిస్తు...

$$\begin{array}{c} \rightarrow \\ 40 \text{ km/h} \end{array} \quad \begin{array}{c} \leftarrow \\ 30 \text{ km/h} \end{array} \quad \text{సాహిత్య వీగం} = 40 + 30 = 70 \text{ km/h.}$$

(i) 3/వీ వట్టించుటయం =  $\frac{\text{ఇ.దూ}}{\text{సా.వీ}} = \frac{60 \text{ km}}{10 \text{ km/h}} = 6 \text{ hrs.}$

(ii) ఏసమయసి =  $8 \text{ AM} + 6 \text{ hrs} = 2 \text{ pm}$

(iii) Hyd నుండి దూరం =  $d = s \times t = 40 \times 6 = 240 \text{ kmrs.}$



$$\begin{aligned} \text{Hyd నుండి దూరం} &= d = \text{సా.వీ} \times t \\ &= 30 \times 6 \\ &= 180 \text{ km} \end{aligned}$$

B దూరం =  $180 + 60 = 240$

(3) 

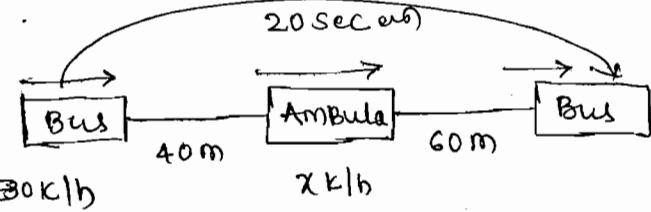
$$\begin{array}{c} \rightarrow \\ 72 \text{ km/h} \end{array} \quad \text{(ఒకే ధిశ)} \quad \begin{array}{c} \rightarrow \\ 54 \text{ km/h} \end{array}$$

వాస్తవంల్లో తర్వాత వట్టించుటయి (డిగ్గు) ?

$$\begin{aligned} \text{టెచు/వట్టి సమయం} &= \frac{\text{ఇ.దూరం}}{\text{సా.వీగం}} \\ \text{సా.వీగం} &= 72 - 54 \\ &= 18 \text{ km/h} \\ &= \frac{180}{18} \text{ m/s} \\ &= 10 \text{ m/s} \end{aligned}$$

(4) ఒక టీములక్కు తన వెనర్ 40 m దూరంలు టీము లుక్కు ఉన్న గమనించాడు. 20 సెక్షనల తరువాత లుక్కు బస్ట, టీములక్కు దూడి 60 m వించుట వేళించి. టీములక్కు చేగము లుక్కు బస్ట వీగం 30 km/h. అయితే అంటున్న వేగము ఎంత?

- (A) 10 km/h (B) 12 km/h (C) 15 km/h (D) 20 km/h.



30 km/h

$$\text{সময়} = \frac{20 \text{ sec}}{\text{কি.মি.}}$$

$$\begin{aligned} \text{সু.বি.} &= (30-x) \text{ km/h} \\ &= (30-x) \times \frac{5}{18} \end{aligned}$$

$$20 \text{ sec} = \frac{100 \text{ m} \times 18}{(30-x) \times 5}$$

$$30-x = 18$$

$$x = 30-18$$

$$x = 12 \text{ km/h}$$

### R.S. Agarwal Book Questions

$$) = 80 \text{ km/h}$$

$$= 80 \times \frac{5}{18} \text{ m/s}$$

$$= \frac{200}{9} \Rightarrow 22 \frac{2}{9}$$

$$) S = \frac{d}{t} = \frac{200 \text{ m}}{24 \text{ sec}}$$

$$= \frac{10}{24} \times \frac{18^3}{5}$$

$$= 30 \text{ km/h.}$$

$$) @ 25 \text{ m/s } (b) = 15 \text{ None}$$

$$) S = \frac{d}{t} = \frac{600 \text{ m}}{5 \times 60} = 2 \text{ m/s}$$

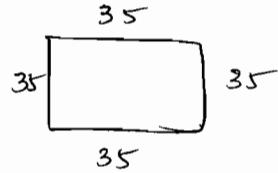
$$= 2 \times \frac{18}{5} \text{ km/h}$$

$$= \frac{36}{5}$$

$$= 7.2 \text{ km/h}$$

$$\begin{aligned} ) \text{ দূরত্ব} &= \text{বেগ} \times \text{সময়} \\ &= 5(\text{km}) \times 15 \text{ min} \\ &= 5 \times \frac{5}{18} \text{ m} \times 18 \times 60 \text{ sec} \\ &= 1250 \text{ m} \end{aligned}$$

6



$$\text{দূরত্ব} = 4a = 35 \times 4 = 140 \text{ m}$$

$$T = \frac{\text{দূরত্ব}}{\text{বেগ}} = \frac{140 \text{ m}}{\frac{18}{2} \text{ m/s}} = 56 \text{ sec}$$

$$7 d = s t$$

$$\text{দূরত্ব} = \text{বেগ} \times \text{সময়}$$

$$\begin{aligned} (\text{বি.}) &= 108 \text{ km/h} \times 15 \text{ sec} \\ &= 108 \times \frac{5}{18} \text{ m/s} \times 15 \end{aligned}$$

$$\text{দূরত্ব} = 450 \text{ m}$$

8

$$S = \frac{d}{t}$$



$$S_1 = \frac{d}{t} = \frac{300}{\frac{18}{2}} = 40 \text{ km/h}$$

$$S_2 = \frac{d}{t} = \frac{450}{9} = 50 \text{ km/h}$$

$$\frac{S_1}{S_2} = \frac{40}{50} = \frac{4}{5}$$

$$\text{পোতা} = 4 : 5.$$

9

$$S = \frac{d}{t}$$

$$S_1 = \frac{d}{t} = \frac{550 \text{ m}}{1 \text{ min}} = 550 \text{ m/min}$$

$$S_2 = \frac{d}{t} = \frac{33000 \text{ m}}{45 \text{ min}}$$

$$\frac{S_1}{S_2} = \frac{550}{\frac{33000}{45}} = \frac{60^4}{45^3} \quad (11 \times 5, 11 \times 3)$$

10

$$\frac{S_1}{S_2} = \frac{7}{8}$$

$$\frac{S_1}{100} = \frac{7}{25}$$

$$S_1 = 175/2 \Rightarrow 87.5 \text{ km/h}$$

$$\text{বেগ} = \frac{\text{দূরত্ব}}{\text{সময়}}$$

$$= \frac{100}{4} \text{ km/h}$$

$$= 25 \text{ km/h}$$

$$= 100 \text{ km/h}$$

$$11) 50+50+25+70+35 = 230$$

(6R)

$$d_1 = s \times t = \frac{50}{2} \times \frac{5}{2} = 125$$

$$d_2 = s \times t = \frac{35}{2} \times \frac{3}{2} = 105$$

$$d = d_1 + d_2 = 125 + 105 = 230$$

$$12) 21 \text{ సంఖ్యలు, } 20 \text{ సమస్యలు}$$

$$\text{పెత్తం దురుస్తలు} = 20 \times 50 \text{ m} = 1000 \text{ m}$$

$$1 \text{ అం} = 1 \text{ నిమి.} = 60 \text{ sec}$$

$$\text{వేగా} = \frac{\text{దూరం}}{\text{సమయం}} = \frac{1000 \text{ m}}{60 \text{ sec.}}$$

$$= \frac{1000}{60} \times \frac{18}{5} \text{ km/h}$$

$$= 20 \times 3 \rightarrow 60 \text{ km/h}$$

$$13) \text{చుట్టూ} = \text{వేగా} \times \text{సమయం}$$

$$= 1100 \text{ ft} \times \frac{11}{5} \text{ sec}$$

$$= 2420 \text{ feet}$$

$$14) \text{సాధారణము} = \frac{\text{దూరం}}{\text{వేగా}} = \frac{600}{100} = 6 \text{ hrs.}$$

ప్రశ్నలో 15 km లక్షిత రీతిలో Rest

600 km లక్షిత రీతిలో Rest కిలోమీటర్లు ?

$$= \frac{600}{75} = 8 \text{ కిలోమీటర్లు.}$$

$$15) \text{సాధారణము} = 8 - 7 = 1 \text{ కిలోమీటర్లు}$$

$$\text{Rest Time} = 7 \times 3 \text{ min} = 21 \text{ నిమిశాలు}$$

$$16) \text{పెత్తం సమయం} = 6 \text{ hrs} + 21 \text{ min} = 6 \text{ hr} 21 \text{ min.}$$

15) స్థితి

$$d_1 = d$$

$$t_1 = t$$

$$s_1 = \frac{d_1}{t_1} = \frac{d}{t}$$

ఉపాధి

$$d_2 = \frac{d}{2}$$

$$t_2 = 2t$$

$$s_2 = \frac{d_2}{t_2} = \frac{d_2}{2t} = \frac{d}{4t}$$

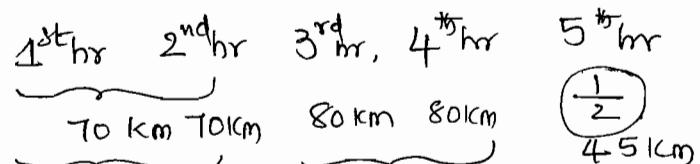
$$= \frac{d}{2} \times \frac{1}{2t} \Rightarrow \frac{d}{4t}$$

$$\frac{\text{ప్రయాగాలై}}{\text{సమయం}} = \frac{s_2}{s_1} = \frac{\frac{d}{4t}}{\frac{d}{t}} = \frac{1}{4}$$

So, 1 : 4 అప్పుతుంది.

16)

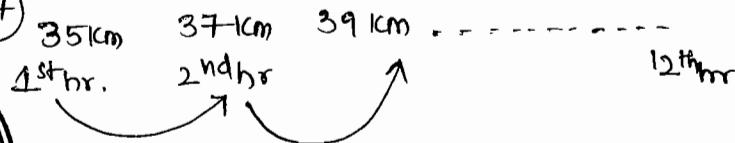
$$\text{వేగా} = 70 \text{ km/h}$$



$$\text{వేగా} = 70 \text{ km/h}, \quad \text{వేగా} = 80 \text{ km/h}, \quad \text{వేగా} = 90 \text{ km/h}$$

$$\Rightarrow \text{పెత్తం సమయం} = 4 \text{ hrs} + \frac{1}{2} (4 \frac{1}{2})$$

17)



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

$$\left. \begin{array}{l} 35, 37, 39, \dots, 12 \text{ ఎడ్సులు} \\ 35 + 37 + 39 + \dots (n) \\ n = 12, a = 35, d = 2 \end{array} \right\}$$

n ఎడ్సుల పెత్తం

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

$$= \frac{12}{2} (2 \times 35 + (12-1) \times 2)$$

$$= 6(70+22)$$

$$= 6(92)$$

$$= 552$$

18)

$$\text{వేగా} = \frac{\text{దూరం}}{\text{సమయం}} = \frac{10 \text{ km}}{\frac{12}{5} \text{ hrs}} = 50 \text{ km/h}$$

$$s_1 = 50 \text{ km/h}$$

$$s_2 = 45 \text{ km/h}$$

$$s = \frac{d}{t} \rightarrow \text{దూరం స్థితి}$$

$$\frac{s_1}{s_2} = \frac{t_2}{t_1}$$

10  
50       $\times$       t<sub>2</sub> 9  
45      X      12 01  
s<sub>3</sub>      4

$$t_2 = \frac{40}{3} = 13\frac{1}{3} \text{ min}$$

$$= 13\frac{1}{3} \times \frac{60}{60} \text{ sec}$$

$$= 13 \text{ min } 20 \text{ sec.}$$

(19)

350 km

$s = 80 \text{ km/h}$ $t = \frac{21}{4} = \frac{9}{4} \text{ hrs}$ $d = s \times t$ $= 80 \times \frac{9}{4}$ $= 180 \text{ km}$	$60 \text{ km/h}$ $\text{విధిలన దూరం} = 350 - 180$ $= 170$ $\frac{170}{60} = \frac{\text{దూరం}}{\text{విధి}}$ $= \frac{170}{60} \text{ km/h}$ $= 2 \frac{5}{6} \text{ hrs}$ $= 2 \text{ hrs } \frac{5}{6} \times \frac{60}{60}$ $= 2 \text{ hrs. } 50 \text{ min.}$	$\frac{s_1}{s_2} = \frac{t_2}{t_1}$ $\frac{20}{20+x} = \frac{\frac{5}{3}}{\frac{2}{3}}$ $\frac{20}{20+x} \times \frac{2}{3} =$ $20+x = 30^{(-)}$ $x = 10$
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వ్యాతికొనుతాడో = 2 hrs. 15 min.  
+ 2 hrs. 50 min.  
5 hrs. 5 min

నమియేసి = 5:20 AM + 5 hrs 5 min  
= 10:25 AM.

దూరం = విధి  
s =  $\cancel{v}/t$

$$\frac{s_1}{s_2} = \frac{t_2}{t_1} \Rightarrow \frac{240}{s_2} \cancel{\times} \frac{\frac{5}{3} \text{ hrs}}{5 \text{ hrs}}$$

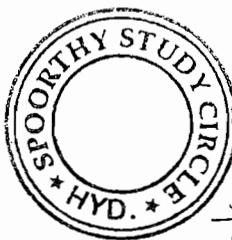
$$s_2 = 240 \times 3$$

$$s_2 = 720 \text{ km/h.}$$

(21)

$$50 \text{ km } t_1 = \frac{5}{2} \text{ hrs. } \frac{5}{6} \text{ hrs ఉంటాయి.}$$

$$\frac{5}{6} \text{ hrs } = \frac{1}{E} \Rightarrow \frac{\frac{10}{50}}{\frac{5}{2}} = 20 \text{ km/h}$$



$$t_2 = \frac{5}{2} - \frac{5}{6}$$

$$= \frac{10^5}{6^3} \Rightarrow \frac{5}{3}$$

$$s = \frac{x}{t} \rightarrow d \text{ కిమీ}$$

$$\frac{s_1}{s_2} = \frac{t_2}{t_1}$$

$$\frac{20}{20+x} = \frac{\frac{5}{3}}{\frac{2}{3}}$$

$$\frac{20}{20+x} \times \frac{2}{3} =$$

$$20+x = 30^{(-)}$$

$$x = 10$$

(22)

6 km (45 నిమి)

$3 \text{ km}$ $\frac{1}{\text{విధి}}$	$3 \text{ km}$ $(\text{సగి})$	$\frac{2}{3} \times 45 \text{ నిమి} \Rightarrow 30 \text{ నిమి పాశు}$
---	----------------------------------	---

$$\text{విధి దూరం} = 45 - 30 \Rightarrow 15 \text{ నిమి పాశు}$$

$$\text{విధి} = \frac{\text{దూరం}}{5 \text{ నిమి}} = \frac{3 \text{ km}}{\frac{15}{60} \text{ hr}} = 12 \text{ km/hr.}$$

(23)

3 రో      2 రో      టెలిఫిం

$\frac{3 \times 4}{5 \times 4} = \frac{12}{20}$	$\frac{1}{20}$	$\frac{1}{20}$
---	----------------	----------------

$$\text{విధి} = \frac{1}{20}$$

$$\text{వ్యాతికొనుతాడో = } x \text{ km}$$

$$x \times \frac{1}{20} = 675 \text{ km}$$

$$x = 135 \text{ km.}$$

24 వ్యక్తి తన తలపరాగీనిసి

నమయం

తేసలనవ్విడు. - ప్రయాణికొన్ని

కొండ నుక్క 24 Km/h త్రయగీన్న మొత్తందుళం?

$$\text{అసాగు} = \frac{(21, 24)}{3} =$$

$$= \frac{7 \times 8}{(3 \times 7 \times 8)} = 168$$

$$\text{ధర్మం} = 168 \text{ km}$$

నదు

$$\text{ధర్మం} = 168 \text{ km}$$

సగ్గు

$$\text{వేగం} = 21 \text{ km/h}$$

$$\text{వేగం} = 24 \text{ km/h}$$

$$\text{సాధం} = 8 \text{ hrs}$$

$$\text{సాధం} = 7 \text{ hrs.}$$

$$\text{మొత్తందుళం} = 336 \text{ km} (168 + 168)$$

$$\text{మొత్తం సాధం} = 8 + 7 \Rightarrow 15 \text{ hrs.}$$

(నమయం)

$$15 \text{ గంగా} \rightarrow 336 \text{ km}$$

$$10 \text{ గంగా} \rightarrow ?$$

$$\Rightarrow \frac{10 \times 336}{15} (2 \times 112) \Rightarrow 224 \text{ km}$$

$$25 \quad \text{కెసి} \quad [3, 4, 5] \Rightarrow 60$$

$$\begin{array}{c} \text{ధర్మం} | 60 \text{ km} & 60 \text{ km} & 60 \text{ km} \\ \text{వేగం} | 3 \text{ km/h} & 4 \text{ km/h} & 5 \text{ km/h} \end{array}$$

$$\text{సాధం} = 20 \text{ hrs.}, \quad 15 \text{ hrs.}, \quad 12 \text{ hrs.}$$

ట్రయిదుళాన్ని 60 km ఉసుకొనువు.

$$\text{ఎడినటి వేగం} = \frac{\text{మొత్తం దూరం}}{\text{మొత్తం సాధం}} = \frac{180 \text{ km}}{47} = 3.8 \text{ km/h}$$

$$\text{ధర్మం} = \text{వేగం} \times \text{సాధం}$$

$$= \frac{180 \text{ km}}{47 \text{ km}} \times \frac{47}{60} \text{ hrs} = 3 \text{ km}$$

26 G1 Km

ధర్మం రథం క్రమించు

క్రమించు

$$\text{వేగం} \quad x \text{ km} \quad \frac{x}{4} \text{ hrs}$$

$$(G1-x) \text{ km} \quad \frac{(G1-x)}{9} \text{ hrs}$$

$$\text{సాధం} = \frac{x}{4} \left( \frac{x}{4} \right) \quad \left( \frac{G1-x}{9} \right)$$

$$\text{సాధం} = \frac{x}{4} + \frac{G1-x}{9} = 9 \text{ hrs.}$$

$$\frac{9x + 244 - 4x}{36} = 9$$

$$5x = 36 \times 9 - 244$$

$$5x = 324 - 244$$

$$5x = 80$$

$$x = 16$$



27

$$A \text{ వేగం} = x \text{ km/h}$$

$$B \text{ వేగం} = y \text{ km/h}$$

మొత్తం సుంధరం.

$$x+y = 7 \text{ km/h}$$

$$\begin{array}{cc} A & B \\ \text{ధర్మం} & 24 \text{ km} \\ \text{వేగం} & x \text{ km/h} \end{array}$$

$$\text{సాధం} = \frac{24}{x} \quad \frac{24}{y}$$

$$\frac{24}{x} + \frac{24}{y} = 14$$

ఒకపాటు Option సుంధరం క్రమాలు

$$B \text{ Option} \Rightarrow \frac{8}{3} + \frac{6}{4} = 8+6 = 14$$

$$A \text{ సాధం} = (60, 40) = 120$$

$$\text{ధర్మం} = 120 \text{ km}$$

$$\text{సాధం} = 3 \text{ hrs}$$

$$\begin{array}{c} \rightarrow \text{వేగం} = 40 \text{ km/h} \\ P \qquad \qquad \qquad Q \\ \leftarrow \text{వేగం} = 60 \text{ km/h} \end{array}$$

$$\text{సాధం} = 2 \text{ hrs}$$

$$\text{ట్రయిదుగ్గి} = \frac{\text{మొత్తం}}{\text{మొత్తం సాధం}} = \frac{240}{120} = \frac{4}{2} = 48 \text{ km/h}$$

$$d = 200 \text{ km} \quad s = 40 \text{ km/h} \quad t = \frac{d}{s} = 5 \text{ hr}$$

$$d = 200 \text{ km} \quad s = 20 \text{ km/h} \quad t = \frac{d}{s} = 10 \text{ hr}$$

మొత్తం దూరం = 800 km

$$\text{మొత్తం సామాను} = 17 \text{ hr} - 1 \text{ hr} \\ = 16 \text{ hrs}$$

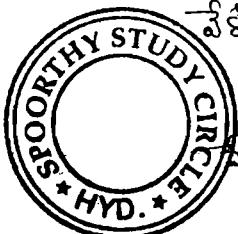
~~$d$~~ 

$$\text{విధిసంఖ్య} = \frac{80}{400 \text{ km}} (5 \times 3, 5 \times 8)$$

$$= \frac{15}{3} \\ = \frac{80}{3} \\ = 26.6666.$$

$$\text{విధిసంఖ్య} = \frac{800}{16} = 50 \text{ km/h}$$

$$\text{వేళ్ళికులు దూరం} = 5x = 5 \times 45 = \frac{225}{4} = 56.25 \text{ km/h}$$

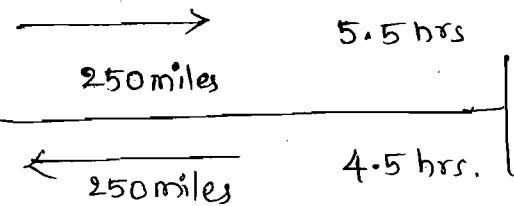


$$\text{వేళ్ళికులు దూరం} \Rightarrow \text{వేళ్ళి} : \text{తీవ్రం} \\ \Rightarrow 125 : 100 \\ \Rightarrow 25\% \uparrow$$

$$\begin{bmatrix} 25 \times 4 \\ 25 \times 5 \end{bmatrix}$$

$$\Rightarrow 5 : 4$$

$$\text{కొసాగు} = [10, L] = 10$$



$$\text{విధిసంఖ్య} = \frac{\text{దూరం}}{\text{వేళ్ళం}} = \frac{50 \text{ miles}}{10 \text{ hrs}} = 50 \text{ miles/hrs.}$$

31)  $\rightarrow$   $v = 3 \text{ km/h}$   $\rightarrow$   $s = 6 \text{ km/h}$   
 $\leftarrow$   $v = 2 \text{ km/h}$   $\leftarrow$   $s = 6 \text{ km/h}$   
 కొలవు = 6 hours

$$\rightarrow \text{ప్రశ్నలు} \quad \text{దూరం} = 10 \text{ km}$$

$$\text{వేగం} = 10 \text{ km/h}, \text{ సామాను} = 1 \text{ hr.}$$

$$\text{ప్రశ్నలు} \quad \text{దూరం} = 10 \text{ km}$$

$$\text{వేగం} = 1 \text{ km/h}$$

$$\text{సామాను} = 10 \text{ hrs.}$$

$$= 7 \text{ AM} - 1 \text{ PM} = 6 \text{ hrs.}$$

$$= 6 \text{ hrs} - 35 \text{ min} (\text{Rest})$$

$$\text{ప్రశ్నలు} \quad \text{సామాను} = 5 \text{ hrs } 25 \text{ min}$$

$$= 5 \text{ hrs } \frac{25}{60} \text{ hrs}$$

$$= \frac{65}{12} \text{ గంభీరం}$$

ప్రశ్నలు

$$11 \text{ hrs} \rightarrow 10 \text{ km}$$

$$\frac{65}{12} \text{ hrs} \rightarrow ?$$

$$\frac{65}{12} \times \frac{10}{11} \text{ hrs}$$

$$= \frac{325}{66} = 4 \frac{61}{66}$$

32)  $\text{దూరం} = 20x$   $\text{సామాను} = 4 \text{ hrs}$   
 $\text{వేగం} \rightarrow 5x$   
 $\leftarrow \text{వేగం} = 4x$   
 $\text{దూరం} = 20x$   
 $\text{సామాను} = 5 \text{ hrs.}$

$$\text{విధిసంఖ్య} = \frac{40x}{9} = 50$$

$$x = \frac{45}{4}$$

34

$$\begin{array}{l} \text{వీగు 50 km/h} \\ \text{అల్ప 1 hr} + 2 \text{hr} + 3 \text{hr} = 6 \end{array}$$

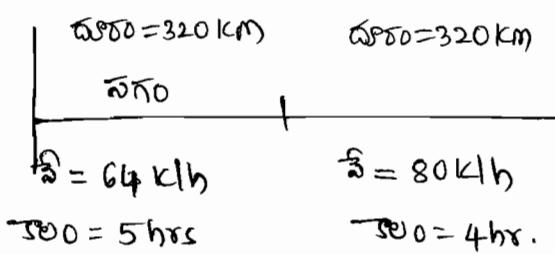
$$\text{యాసం} = \text{వీగు} \times \text{అల్ప}$$

$$50 \text{ km} + 96 \text{ km} + 156 \text{ km} = 302$$

$$\text{వెదురు వీగు} = \frac{\text{యాసం}}{\text{అల్ప}}$$

$$= \frac{302}{6} = \frac{151}{3} \Rightarrow 50 \frac{1}{3}$$

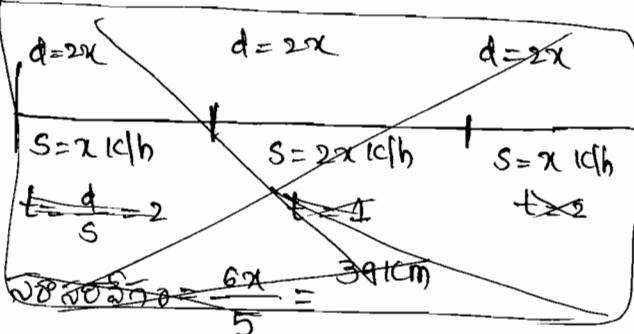
$$35 \quad \text{కొసాగు} = [64, 80] \Rightarrow 320$$



$$\text{వెదురు వీగు} = \frac{640}{9} = 71.11$$

$$39 \quad \text{కొసాగు} [x, 2x, x] = 2x$$

$$\text{అతిధూము} = 2x$$



$$\begin{array}{l} \text{39 cm} \\ \text{v} \\ \text{v} \\ \text{v} \end{array}$$

$$\begin{array}{l} s = x \\ s = 2x \\ s = x \end{array}$$

$$\begin{array}{l} t = 15 \text{ min} = \frac{1}{4} \text{ hr} \\ t = 20 \text{ min} = \frac{1}{3} \text{ hr} \\ t = 10 \text{ min} = \frac{1}{6} \text{ hr} \end{array}$$

$$\begin{array}{l} d = \frac{x}{4} \\ d = \frac{2x}{3} \\ d = \frac{x}{6} \end{array}$$

$$\frac{x}{4} + \frac{2x}{3} + \frac{x}{6} = 39 \text{ cm.}$$

$$\frac{3x + 8x + 2x}{12} = 39$$

$$\frac{10x}{12} = \frac{39}{x}$$

$$x = 36$$

40

$$d = 9 \text{ cm}$$

$$s = 6 \text{ cm}$$

$$t = \frac{d}{s} = \frac{9}{6} = 1.5 \text{ hrs}$$

$$d = 18 \text{ cm}$$

$$s = x \text{ cm}$$

$$t = 1.5 \text{ hrs.}$$

$$t_1 + t_2$$

$$= 1.5 + 1.5$$

$$= 3 \text{ hrs.}$$

$$d = s \times t = 9 \times 3 = 27 \text{ cm.}$$

$$s = \frac{d}{t} = \frac{18 \text{ cm}}{1.5 \text{ hrs}} = \frac{18}{\frac{3}{2}} = 12 \text{ cm/h.}$$

41

$$\text{అల్ప వీగు} s = x$$

$$s = \frac{d}{t}$$

$$\frac{5}{7}x = \frac{42 \text{ cm}}{\frac{42}{25}}$$

$$\frac{5x}{7} = \frac{5}{25}$$

$$x = 35 \text{ cm/h.}$$

$$1 \text{ గో. } 40 \text{ ని. } 48 \text{ సి.}$$

$$1 \text{ గో. } 40 \text{ ని. } \frac{48}{4}$$

$$1 \text{ గో. } \frac{204}{5} \times \frac{1}{60}$$

$$= 1. \frac{17}{25} \text{ గో.}$$

$$= \frac{42}{25}$$

42

$$\begin{array}{l} s_1 = x \\ t_1 = t \\ s_2 = \frac{11}{7}x \\ t_2 = \frac{11}{7}t \end{array}$$

$$t_2 = 22 \text{ hrs.}$$

$$\frac{11}{7}t = 22 \text{ hrs.}$$

$$t = 14 \text{ hrs.}$$

22 hrs

So, 8 గోలు ఉంచుటచే దిశ.

43

$$s = \frac{d}{t} \quad (t = \frac{1}{4} \text{ hr})$$

$$s \propto d$$

$$\frac{s_1}{s_2} = \frac{d_1}{d_2}$$

$$15 \times \frac{1}{13} = x \text{ తర్వాతి}$$

$$s_1 = 15x$$

$$d_1 = d$$

$$s_2 = 14x$$

$$d_2 = d - 10$$

$$\frac{15x}{14x} = \frac{d}{d-10}$$

$$15d - 150 = 14d$$

$$d = 150$$

$$S = \frac{d}{t} = \frac{150}{30} = 5 \text{ km/h.}$$

4)

$$\begin{aligned} S_1 &= s \\ t_1 &= t \\ S_2 &= \frac{6}{7}s \\ t_2 &= \frac{7}{6}t \end{aligned}$$

12 నిల్లా శిలస్వరూప.

$$t_2 - t_1 = 12 \text{ నిల్లాయా}$$

$$\frac{7}{6}t - t = 12$$

$$\frac{7t - 6t}{6} = 12$$

$$\frac{t}{6} = 12$$

$$t = 72 \text{ min.} \Rightarrow 1 \text{ గం} 12 \text{ నిల్లాయా.}$$

5)

$$\begin{aligned} 1^{\text{st}} &= 2.5 \text{ km/h} & 6 \text{ నిల్లా శిలస్వరూప} & \text{తేడు } 12 \text{ నిల్లా } \\ 2^{\text{nd}} &= 3.5 \text{ km/h} & 6 \text{ నిల్లా తొందరగా } & \leftarrow \end{aligned}$$

$$\text{వీగలకసాగు} = [2.5, 3.5] = 2.5 \times 3.5$$

$$20 \text{ టసంటి లోర్డు} = 2.5 \times 3.5 \text{ పిస్టినువు.}$$

$$\begin{aligned} 1^{\text{st}} & \text{చూరు} & \text{వీగ} & \text{కాలు} = \text{చూ/వీ} \\ & \frac{2.5 \times 3.5}{2.5 \text{ km/h}} & - 3.5 \text{ hrs} & \leftarrow \text{తేడు} \\ 2^{\text{nd}} & \text{చూరు} & 3.5 \text{ km/h} & \left( 1 \text{ hr} \right) \\ & \frac{2.5 \times 3.5}{3.5 \text{ km/h}} & - 2.5 \text{ hrs} & \left( \frac{60 \text{ min}}{60 \text{ min}} \right) \end{aligned}$$

$$\text{తేడు} \quad \text{చూరు}$$

$$60 \text{ min} \rightarrow 2.5 \times 3.5$$

$$12 \text{ ని} \rightarrow ?$$

$$\frac{12 \times 3.5 \times 3.5}{60} = 1.75 \text{ km.}$$

$$(46) \quad \text{కసాగు} = 5 \left| \frac{40,35}{8,7} \right| = 280$$

$$40 \text{ km} \quad 0 \text{ ని} \quad \text{శిలస్వరూప/తొందరగా} \quad \text{తేడు } 15 \text{ గా}$$

$$35 \text{ km} \quad 15 \text{ ని} \quad \text{శిలస్వరూప}$$

$$1^{\text{st}} \quad \frac{\text{చూరు}}{280 \text{ km}} \quad \frac{\text{వీగ}}{40 \text{ km/h}} \quad \frac{\text{కాలు}}{7 \text{ hrs}}$$

$$2^{\text{nd}} \quad \frac{280 \text{ km}}{35 \text{ km/h}} \quad 8 \text{ hrs} \quad \left( \frac{60 \text{ min}}{60 \text{ min}} \right)$$

$$60 \text{ min} \rightarrow 280 \text{ km}$$

$$15 \text{ min} \rightarrow ?$$

$$\frac{15 \times 280}{60} = 70 \text{ km}$$

$$(47) \quad S_1 = 10 \text{ km/h} \rightarrow 2 \text{ pm} \quad \text{తేడు } 2 \text{ hrs.}$$

$$S_2 = 15 \text{ km/h} \rightarrow 12 \text{ pm}$$

$$S_3 = ? \rightarrow 1 \text{ pm}$$

$$\text{వీగలకసాగు} = [10, 15] = 30$$

$$\text{చూరు} = 30 \text{ km} \text{ పిస్టిను}$$

$$① \text{కాలు} = \frac{30 \text{ km}}{10 \text{ km/h}} = 3 \text{ hrs} \quad \text{తేడు } 1 \text{ hr}$$

$$② \text{కాలు} = \frac{30 \text{ km}}{15 \text{ km/h}} = 2 \text{ hrs} \quad \text{వస్తుంది. తెల్పు}$$

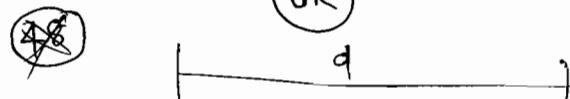
$$\text{చూరు} = 60 \text{ km} \text{ పిస్టిను}$$

$$① \text{కాలు} = \frac{60 \text{ km}}{10 \text{ km/h}} = 6 \text{ hrs} \quad \begin{matrix} 2 \text{ pm} \\ 8 \text{ AM} \end{matrix} \quad \text{తేడు } 2 \text{ hrs}$$

$$② \text{కాలు} = \frac{60 \text{ km}}{15 \text{ km/h}} = 4 \text{ hrs} \quad \begin{matrix} \text{వస్తుంది.} \\ 12 \text{ pm} \end{matrix} \quad \begin{matrix} 8 \text{ AM} \end{matrix}$$

$$③ \text{వీగ} = \frac{\text{చూరు}}{\text{కాలు}} = \frac{60 \text{ km}}{4 \text{ hrs}} = \frac{15 \text{ km}}{1 \text{ hr}} = 15 \text{ km/h.} \quad \begin{matrix} 1 \text{ pm} \\ 8 \text{ AM} \end{matrix} \quad \begin{matrix} 5 \text{ hrs} \end{matrix}$$

OR



$$\frac{d}{10} - \frac{d}{15} = 2 \text{ hrs}$$

$$\frac{d}{30} = 2$$

$$d = 60 \text{ km}$$

$$\frac{d}{x} - \frac{d}{15} = 1$$

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

$$\frac{60}{x} = 8$$

$$x = 12 \text{ km/h.}$$

48) 1<sup>st</sup> 40 km —  $\text{11 నిలియ్యం}$  తేడా  
2<sup>nd</sup> 50 km —  $\text{5 నిలియ్యం} \leftarrow$  6ప॥

$$\begin{aligned} (10t - x = 10) \times 2 \\ 20t - \frac{7x}{4} = 35 \\ \underline{\quad + \quad - \quad} \\ -2x + \frac{7x}{4} = 20 - 35 \\ \frac{-8x + 7x}{4} = -15 \\ \cancel{x} = \cancel{-15} \\ x = 60 \end{aligned}$$

Sol: వెగురసాగు =  $\frac{40+50}{2} = 200$

ఒంటనండ్రిఫీస్ దూరం = 200 km ప్రసారి॥

1 <sup>st</sup>	$\frac{\text{దూరం}}{200 \text{ km}}$	$\frac{\text{వీధి}}{40 \text{ km/h}}$	$\frac{5\text{hr}}{1\text{hr}}$
2 <sup>nd</sup>	$\frac{\text{దూరం}}{200 \text{ km}}$	$\frac{\text{వీధి}}{50 \text{ km/h}}$	$\frac{4\text{hr}}{(60\text{min})}$

$$\begin{array}{ccc} 60\text{min} & \longrightarrow & 200 \\ 6\text{min} & \longrightarrow & ? \end{array} \Rightarrow \frac{6 \times 200}{80} \Rightarrow 20 \text{ km}$$

1<sup>st</sup> Case:

$s = 40 \text{ km/h}, d = 20 \text{ km}, \dots \text{11 నిలియ్యం}$

$t = \frac{d}{s} = \frac{20}{40} = \frac{1}{2} \text{ hr} = 30 \text{ min}$

అసంబంధిత సమయం =  $30 \text{ min} - 11 \text{ min}$   
 $= 19 \text{ min.}$

### 49) Imp Question For Exam

~~$\frac{x}{2} + 3$~~   $\rightarrow \frac{-2}{3} = 2$

~~$x - 2$~~   $\rightarrow + \frac{2}{3} = \frac{4}{3}$

$$\begin{array}{c} + \\ 3t - \frac{2x}{3} = 2 \\ -2t + \frac{2x}{3} = \frac{4}{3} \\ \hline t = 2 + \frac{4}{3} \end{array}$$

$t = \frac{10}{3}$

$$\begin{aligned} \text{దూరం} &= \frac{\text{వీధి}}{2} \times \text{సామాను} \\ &= \frac{1}{2} \times \frac{10}{3} \\ &= 40 \text{ km.} \end{aligned}$$

### 50)

~~$x + 10$~~   $\rightarrow -1$

~~$x + 20$~~   $\rightarrow - \frac{7}{4} = 35$

అంతిమ దూరం నేరుగా.

### 51) ప్రయాణిస్తున్న కొత్త వ్యాపారాలు

$$\frac{75 \text{ km}}{3x \text{ km/h}} + \frac{12.5}{60} \text{ hr} = \frac{75 \text{ km}}{2x \text{ km/h}}$$

$$\begin{aligned} \frac{75}{x} \left( \frac{1}{3} - \frac{1}{2} \right) &= \frac{-125}{600} \\ \frac{25}{x} \left( \frac{+1}{6} \right) &= \frac{+125}{600} \\ x &= 60 \end{aligned}$$

$$\text{దూరం} = 75 \text{ km}$$

$\frac{75}{2x \text{ km/h}} \times 50\% \uparrow$

$$\begin{aligned} 75 &= \frac{d}{s} \\ 75 &= \frac{120}{2x} \\ 120 &= 2x \\ x &= 60 \end{aligned}$$

$\text{ప్రయాణిస్తున్న దూరం} = 120 \text{ km.}$

### 52)

With stoppages —

54 km/h —

without stoppages

45 km/h.

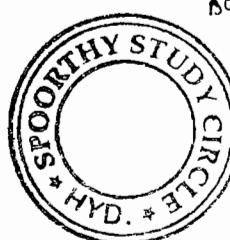
కంటు. 54 km —

45 km = loss ~~9~~ 9 km

$$t = \frac{d}{s} = \frac{9 \text{ km}}{\frac{54}{6} \text{ km/h}} = \frac{1}{6} \text{ hours.}$$

$$= \frac{1}{6} \times \frac{10}{60}$$

= 10 రఘువురు తుంది.



$$53) t = \frac{d}{s}$$

మెదడవేగం  
 $x \text{ km/h}$

రోడ్ వేగం  
 $(x+10) \text{ km/h}$

$$t_1 - t_2 = 2 \text{ hrs.}$$

$$\frac{715}{x} - \frac{715}{x+10} = 2 \text{ hrs.}$$

$$715 \left( \frac{x+10 - x}{x(x+10)} \right) = 2 \text{ hrs}$$

$$x(x+10) = 715 \times 5$$

$$= 715 \times 5 \times 5$$

$$x(x+10) = 55 \times 65$$

[ ఇట్లు గాలింపబడుని  
లింగం ఓపించిని  
తీసుకొనుచుండి ]

$$x(55+10) = 55 \times 65$$

$$x(65) = 55 \times 65$$

$$x = 55$$

$$54) S_1 : S_2 = 3 : 4 \quad (\text{ధృవ్యాప విల్హమసాగు})$$

$$t_1 : t_2 = 4 : 3$$

$\underset{30 \text{ రోడ్}}{\text{ఎక్షిస్}}$

$$1 \rightarrow 30 \text{ రోడ్}$$

$$4 \rightarrow ? = \frac{4 \times 30}{1} = 120 \text{ min.}$$

55)

Abhai  
 $x \text{ km/h}$

Sanjay  
 $y \text{ km/h}$

$$A \text{ తాథు } - S \text{ తాథు } = 2 \text{ hrs}$$

$$S_1 = \frac{30}{x} - \frac{30}{y} = 2$$

$$S_2 = \frac{30}{y} - \frac{30}{2x} = 1$$

$$+ \frac{30}{x} - \frac{30}{y} = 2$$

$$\frac{30}{y} - \frac{30}{2x} = 1$$

$$\frac{10}{2x} = 1$$

$$x = 5$$

$$56) S_1 : S_2 : S_3 = 4 : 3 : 5$$

$$\boxed{S \propto \frac{1}{E}}$$

$$\text{కసాగు } \underline{[4, 3, 5]} = 60' \text{-స్టేటిస్టిక్స్}$$

$$= \frac{4}{15} : \frac{3}{20} : \frac{5}{12} = \frac{1}{15} : \frac{1}{20} : \frac{1}{12}$$

$$t_1 : t_2 : t_3 = 15 : 20 : 12$$

$$57) \begin{array}{l|l} S_1 = x & S_2 = x+4 \\ t_1 = 8 & t_2 = \frac{15}{2} \end{array}$$

$$\text{చూర్ణించి } S = \frac{*}{t}$$

$$\frac{S_1}{S_2} = \frac{t_2}{t_1}$$

$$\frac{x}{x+4} = \frac{15}{8}$$

$$\frac{x}{x+4} = \frac{15}{16}$$

$$15x = 15x + 60$$

$$x = 60$$

$$\text{కుండా } d = s \times t = 60 \times 8 = 480 \text{ km.}$$

$$58) \text{ కసాగు } = 3 \times 3.75$$

$$\text{చూర్ణించి } S = 3 \times 3.75 \text{ అస్ట్రోస్టా.$$

$$\begin{array}{l} S_1 = 3 \quad t_1 = 3.75 \text{ hrs} \\ S_2 = 3.75 \quad t_2 = 3 \text{ hrs} \end{array} \Rightarrow \begin{array}{l} \text{తేడె} = 0.75 \text{ hrs} \\ = \frac{3}{4} \times \frac{15}{60} \end{array}$$

$$\text{తేడె } \frac{S_1}{S_2} = \frac{t_1}{t_2} \Rightarrow \frac{3}{3.75} = \frac{45}{3}$$

$$45 \rightarrow 3 \times 3.75 \Rightarrow 30 \rightarrow ? \Rightarrow \frac{30 \times 3 \times 3.75}{45} = 3$$

$$\Rightarrow 2 \times 3.75 = 7.5$$

$$\text{అంగుటాలి అస్టా } t = ? \text{ రోడ్ } S = \frac{d}{t}$$

$$\frac{S_1}{S_2} = \frac{d_1}{d_2}$$

$$\frac{5}{7} \frac{10}{14} \times \frac{x}{x+20}$$

$$7x = 5x + 100$$

$$2x = 100$$

$$x = 50$$

$$60) S_1 - S_2 = 200 \text{ km/h}$$

$$\frac{d_1}{t_1} - \frac{d_2}{t_2} = 200 \text{ km/h}$$

$$\frac{600 \text{ km}}{t} - \frac{600 \text{ km}}{t + \frac{1}{2}} = 200$$

ఇటుకు నుండి Go యాండర్స్, Options A లేదా B లేదా C

$$\frac{600}{1} - \frac{600}{1 + \frac{1}{2}} = 200$$

$$\frac{600}{1} - \frac{600 \times 2}{3} = 200$$

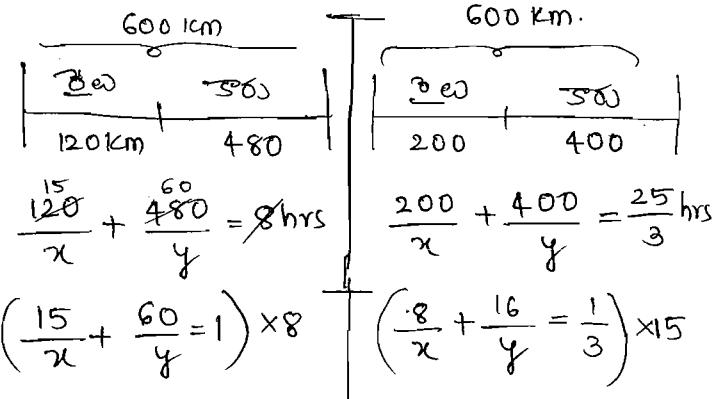
$$600 - 400 = 200$$

$$200 = 200$$

$$\text{Ans : 1}$$

$$61) \overline{S_1} = x \text{ km/h.}$$

$$\overline{S_2} = y \text{ km/h.}$$



$$\frac{120}{x} + \frac{480}{y} = 8$$

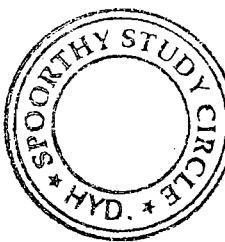
$$\frac{120}{x} + \frac{240}{y} = 5$$

$$\frac{240}{y} = 3$$

$$y = 80$$

$$x:y = \frac{60}{3} : \frac{80}{4}$$

$$x:y = 3:4.$$



$$62) \begin{array}{l} \text{వీగాలు A:B = 2:1} \\ \text{వీగాలు B:C = 3:1} \end{array}$$

$$\text{తొక్కలనిష్పత్తి A:B:C = 6:3:1.}$$

$$\text{కొలాలనిష్పత్తి A:B:C = } \frac{6}{6} : \frac{3}{6} : \frac{1}{6}$$

(కొన్ని 6 తో బహించాల)

$$\text{కొఱలనిష్పత్తి} = 1:2:6$$

?                          ?  
                            18        54

63)

$$\text{కెమ్ము/ఎట్టు పట్టునమయి} = \frac{\text{ఒచ్చుచుట్టుచూసు}}{\text{సాధ్య వీగా}}$$

$$\frac{x}{5.5} \rightarrow \frac{x}{5} = \frac{8.5 \text{ km}}{0.5 \text{ km/h}}$$

$$x = 5.5 - 5 = 0.5 \text{ km/h}$$

$$= 17 \text{ hrs.}$$

64)

$$A \text{ వీగా} = \frac{1 \text{ round}}{1 \text{ hr.}} \quad | \quad B \text{ వీగా} = \frac{6 \text{ rounds}}{1 \text{ hr.}}$$

$$= 1 \quad \quad \quad = 6$$

$$\text{ఒకిసలచినిష్పత్తి వీగా} = 6-1 = 5 \text{ round/hour.}$$

5 rounds  $\rightarrow$  1 hr

$$1 \text{ round} \rightarrow ? = \frac{1 \times 1}{5} \Rightarrow \frac{1}{5} \text{ hrs.}$$

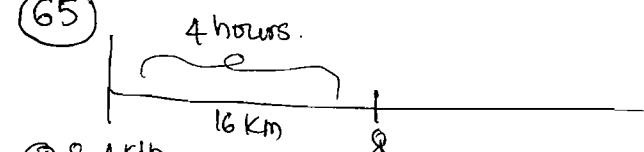
$$= \frac{1}{5} \times 60 \text{ min}$$

$$= 12 \text{ min}$$

$$\Rightarrow 7:30 + 12 \text{ min}$$

$$= 7:42$$

65)

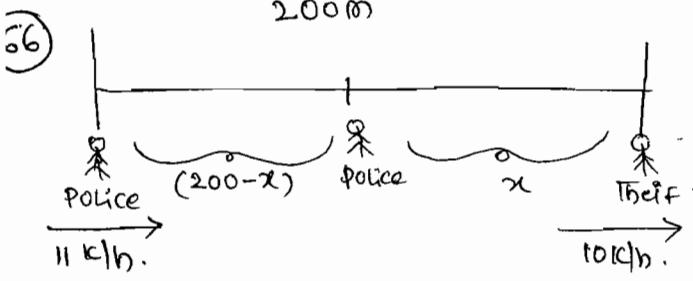


$$\text{ఒకిసలచినిష్పత్తి} = 10-4 = 6 \text{ km/h.}$$

$$A \text{ వీగా } d = S \times t \Rightarrow 4 \times 4 \Rightarrow 16 \text{ km.}$$

$$\text{కొఱలనిష్పత్తి} = \frac{\text{ఒ.వీ}}{\text{సా.వీ}} = \frac{16 \text{ km}}{6 \text{ km/h}} = \frac{8}{3} \text{ hrs.}$$

$$\text{ఒకిసలచినిష్పత్తి} = 10 \times \frac{8}{3} \Rightarrow \frac{80}{3} \Rightarrow 26.666$$



$$\text{సమయం} = \frac{\text{ఇచ్ఛిత రూపం దూరం}}{\text{సాధ్య వీటి}}.$$

$$60 \times 60 \text{ sec} = \frac{(200-x) \text{ m}}{1 \times \frac{5}{18} \text{ m/s}}$$

$$\frac{2}{3} \cdot 360 \text{ sec} = \frac{(200-x)}{18} \text{ m}$$

$$100 = 200 - x$$

$$x = 100$$

67  $2:30 \text{ pm} - 3 \text{ pm} = \frac{1}{2} \text{ hr.}$

$$\text{శాంతి} - d = s \times t = 60 \text{ km/hr} \times \frac{1}{2} \text{ hr} = 30 \text{ km}$$

$$\text{కి/హ. పెట్టిన సమయం} = \frac{\text{శాంతి}}{\text{సాధ్య}}.$$

	$= \frac{30 \text{ km}}{15 \text{ km/h}}$ $= 2 \text{ hrs.}$ $= 3 \text{ pm} + 2 \text{ hrs}$ $= 5 \text{ pm.}$
--	--

58 శాంతి 9:00 →

శాంతి 9:10:30

$$\text{Train } x \text{ km/h.}$$

10:11

$$10 \text{ నిమిషాలలు త్రిపు క్రమాగాణిన దూరం} = 30 \text{ సంస్కరణ లోఫ్టు} \quad \text{కి/హ. పెట్టిన సమయం} = \frac{\text{శాంతి దూరం}}{\text{సాధ్య వీటి}} = \frac{726 \text{ m}}{33 \times 5 \text{ m/s}}$$

$$x \times \frac{5}{18} \text{ m/s} \times 10 \times 60 \text{ sec} = 33 \text{ m/s} \times 30 \text{ sec}$$

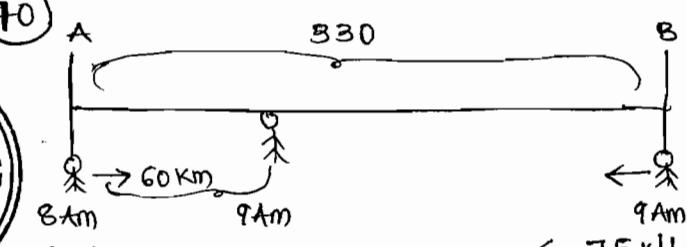
$$x = \frac{33 \times 3 \times 3}{5} = \frac{297}{5} = 59.4 \text{ km/h.}$$

69  $20 \text{ km/h.} \quad 18 \text{ km/h.}$

$$\text{సాధ్య వీటి} = 20 + 18 = 38.$$

$$\begin{aligned} \text{సమయం} &= \frac{\text{ఇచ్ఛిత వ్యవహరణ}}{\text{సాధ్య వీటి}} \\ &= \frac{47.5 \text{ km}}{38 \text{ km}} = \frac{475}{380} \left( \frac{19 \times 20}{19 \times 25} \right) \\ &\Rightarrow \frac{5}{4} \Rightarrow 1 \frac{1}{4} \end{aligned}$$

70



$$\begin{aligned} \text{దూరం } d &= s \times t \\ &= 60 \times 1 \\ &= 60 \text{ km} \end{aligned}$$

$$\begin{aligned} \text{ప్రతి అడవి సాధ్య వీటి} &= 60 + 75 \\ &= 135 \text{ km/h.} \end{aligned}$$

$$\text{కి/హ. పెట్టిన సమయం} = \frac{\text{శాంతి}}{\text{సాధ్య}} = \frac{270 \text{ km}}{135 \text{ km/h}}$$

$$\begin{aligned} &= 2 \text{ hrs.} \\ &= 9 \text{ Am} + 2 \text{ hrs} \\ &= 11 \text{ Am.} \end{aligned}$$

71

$$\text{సాధ్య వీటి ప్రతి దిశలలి} = \frac{4.5}{+ 3.75}$$

భిన్నాలను సంఖ్యలలో ప్రచురించాలి

$$= 8.25$$

$$= 8 \frac{1}{4}$$

$$= 3 \frac{3}{4} \text{ km/h.}$$

$$\begin{aligned} \text{కి/హ. పెట్టిన సమయం} &= \frac{726 \text{ m}}{33 \times 5 \text{ m/s}} \\ &= \frac{726 \times 4 \times 18}{33 \times 5} \times \frac{1}{60} \text{ నిమిషాలు} \\ &= \frac{22 \times 4 \times 3}{5 \times 10} \times 2 \text{ నిమిషాలు} \\ &= \frac{528}{100} = 5.28 \text{ min} \end{aligned}$$

72

$$A \text{ వేగం } = 2 \text{ rounds/hr}, \rightarrow$$

$$B \text{ వేగం } = 3 \text{ rounds/hr.} \leftarrow$$

$$\text{సా.వేగం } = 3+2 = 5 \text{ round/1 hr}$$

(క్రొత్తిఖండ).

$$5 \text{ rounds} \rightarrow 1 \text{ hr}$$

$$1 \text{ round} \rightarrow \frac{1 \times 1}{5} = \frac{1}{5} \text{ hrs}$$

$$= \frac{1}{5} \times 60 \text{ min}$$

$$= 12 \text{ min. (ప్రాయః)}$$

8:00 - 9:30 AM

$$\text{మొత్తం } = 90 \text{ min.}$$

$$= \frac{90}{120} \text{ hrs} \Rightarrow 7 \text{ సాయంత్రికం}$$

73



వ్యతిశీలించుటకి

$$\text{క్ర/ప. సమయం } = \frac{\text{దూరం}}{\text{సా.వే}}$$

$$1 = \frac{120}{x+y}$$

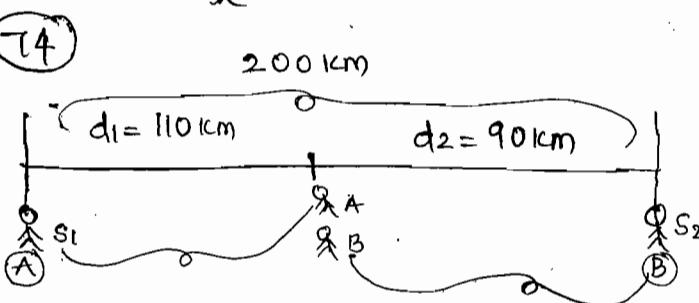
$$x+y = 120$$

$$+ \begin{cases} x+y = 120 \\ x-y = 120 \end{cases}$$

$$2x = 140$$

$$x = 70$$

200 km



A త్వరణం = B త్వరణం.

$$S = \frac{d}{t}$$

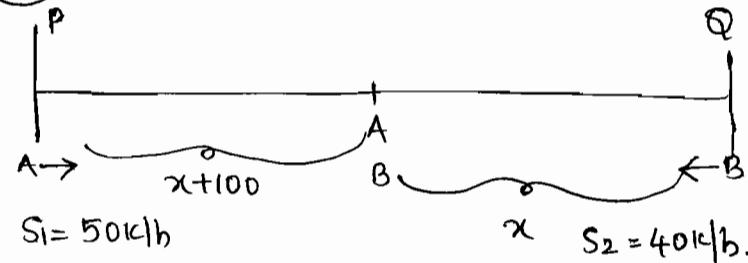
$$సా.వేt = \text{సా.వే}$$

$$S < d.$$

$$\frac{S_1}{S_2} = \frac{d_1}{d_2}$$

$$\frac{S_1}{S_2} = \frac{110}{90}$$

75



$$\text{ఇటిక్కెళ్లం స్థితి: } S = \frac{d}{t}$$

$$\frac{S_1}{S_2} = \frac{d_1}{d_2}$$

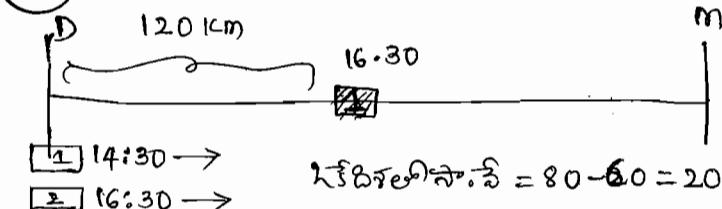
$$\frac{50}{40} = \frac{x+100}{x}$$

$$+x+400 = 5x$$

$$x = 400$$

$$\begin{aligned} \text{మొత్తం దూరం} &= x+100+x \\ &= 400+100+400 \\ &= 900 \end{aligned}$$

76



$$\text{హేడ్జింగ్ సా.వే } = 80 - 60 = 20$$

$$\begin{aligned} 14:30 - 16:30 \text{ Mumbai express దూరం} &= S \times t \\ &= 60 \times 2 \\ &= 120 \text{ km.} \end{aligned}$$

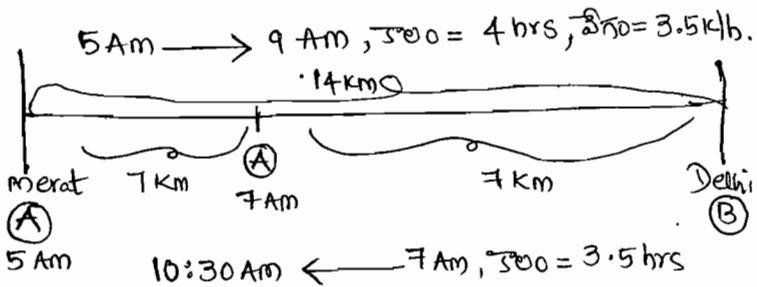
$$\text{క్ర/ప. ప్రాయః సమయం } = \frac{\text{దూరం}}{\text{సా.వే}}$$

$$= \frac{120 \text{ km}}{20 \text{ km/h}} \Rightarrow 6 \text{ hrs.}$$

$$\begin{aligned} \text{Delhi నుండి దూరం } d &= S \times t \rightarrow \text{ఒకసాయంత్రిక వాతావరింగ్} \\ &= (80 \text{ km/h}) \times 6 \\ &= 480 \text{ km.} \end{aligned}$$

77

$$S \propto \frac{1}{t} \text{ సాత్రు 0 ల్లంగా...}$$



$$\text{మధ్యరహితమైన దూరం = } [3.5, 4] \text{ రసాయనం}$$

$$= 3.5 \times 4 = 14 \text{ km.}$$

$$\begin{aligned} \text{విగ్రహం} &= S \times t \\ &= 3.5 \times 2 \text{ hrs} \\ &= 7 \text{ km} \\ \text{సాధారణ విగ్రహం} &= 4 + 3.5 \\ &= 7.5 \text{ km/h.} \end{aligned}$$

$$\begin{aligned} \text{క.ప. సమయం} &= \frac{7.5 \text{ కు}}{\text{సాధారణ}} \\ &= \frac{7 \text{ km}}{7.5 \text{ km/h}} \\ &= \frac{70}{75} \text{ hrs.} \\ &= \frac{14}{70} \times 60 \text{ min} \\ &= \frac{4}{5} \text{ min.} \\ &= 14 \times 4 \Rightarrow 56 \text{ min.} \end{aligned}$$

$$\text{So, } 7 \text{ hrs} + 56 \text{ min} \Rightarrow 7:56$$

18

$$\text{Walking + Riding} = 5 \text{ గం. } 45 \text{ ను } 11$$

$$\text{Riding + Walking} = 3 \text{ గం. } 45 \text{ పు } 11$$

$$\omega + \omega \rightarrow ?$$

$$\omega + R = 5 \text{ గం } 45 \text{ పు }$$

$$2\omega + 2R = 10 \text{ గం } 90 \text{ పు }$$

$$2R = 3 \text{ గం } 45 \text{ పు }$$

$$(-) \quad (-)$$

$$2\omega = 7 \text{ గం } 45 \text{ పు }$$

## \* TRAINS \*

① లను  
ప్రయాసం / వ్యాపారం / బిల్డింగ్ లను  
దాటచేసే విధి సమయం  $t = \frac{l}{R.S. (\text{సాధారణ})}$

② లను  
ప్రయాసం / Bridge platform

$$\text{దాటచేసే విధి సమయం } t = \frac{l+b}{s}$$

③ లను  
దాటచేసే విధి సమయం  $t = \frac{l_1 + l_2}{R.S.}$

R.S. Agarwal Book

①  $\Rightarrow 108 \text{ km/h}$   $\Rightarrow$   
 $= 108 \times \frac{5}{18} \text{ m/s}$   
 $= 30 \text{ m/s.}$

②  $\Rightarrow 14 \text{ m/s}$   
 $= 14 \times \frac{3.6}{5} \text{ km/h}$   
 $= 50.4 \text{ km/h.}$



③  $t = \frac{l}{s}$   
 $= \frac{205}{100 \text{ m}}$   
 $= \frac{8/2 \times 5/1 \text{ m}}{18/1 \text{ s}}$   
 $= \frac{5}{2} \Rightarrow 2.5 \text{ sec.}$

④  $t = \frac{l}{s}$   
 $(7 \times 9) = \frac{280 \text{ m}}{40/8}$   
 $= \frac{63 \times 5/1 \text{ m}}{18/2 \text{ s}}$   
 $= 8 \times 2$   
 $= 16 \text{ sec}$

$$\textcircled{5} \quad t = \frac{l+b}{s}$$

$$= \frac{110+132}{472 \times \frac{5}{18}}$$

$$= \frac{242}{20} \cancel{10}$$

$$= \frac{121}{10} \Rightarrow 12.1 \text{ sec}$$

$$\textcircled{6} \quad t = \frac{l+b}{s}$$

$$= \frac{360+140}{45 \times \frac{5}{18}}$$

$$= \frac{500 \times 2}{25} \Rightarrow 40 \text{ sec}$$

$$\textcircled{7} \quad t = \frac{l+b}{s} = \frac{\frac{1}{2} + \frac{1}{4} \text{ miles}}{75 \text{ m/sec}}$$

$$= \frac{15}{4 \times 75} \text{ hrs}$$

$$= \frac{15}{4 \times 75} \times 60 \text{ min}$$

$$= 3 \text{ min.}$$

$$\textcircled{8} \quad t = \frac{l}{s}$$

$$9 \text{ sec} = \frac{l}{60 \times \frac{5}{18}}$$

$$l = \frac{18 \times l}{60 \times 5}$$

$$l = 150$$

$$\textcircled{9} \quad t = \frac{l}{s}$$

$$6 \text{ sec} = \frac{132 \text{ m}}{s}$$

$$s = \frac{132 \text{ m}}{6} \Rightarrow s = 22 \text{ m/sec.}$$



$$s = 22 \times \frac{18^6}{5} \text{ km/h.}$$

$$s = 22 \times 3.6 \text{ km/h.}$$

$$s = 79.2 \text{ km/h.}$$

$$\textcircled{10} \quad \text{Distance} = \frac{1200}{10} = \frac{120 \text{ cm}}{10 \text{ sec}} = \frac{1200 \text{ cm}}{10 \times 60 \text{ sec}} = 20 \text{ m/s}$$

$$t = \frac{l}{s}$$

$$l = \cancel{1} \times \frac{l}{20}$$

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

$$\textcircled{11} \quad t = \frac{l}{s}$$

$$240 = \frac{240}{s}$$

$$s = 10$$

$$t = \frac{240+650}{10}$$

$$t = \frac{890}{10}$$

$$t = 89 \text{ sec}$$

(OR)

$$240 \text{ m} \rightarrow 24 \text{ sec}$$

$$240+650 = 890 \text{ m} \rightarrow ? \quad 89 \text{ sec}$$

$$\textcircled{12} \quad t = \frac{l+b}{s}$$

$$30 \text{ sec} = \frac{130+b}{60 \times \frac{5}{18}}$$

$$30 = \cancel{2} \times (130+b)$$

$$375 = 130+b$$

$$b = 375 - 130$$

$$b = 245 \text{ m}$$

$$\textcircled{13} \quad t = \frac{l+b}{s}$$

$$60 \text{ sec} = \frac{800+b}{78 \times \frac{5}{18}}$$

$$6 \times 3 = 18$$

$$13 \times 6 = 78$$

$$\frac{20}{60} = \frac{l+b}{s}$$

$$1300 = 800 + b$$

$$b = 1300 - 800$$

$$b = 500$$

$$4) t = \frac{l+b}{s}$$

$$26 \text{ sec} = \frac{l+250}{s} \text{ m}$$

$$\frac{72 \times 5}{4} \frac{1}{18_1}$$

$$26 \text{ sec} = \frac{l+250}{20}$$

$$520 = l+250$$

$$l = 520 - 250$$

$$l = 270$$

$$5) l = b$$

$$t = \frac{l+b}{s}$$

$$60 \text{ sec} = \frac{l+l}{s}$$

$$\frac{90 \times 5}{5} \frac{1}{18_1} \text{ m/s}$$

$$60 = \frac{2l}{25}$$

$$l = 750$$

$$6) \text{ Speed} = x \text{ km/h.}$$

$$t = \frac{l+b}{s}$$

$$\frac{81}{2} \text{ sec} = \frac{150+b}{x \times \frac{5}{18}}$$

$$\frac{x \cdot 81}{2} \cancel{\times} \frac{50}{450} \frac{2}{18} x$$

$$x = 40 \text{ km/h.}$$

$$17) t = \frac{l+b}{s}$$

$$60 = \frac{l+100}{\frac{54 \times 5}{18_2}}$$

$$60 = \frac{2(l+100)}{25}$$

$$750 = l+100$$

$$l = 650$$

$$t = \frac{l}{s}$$

$$= \frac{650}{\frac{54 \times 5}{18_2}}$$

$$= 52 \text{ sec}$$

18)

$$t = \frac{l+b}{s}$$

$$36 = \frac{l+b}{s}$$

$$36 = \frac{300+b}{\frac{54 \times 5}{3} \frac{1}{18_1}}$$

$$540 = 300+b$$

$$b = 240$$

$$t = \frac{l}{s}$$

$$20 = \frac{l}{\frac{54 \times 5}{3} \frac{1}{18_1}}$$

$$20 = \frac{l}{15}$$

$$l = 300$$

19)

$$t = \frac{l+b}{s}$$

$$39 = \frac{300+b}{\frac{50}{3}}$$

$$39 = \frac{3(300+b)}{50}$$

$$650 = 300+b$$

$$b = 350$$

$$t = \frac{l}{s}$$

$$18 = \frac{300}{s}$$

$$s = \frac{300}{18}$$

$$s = \frac{50}{3} \text{ m/s}$$

$$(20) \quad t = \frac{l}{s}$$

$$15 = \frac{l}{s}$$

$$s = \frac{l}{15}$$

$$t = \frac{l+b}{s}$$

$$25 = \frac{l+100}{s}$$

$$s = \frac{l+100}{25}$$

$$\frac{l}{15} \times \cancel{\frac{l+100}{25}}$$

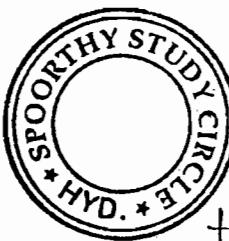
$$5l = 3l + 300$$

$$\uparrow (-)$$

$$2l = 300$$

$$l = 150$$

$$\left( \frac{300}{2} \right)$$



$$\cancel{\frac{l+162}{18}} \times \cancel{\frac{l+120}{5}}$$

$$5l + 810 = 6l + 720$$

$$l = 810 - 720$$

$$l = 90 \text{ m.}$$

(23)

$$t = \frac{l}{R.S (\text{सां.वी})}$$

$$= \frac{50 \text{ m}}{60 \times \frac{5}{18} \text{ s}}$$

$$= 10 \times 3$$

$$t = 30 \text{ sec}$$

(निक्षिप्त समय)  
सां.वी =  $63 - 3 = 60 \text{ K/h.}$

$$(21) \quad t = \frac{l+b}{s}$$

$$20 = \frac{l+264}{s}$$

$$s = \frac{l+264}{20} \rightarrow ①$$

$$t = \frac{l}{s}$$

$$8 = \frac{l}{s}$$

$$s = \frac{l}{8} \rightarrow ②$$

$$\cancel{\frac{l+264}{20}} \times \cancel{\frac{l}{8}}$$

$$2l + 528 = 5l$$

$$3l = 528$$

$$l = 176$$

$$s = \frac{l}{8}$$

$$= \frac{176}{8} \Rightarrow 22 \text{ m/s.}$$

$$= 22 \times \frac{18}{5} \text{ K/h.} \Rightarrow 22 \times 3.6 \text{ K/h.}$$

$$\Rightarrow 79.2 \text{ km/h.}$$

(22)

$$t = \frac{l+b_1}{s}$$

$$18 = \frac{l+162}{s}$$

$$s = \frac{l+162}{18}$$

$$t = \frac{l+b_2}{s}$$

$$15 = \frac{l+120}{s}$$

$$s = \frac{l+120}{15}$$

(24)

$$t = \frac{l+b}{R.S (\text{सां.वी})}$$

$$= \frac{120+240}{2 \times 36 \times \frac{5}{18}}$$

$$= \frac{360}{10} \Rightarrow 36 \text{ sec}$$

(दृष्टिस्थली सां.वी.  
 $\Rightarrow 45 - 9 = 36 \text{ K/h.}$ )

(25)

$$t = \frac{l}{R.S (\text{सां.वी})}$$

$$= \frac{10 \text{ m}}{66 \times \frac{5}{18} \text{ s}}$$

$$= 2 \times 3 \Rightarrow 6 \text{ sec}$$

(वृत्तिक्रमिक सर्वरूप सां.वी.)

$$\Rightarrow 60 + 6 = 66 \text{ K/h.}$$

(26)

$$t = \frac{l_1 + l_2}{R.S (\text{सां.वी})}$$

$$t = \frac{200+150}{5 \times \frac{5}{18}} = \frac{350 \times 18}{25} = 252 \text{ sec}$$

(27)

$$t = \frac{l_1 + l_2}{R.S (\text{सां.वी})}$$

$$t = \frac{140+160}{100 \times \frac{5}{18} \text{ s}} = \frac{300 \times 18}{100 \times 5} = \frac{54}{5} = 10.8$$

$$8) t = \frac{l_1 + l_2}{R.S. (\text{సంవే})}$$

$$\times 3) \quad \frac{1100 + 900 \text{ m}}{150 \times \frac{5}{25}} = \frac{\frac{16}{80} \text{ m}}{\frac{25 \times 5}{3} \text{ s}} = 48 \text{ sec.}$$

$$9) \quad \text{రైల్వేగొ} = x \text{ kN} / \text{b.} \quad \text{ఒకే దిశ (-)}$$

$$\text{మర్పి} = 5 \text{ kN} / \text{b.}$$

$$\text{నొప్పిట్లింగో} = (x - 5) \text{ kN} / \text{b.}$$

$$t = \frac{l}{R.S. (\text{సంవే})}$$

$$\frac{2}{10} = \frac{125}{(x-5) \times \frac{5}{18}}$$

$$l_1 = \frac{18 \times 5}{x-5}$$

$$x-5 = 45 \\ x = 50 \text{ kN} / \text{b.}$$

$$10) \quad \text{రైల్వేగొ} = x \text{ kN} / \text{b.} \quad \text{శ్రుతి వీధి} (+)$$

$$\text{మర్పి} = 6 \text{ kN} / \text{b.}$$

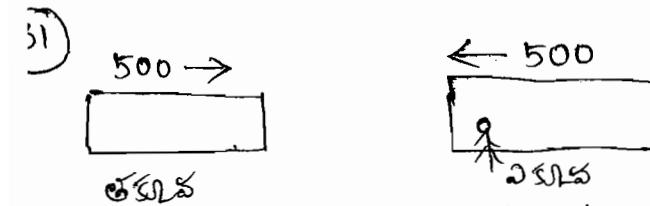
$$\text{నొప్పిట్లింగో} = (x + 6) \text{ kN} / \text{b.}$$

$$t = \frac{l}{R.S. (\text{సంవే})}$$

$$6 = \frac{22}{(x+6) \times \frac{18}{10}}$$

$$l_1 = \frac{22 \times 18}{(x+6)}$$

$$x+6 = 66 \\ x = 60 \text{ kN} / \text{b.}$$



$$\text{నొప్పిట్లింగో} = 45 + 30 = 75 \text{ kN} / \text{b.}$$

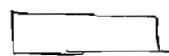
రైల్వే నిచాట కాల్చణి సమయం =

$$t = \frac{l}{R.S. (\text{సంవే})}$$

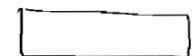
$$= \frac{500}{25 \times \frac{5}{18}} \text{ m}$$

$$= 6 \times 4 \Rightarrow 24 \text{ sec}$$

(32)



$$l_1 = l$$

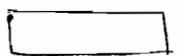


$$l_2 = l.$$

$$t = \frac{l_1 + l_2}{R.S. (\text{సంవే})}$$

$$36 = \frac{l + l}{10 \times \frac{5}{18}} \Rightarrow \frac{2}{36} = \frac{2l \times 18}{10 \times 5} = l = 50 \text{ m.}$$

(33)



$$l_1 = 270$$



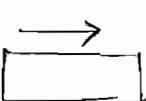
$$l_2 = x$$

$$t = \frac{l_1 + l_2}{R.S. (\text{సంవే})}$$

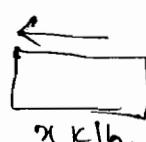
$$9 = \frac{270 + x}{200 \times \frac{5}{18}}$$

$$l_1 = \frac{(270 + x) \times 18}{200 \times 5} = 500 = 270 + x \\ x = 300 \text{ m.}$$

(34)



$$x \text{ kN} / \text{b.}$$



$$t = \frac{l_1 + l_2}{R.S. (\text{సంవే})}$$

$$12 = \frac{120 + 120}{2x \times \frac{5}{18}}$$

$$x^2 = \frac{240 \times 18}{2x \times 5}$$

$$x = 36 \text{ kN} / \text{b.}$$

శ్రుతి వీధి రంధ్రమైని  
= x + x \text{ kN} / \text{b.}  
= 2x \text{ kN} / \text{b.}

$$35) \text{ మొదటి వేగం } = x$$

$$\text{రెండవ త్రయిల్సింగం } = y$$

$$\begin{array}{l|l} t = \frac{l}{s} & t' = \frac{l}{s} \\ l_1 = \frac{120}{x} & l_2 = \frac{120}{y} \\ x = 12 \text{ m/s} & y = 8 \text{ m/s.} \end{array}$$

$$t = \frac{l_1 + l_2}{R.S. (\text{నా.వీ})}$$

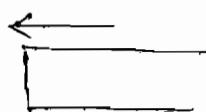
$$t = \frac{120 + 120}{\frac{12+8}{s}} = \frac{240}{20} = 12 \text{ Sec.}$$

36)



$$l_1 = 108$$

$$S_1 = 50 \text{ km/h.}$$



$$l_2 = 112$$

$$S_2 = x \text{ km/h.}$$

$$\text{సమీక్షా వేగం } = (50+x) \text{ km/h.}$$

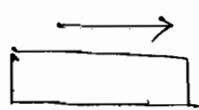
$$t = \frac{l_1 + l_2}{R.S. (\text{నా.వీ})}$$

$$\begin{aligned} 6 &= \frac{108 + 112}{(50+x) \times \frac{5}{18}} \\ 6 &= \frac{220 \times 18}{(50+x) 5} \end{aligned}$$

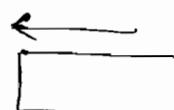
$$50+x = 132$$

$$x = 132 - 50 \Rightarrow 82 \text{ km/h.}$$

37)



$$l_1 = 100$$



$$l_2 = 200$$

$$S_1 = 120 \text{ km/h.}$$

$$S_2 = x \text{ km/h.}$$

$$\text{సమీక్షా వేగం } = (120-x)$$

$$t = \frac{l_1 + l_2}{R.S.}$$

$$120 \text{ sec} = \frac{100 + 200}{(120-x) \times \frac{5}{18}}$$

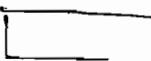
$$120 = \frac{300 \times 18}{(120-x) \times 5}$$

$$120 - x = 9$$

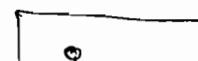
$$x = 120 - 9 \Rightarrow 111 \text{ km/h.}$$

38)

$$l_1 = l$$



విధివ.



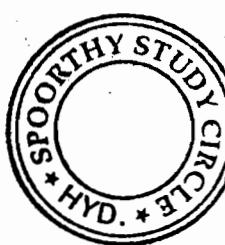
తెచ్చివ.

$$S_1 = 45 \text{ km/h.}$$

$$S_2 = 36 \text{ km/h.}$$

$$\text{సమీక్షా వేగం } = 45 + 36 = 81 \text{ km/h.}$$

$$\text{ప్రథమ వర్షం } t = \frac{l}{R.S. (\text{నా.వీ})}$$

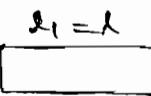


$$8 = \frac{l}{\frac{8 \times 5}{9 \times 18}}$$

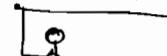
$$8 = \frac{2l}{45}$$

$$l = 45 \times 4 \Rightarrow 180 \text{ m.}$$

39)



విధివ.



తెచ్చివ.

$$S_1 = 40 \text{ km/h.}$$

$$S_2 = 20 \text{ km/h.}$$

$$\text{సమీక్షా వేగం } = 40 - 20 \text{ (ప్రశ్న) } = 20 \text{ km/h.}$$

$$\text{ప్రథమ వర్షం } t = \frac{l}{R.S. (\text{నా.వీ})}$$

$$5 = \frac{l}{\frac{20 \times 5}{10 \times 18}}$$

$$5 = \frac{9l}{50} \Rightarrow l = \frac{250}{9}$$

40)

$$\text{ప్రథమాంశము } = l$$

$$\text{ప్రథమ వేగం } = x \text{ km/h.}$$

$$\begin{array}{l} l \rightarrow \text{ } \rightarrow \\ x \text{ km/h. } 24 \text{ km/h. } \end{array}$$

$$t = \frac{l}{R.S. (\text{నా.వీ})}$$

$$\begin{array}{l} l \rightarrow \text{ } \rightarrow \\ x \text{ km/h. } 4 \text{ km/h. } \end{array}$$

$$t = \frac{l}{R.S}$$

$$q = \frac{l}{(x-2) \times 5}$$

$$q_1 = \frac{l \times 18^2}{(x-2) \times 5}$$

$$l = \frac{5(x-2)}{2}$$

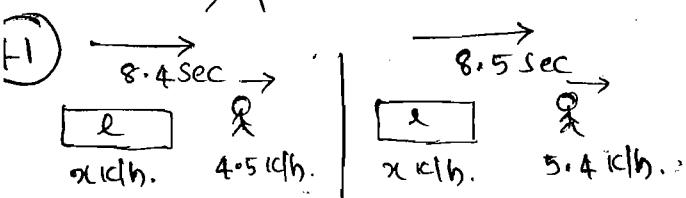
$$\frac{q_1(x-2)}{2} \times \frac{25(x-4)}{9}$$

$$9x - 18 = 10x - 40$$

$$x = 22$$

$$l = \frac{5(22-2)}{2}$$

$$l = \frac{5(20)}{2} \Rightarrow l = 50$$



$$\text{రైపోంటు} = l$$

$$\text{రైపోంటు} = x \text{ km/h.}$$

$$t = \frac{x}{R.S} - l \text{ సెండ్స్}$$

$$\frac{s_1}{s_2} = \frac{t_2}{t_1}$$

$$\frac{x-4.5}{x-5.4} = \frac{8.5}{8.4} \rightarrow \begin{pmatrix} \text{ఒకసారం కంపాల} \\ \text{ఒకసారం అంశాల్ని } \end{pmatrix}$$

$$\frac{2x-9.9}{0.9} = \frac{16.9}{1} \quad \leftarrow \begin{array}{l} \text{ఏ స్టేప్?} \\ \text{Componendo ఓపి దివిదెండో} \\ \text{formula వాడో} \end{array}$$

$$\frac{20x - 99}{9} = 16.9$$

$$20x = 16.9 \times 9 + 99$$

$$20x = 9(16.9 + 11)$$

$$20x = 9 \times (18.9)$$

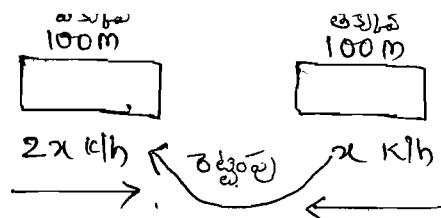
$$x = 8.1$$

$$10 = \frac{l}{(x-4) \times 5}$$

$$10 = \frac{l \times 18^2}{(x-4) \times 5}$$

$$l = \frac{25(x-4)}{9}$$

42



$$\text{సమితి వీరో} = 2x + x = 3x \text{ km/h.}$$

$$t = \frac{l_1 + l_2}{R.S \text{ (సా.వీ.)}}$$

$$8 = \frac{100 + 100}{\frac{3x \times 5}{186} \text{ s}}$$

$$8 = \frac{200}{\frac{5x}{186} \text{ s}}$$

$$x = 5 \times 6 \Rightarrow 30 \text{ km/h.}$$

43

మొదటి రో

$$t = \frac{l}{s}$$

$$15 = \frac{150}{s_1}$$

$$s_1 = 10 \text{ m/s.}$$

$$s_1 = \frac{10 \times 18}{8.1} \text{ km/h.}$$

$$s_1 = 36 \text{ km/h.}$$

$$15 \text{ m}$$

$$s_1 = 150 \text{ m}$$

$$s_1 = 36 \text{ km/h.}$$

$$20 \text{ m}$$

$$s_2 = 150 \text{ m}$$

$$s_2 = x \text{ km/h.}$$

$$t = \frac{l_1 + l_2}{R.S.}$$

$$8 = \frac{150 + 150}{(36+x) \times 5}$$

$$8 = \frac{300 \times 18}{(36+x) \times 5}$$

$$36+x = 15 \times 9$$

$$36+x = 135$$

$$x = 99 \text{ km/h.}$$

44

మండి

$$l_1 = 2l_m$$

పండి

$$l_2 = l_m$$

$$t = \frac{l_1 + l_2}{R.S}$$

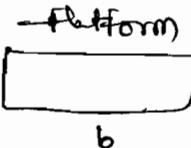
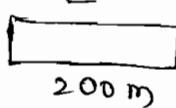
$$12 \text{ sec} = \frac{2l + l}{590 \times 5}$$

$$12 = \frac{3l}{25} \Rightarrow l = 100$$

$$l_1 = 2l$$

$$l_1 = 2(100) \Rightarrow 200$$

మన్మరి



$$t = \frac{l+b}{s}$$

$$\frac{15}{45} \text{ sec} = \frac{200+b}{\frac{18 \times 5}{8} \frac{\text{m}}{\text{s}}} \quad \leftarrow$$

$$45 = \frac{3(200+b)}{40}$$

$$600 = 200 + b$$

$$b = 400 \text{ m.}$$

45

$l_1$

$$\text{వీటి}_0 = x \text{ km/h.}$$

$$t = \frac{l}{s}$$

$$27 = \frac{l_1}{x}$$

$$l_1 = 27x$$

$l_2$

$$\text{వీటి}_0 = y \text{ km/h.}$$

$$t = \frac{l}{s}$$

$$17 = \frac{l_2}{y}$$

$$l_2 = 17y.$$

$l_1$

$$\text{వీటి}_0 = x$$

$l_2$

$$\text{వీటి}_0 = y$$

$$\text{వచ్చందుపుగా సేవీ = } x+y$$

$$t = \frac{l_1+l_2}{R.S.}$$

$$23 = \frac{27x+17y}{x+y}$$

$$23x+23y = 27x+17y$$

$$4x = 6y$$

$$\frac{x}{y} = \frac{6}{4} \Rightarrow \frac{3}{2}$$

OR

45

23 Sec

$l_1$

27 Sec

$l_2$

17 Sec

వీటిల నీపుత్తి

మనం రాలన్కి Allegation Rule apply చేయగా

$x : y$

27 : 17

23

(23-17)

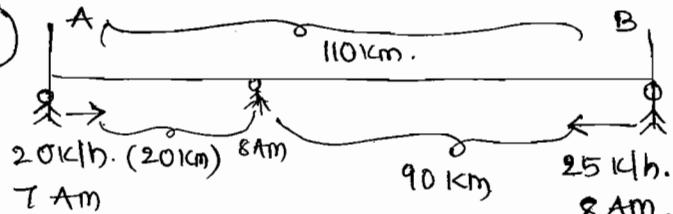
(27-23)

$\frac{8}{3} : \frac{4}{2}$

3 : 2



46



$$\text{దూరం } s = s \times t = 20 \text{ km/h.} \times 1 \text{ hr.} \Rightarrow 20 \text{ km.}$$

$$\text{ఎంచుటుపుగా సా. వీటి}_0 = 20 + 25 = 45 \text{ km/h.}$$

$$\text{సి.ఎ. విభజనమయి} = \frac{\text{ధూ. దూరం}}{\text{సా. వీ}}$$

$$= \frac{90 \text{ km}}{45 \text{ km/h}}$$

$$= 8 \text{ Am} + 2 \text{ hr}$$

$$= 10 \text{ Am.}$$

A ఉపరి

$s_1$   
X రై

$t_2$

B తలికి

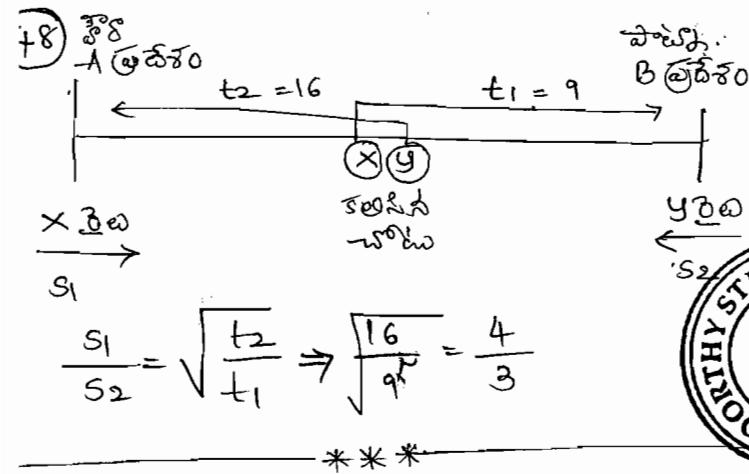
$y$   
రై

$t_1$

$s_2$

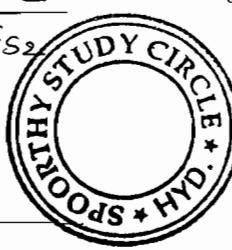
X అస్తిత్వానిల్లా, Y అస్తిత్వానిల్లా అని కావలి. ఏంటెండు దృష్టిమానములోని తరువాత X కిలు తనగమ్మన్నానీ రథాన్ని చూసినప్పుడు, Y కిలు తనగమ్మన్నానీ రథాన్ని చూసినప్పుడు తీసుపంచి

$$\text{వాటి వీటిల నీపుత్తి} \Rightarrow \frac{s_1}{s_2} = \sqrt{\frac{t_2}{t_1}}$$



Example 1:

వాటా వేగం $a = 12$	విషాదికం $x = ?$
ఎచుమగా వేగం $b = 4$	ఉపాపా వేగం $y = ?$
$x = \frac{a+b}{2}$	$x = \frac{a-b}{2}$
$= \frac{12+4}{2}$	$= \frac{12-4}{2}$
$= \frac{16}{2}$	$= \frac{8}{2}$
$= 8$	$= 4.$



## BOATS & STREAMS

వ్యవస్థలు - త్రవ్యవస్థలు

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మర్యాదలీ/వంపువేగం (సిలర్డెంట్లో) =  $x$  km/h.

త్రవ్యవస్థలీ/సింటి/సది/పిట్టి వేగం =  $y$  km/h.

విట్టికి వాటా వేగం (త్రవ్యవస్థలీవేగం)  $a = x+y$ .

విట్టికి ఎదురుగా వేగం (త్రవ్యవస్థలీ వ్యతిశాఖా చింతలో)  $b = x-y$

5)  $\left. \begin{array}{l} \text{విట్టికి వాటా వేగం} - a \\ \text{విట్టికి ఎదురుగా వేగం} - b \end{array} \right\} \Rightarrow \text{మర్యాదలీ వంపువేగం } x =$

$$x = \frac{a+b}{2} = \frac{\text{విట్టికి వాటా} + \text{విట్టికి ఎదురుగా}}{2}$$

6)  $\left. \begin{array}{l} \text{విట్టికి వాటా వేగం} - a \\ \text{విట్టికి ఎదురుగా వేగం} - b \end{array} \right\} \Rightarrow \text{త్రవ్యవస్థలీ } y =$

$$y = \frac{a-b}{2} = \frac{\text{విట్టికి వాటా} - \text{విట్టికి ఎదురుగా}}{2}$$

$Eg = 2$

" తీవ్ర సూత్రాలు :

మర్యాదలీ/వంపువేగం =  $x$

త్రవ్యవస్థలీ/సింటి వేగం =  $y$

విట్టికి వాటా వేగం =  $a$

విట్టికి ఎదురుగా వేగం =  $b$

R.S. Aggarwal Book

1) విట్టికి వాటా వేగం  $a = \frac{\text{దూరం}}{\text{త్రయి}} = \frac{11 \text{ km}}{1 \text{ hr}} = 11 \text{ km/h.}$

విట్టికి ఎదురుగా వేగం  $b = \frac{\text{దూరం}}{\text{త్రయి}} = \frac{5 \text{ km}}{1 \text{ hr}} = 5 \text{ km/h.}$

సిలర్డెంట్లు వంపువేగం  $x = \frac{a+b}{2}$

$$x = \frac{11+5}{2}$$

$$x = \frac{16}{2} \Rightarrow 8$$

2) త్రవ్యవస్థలీ వేగం  $y = ?$

విట్టికి వాటా వేగం  $a = 13 \text{ km/h.}$

" ఎదురుగా "  $b = 8 \text{ km/h.}$

$$y = \frac{a-b}{2} = \frac{13-8}{2} = \frac{5}{2} \Rightarrow 2.5$$

3)

త్రవ్యవస్థలీ వేగం  $y = ?$

విట్టికి వాటా వేగం  $a = \frac{\text{దూరం}}{\text{త్రయి}} = \frac{32 \text{ km}}{6 \text{ hrs}}$

విట్టికి ఎదురుగా వేగం  $b = \frac{\text{దూరం}}{\text{త్రయి}} = \frac{14 \text{ km}}{6 \text{ hrs.}}$

$$y = \frac{a-b}{2}$$

$$y = \frac{\frac{32}{6} - \frac{14}{6}}{2} \Rightarrow y = \frac{\frac{18}{6}}{2} \Rightarrow y = \frac{3}{2} = 1.5$$

④ త్రివార్షిక వీటిగం  $y = ?$

$$x = \frac{a+b}{2} = \frac{6+4}{2} = \frac{10}{2} = 6 \text{ km/hr.}$$

విట్టి వాయాగా వీగం  $a = \frac{60}{5} = \frac{16 \text{ km}}{2 \text{ hrs}} = 8 \text{ km/h.}$

విట్టి ఎదురుగా వీగం  $b = \frac{60}{5} = \frac{16 \text{ km}}{4 \text{ hrs}} = 4 \text{ km/h.}$

$$x = \frac{a+b}{2}$$

$$x = \frac{8+4}{2} = \frac{12}{2} = 6 \text{ km/hr.}$$

⑤ త్రివార్షిక వీటిగం  $y = ?$

వీటి వాయాగా వీగం  $a = \frac{60}{5} = \frac{1 \text{ km}}{10 \text{ min}}$   
 $= \frac{1 \text{ km}}{\frac{10}{60} \text{ hr}} \Rightarrow 6 \text{ km/hr.}$

విట్టి ఎదురుగా వీగం  $b = \frac{60}{5} = \frac{21 \text{ km}}{1 \text{ hr}} = 21 \text{ km/h.}$

అస్తుల నీటిపెర్మిట్ వీగం  $x = \frac{a+b}{2} = \frac{6+2}{2} = \frac{8}{2} = 4 \text{ km/h.}$

వీగం  $x = 4 \text{ km/h.}$

$$\text{సాధారణ సమయం } t = \frac{d}{s} = \frac{1 \text{ km}}{4 \text{ km/h}} = 1 \frac{1}{4} \text{ hr}$$

$1 \frac{1}{4}$  గండు ఒకసాయి 15 రోహితా.

⑥

విట్టి ఎదురుగా  $\rightarrow$

$$\frac{11}{4} \div \frac{3}{4} = \frac{11}{4} \times \frac{4}{3} = \frac{11}{3} = 3 \frac{2}{3} \text{ సాయి}$$

విట్టి వాయాగా  $\rightarrow 7 \frac{1}{2}$

$$7 \frac{1}{2} = \frac{15}{2} \text{ సాయి} \times \frac{1}{\frac{3}{4}} = \frac{1}{8} \text{ సాయి}$$

విట్టి వాయాగా వీగం  $a = \frac{60}{5} = \frac{3}{4} \text{ km}$   
 $\frac{1}{8} \text{ hr}$   
 $= \frac{3}{4} \times \frac{8}{1} = 6 \text{ km/h.}$

విట్టి ఎదురుగా  $b = \frac{60}{5} = \frac{3}{4} \text{ km}$   
 $\frac{3}{16} \text{ hrs}$   
 $= \frac{3}{4} \times \frac{16}{3} = 4 \text{ km/h.}$

వాయాగా	ఎదురుగా
$s_1 = x+y$	$s_2 = x-y$
$d_1 = d$	$d_2 = d$
$t_1 = t$	$t_2 = 3t$

$$s = \frac{x+y}{t} - \frac{x-y}{3t} \quad [s < \frac{1}{t}]$$

$$\frac{s_1}{s_2} = \frac{t_2}{t_1} = \frac{x+y}{x-y} \times \frac{3t}{t} \Rightarrow x+y = 3x-3y$$

$$2x = 4y \quad [$$

$$\frac{x}{y} = \frac{2}{1} = x:y = 2:1 \quad [\text{సమానంగా 2 రాశులు ఉంది}]$$

వాయాగా	ఎదురుగా
$s_1 = x+y$	$s_2 = x-y$
$d_1 = d$	$d_2 = d$
$t_1 = 4 \text{ సాయి}$	$t_2 = 8 \text{ సాయి} = 48 \text{ రోహితా}$ $= 8 \text{ సాయి} = \frac{48}{60} \text{ సాయి}$ $= \frac{8}{5} =$ $= 44/5$

$$s = \frac{x+y}{t} - \frac{x-y}{3t}$$

$$\frac{s_1}{s_2} = \frac{t_2}{t_1} \Rightarrow \frac{x+y}{x-y} = \frac{\frac{44}{5}}{\frac{4}{1}}$$

$$\Rightarrow \frac{x+y}{x-y} = \frac{11}{5}$$

$$= 5x + 5y = 11x - 11y$$

$$= \frac{3}{8}x = \frac{8}{16}y$$

$$= \frac{x}{y} = \frac{8}{3}$$

⑨

$$\text{విట్టి వీగం } b = \frac{60}{5} = \frac{12 \text{ km}}{60 \text{ min}} = 10 \text{ km/h.}$$

త్రివార్షిక వీగం  $y = 3 \text{ km/h.}$

$$b = x-y$$

$$10 = x-3 \Rightarrow x = 13 \text{ km/h.}$$

⑩ ఉపాయిస్తున్నం  $y = 2.5 \text{ km}$ .

ఏటింగ్ వేగం  $a = 15 \text{ km/h}$ .

విట్కింగ్ వేగం  $b = ?$

$$y = \frac{a-b}{2}$$

$$2.5 = \frac{15-b}{2} = 5 = 15-b \Rightarrow b = 10$$

⑪ మర్చి పడవిగం  $x = 5 \text{ km/h}$ .

ఏటింగ్ వేగం  $a = ?$

విట్కింగ్ వేగం  $b = 30.5 \text{ km/h}$ .

$$x = \frac{a+b}{2}$$

$$5 = \frac{a+3.5}{2}$$

$$10 = a + 3.5 \Rightarrow a = 6.5.$$

⑫ మర్చి పడవిగం  $x = 13 \text{ km/h}$ .

ఉపాయిస్తున్నం  $y = 4 \text{ km/h}$ .

ఏటింగ్ వేగం  $a = x+y = 13+4 = 17 \text{ km/h}$ .

విట్కింగ్ వేగం  $= 17 \text{ km/h}$ .

$$\text{సాధారణ సమయం } t = \frac{d}{s} = \frac{68 \text{ km}}{17 \text{ km/h}} = 4 \text{ hrs.}$$

⑬ మర్చి పడవిగం  $x = 9 \text{ km/h}$ .

ఉపాయిస్తున్నం  $y = 1.5 \text{ km/h}$ .

$$t = \frac{d}{s}$$

విట్కింగ్ వేగం  $a = 10.5 \text{ km/h}$ .

విట్కింగ్ వేగం  $b = 7.5 \text{ km/h}$ .

$\text{Total time} = \frac{t_{\text{down}}}{(\text{పాటగ})} + \frac{t_{\text{up}}}{(\text{ఎదుపగ})}$

$$= \frac{d}{s(\text{పాటగ})} + \frac{d}{s(\text{ఎదుపగ})}$$

$$= \frac{105 \text{ km}}{10.5 \text{ km/h}} + \frac{105 \text{ km}}{7.5 \text{ km/h}}$$

$$= \frac{105}{10.5} + \frac{105}{7.5} \quad \left( \frac{15 \times 5}{15 \times 7} \right)$$

$$= 10 + 14 \Rightarrow 24 \text{ hrs.}$$

⑭  $x = 15 \text{ km/h}, y = 3 \text{ km/h}, a = ?$

$$a = x+y \Rightarrow 15+3 \Rightarrow 18$$

$$18 \text{ km/h} \times \frac{12}{605} \Rightarrow \frac{18}{5} \Rightarrow 3.6 \text{ km}$$

⑮

మర్చి పడవిగం  $x = 5 \text{ km/h}$ .

ఉపాయిస్తున్నం  $y = 1 \text{ km/h}$ .

విట్కింగ్ వేగం  $a = 6 \text{ km/h}$ .

" ఎదుపగ "  $b = 4 \text{ km/h}$ .

$$\text{Total Time} = \frac{t_{\text{down}}}{(\text{పాటగ})} + \frac{t_{\text{up}}}{(\text{ఎదుపగ})}$$

$$= \frac{d}{s(\text{పాటగ})} + \frac{d}{s(\text{ఎదుపగ})}$$

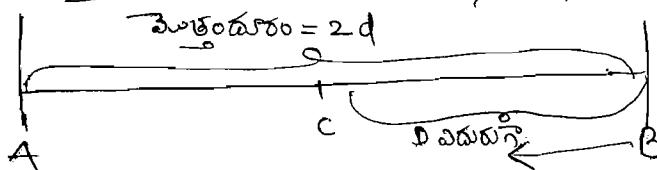
$$\text{Total time} = \frac{d}{6} + \frac{d}{4}$$

$$\text{Total time} = \frac{2d+3d}{12}$$

$$5d = 12 \Rightarrow d = \frac{12}{5} = 2.4 \text{ km}$$

⑯  $x = 14 \text{ km/h}, y = 4 \text{ km/h}, a = 18 \text{ km/h}, b = 10 \text{ km/h}$ .

→ పాత్రం దూరం  $= 2d$



$\text{Total time} = \frac{t_{\text{down}}}{(\text{పాటగ})} + \frac{t_{\text{up}}}{(\text{ఎదుపగ})}$

$$19 \text{ hrs} = \frac{2d}{s(\text{పాటగ})} + \frac{d}{s(\text{ఎదుపగ})}$$

$$19 \text{ hrs} = \frac{2d}{18} + \frac{d}{10}$$

$$19 = \frac{10d+9d}{90}$$

$$19 = \frac{19d}{90}$$

$$d = 90$$

పాత్రం దూరం  $2d = 2 \times 90 \Rightarrow 180 \text{ km}$

$$17) x = 9 \frac{1}{3} \text{ km} = \frac{28}{3} \text{ km/h.}$$

$$a = \frac{28}{3} + y = \frac{28+3y}{3}$$

$$b = \frac{28}{3} - y = \frac{28-3y}{3}$$

$$y = ?$$

వాయిద	వచ్చువగా
$s_1 = \frac{28+3y}{3}$	$s_2 = \frac{28-3y}{3}$
$d_1 = d$	$d_2 = d$
$t_1 = t$	$t_2 = 3t$
$s = \frac{d}{t}$	

$$\frac{s_1}{s_2} = \frac{t_2}{t_1} \Rightarrow \frac{28+3y/d}{28-3y/d} = \frac{3t}{t} \\ \Rightarrow \frac{28+3y}{28-3y} \times \frac{d}{d} = 3$$

$$\Rightarrow 28+3y = 84-9y$$

$$\frac{12y}{3} = 56 \\ y = \frac{14}{3} \Rightarrow 4 \frac{2}{3} \text{ km/h.}$$

$$18) x = x, y = 3, a = x+3, y = x-3.$$

వాయిద	వచ్చువగా
$s_1 = x+3$	$s_2 = x-3$
$d_1 = d$	$d_2 = d$
$t_1 = 1 \text{ hr.}$	$t_2 = 1 \frac{1}{2} \text{ hr.} = \frac{3}{2} \text{ hr.}$
$s = \frac{d}{t} \rightarrow \text{మరొ}$	

$$\frac{s_1}{s_2} = \frac{t_2}{t_1} \Rightarrow \frac{x+3}{x-3} \times \frac{3}{2} = 1$$

$$2x+6 = 3x-9$$

$$x = 15 \text{ km/h.}$$

19) బల్లదనిటం పూండ్రభూషితిగొంతులో 15 km/h. వ్యాపారాలలో తెగ్గిరశదస్తి 4గోల్ల 30గోల్ల సమయం ఎత్తితే అవశ్యకిగొంతులో ఎంత? [km/h]?

$$x = 15 \text{ km/h}, y = 4 \text{ km/h.}$$

$$a = x+y, b = x-y$$

$$a = (15+y), b = (15-y)$$

$$\text{Total time} = t_{\text{down}} + t_{\text{up}} \\ (\text{వాయిద}) + (\text{వచ్చువగా})$$

$$\frac{9}{2} = \frac{d}{s(\text{వాయిద})} + \frac{d}{s(\text{వచ్చువగా})}$$

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

Go with Option  $y = 5 \text{ g}$  ఏత్తించిని...

$$\frac{9}{2} = \frac{30}{15+5} + \frac{30}{15-5}$$

$$4.5 = \frac{30}{20} + \frac{30}{10}$$

$$4.5 = 1.5 + 3$$

$$4.5 = 4.5$$

$$\frac{9}{2} = 30 \left( \frac{15-y+15+y}{15^2-y^2} \right)$$

$$\frac{9}{2} = 30 \left( \frac{30}{225-y^2} \right)$$

$$225-y^2 \Rightarrow y = 5 \text{ Answer.}$$

$$20) x = 10 \text{ km/h}, y = 4 \text{ km/h.}$$

$$a = 10+y, b = 10-y$$

26 km వెలుస్తువంగా = 14 km వచ్చువగా సమయం

$$t_1 = t_2$$

$$\frac{d_1}{s_1(\text{వాయిద})} = \frac{d_2}{s_2(\text{వచ్చువగా})}$$

$$\frac{13}{26} = \frac{7}{10+y} \times \frac{14}{10-y}$$

$$130-13y = 70+7y$$

$$20y = 60$$

$$y = 3.$$

$$① x = 10 \text{ m/h}, y = y \text{ m/h}$$

$$a = 10+y, b = 10-y \quad \frac{36}{260}$$

వదులుగానమయి - వాటాగానమయి = 90 \text{ p} \parallel

$$t_1 - t_2 = \frac{3}{2} \text{ hrs}$$

$$\frac{d_1}{s_1(\text{వాటా})} - \frac{d_2}{s_2(\text{వదులు})} = \frac{3}{2} \text{ hrs}$$

$$\frac{36}{10-y} - \frac{36}{10-y} = \frac{3}{2}$$

Go with Options  $y = 2$  అన్నటనుచూ.

$$\frac{12}{36} \left( \frac{10+y - 10+y}{10^2 - y^2} \right) = \frac{3}{2}$$

$$\frac{24y}{100 - y^2} \neq \frac{1}{2}$$

$$100 - y^2 = 48y$$

$$y^2 + 48y - 100 = 0$$

$$y^2 + 50y - 2y - 10 = 0$$

$$4(y+50) - 2(y+50) = 0$$

$$(y+50)(6y-2)$$

$$y = 2$$

$$② x = x, y = y, a = x+b, b = x-y$$

4 km లింగానమయి = 3 km వదులుగానమయి

$$t_1 = t_2$$

$$\frac{d_1}{s_1(\text{వాటా})} = \frac{d_2}{s_2(\text{వదులు})}$$

$$\frac{4}{x+y} \neq \frac{3}{x-y}$$

$$4x - 4y = 3x + 3y$$

$$\frac{x}{y} = \frac{7}{1}$$

$$x:y = 7:1$$

7a, 1a అన్నటనుచూ.

$$\text{Total} = t_{\text{down}} + t_{\text{up}}$$

$$14 = \frac{d}{s(\text{వాటా})} + \frac{d}{s(\text{వదులు})}$$

$$14 = \frac{48^6}{8a} + \frac{48^8}{6a}$$

$$14 = \frac{6+8}{a} = \frac{14}{a}$$

$$14 = \frac{14}{a}$$

$$a = 1$$

$$\text{③ వాటాగా } y = 2a = 1 \times 1 = 1 \text{ hr.}$$

$$③ \text{ వాటాగా } a = 1, \text{ వదులుగా } b = 1$$

$$t_1 + t_2 = 6 \text{ hrs}$$

$$\frac{d}{s(\text{వాటా})} + \frac{d}{s(\text{వదులు})} = 6 \text{ hrs}$$

$$\frac{36}{a} + \frac{24}{b} = 6$$

$$\left( \frac{6}{a} + \frac{4}{b} = 1 \right) \times 4$$

$$\frac{24}{a} + \frac{16}{b} = 4$$

$$\frac{36}{a} + \frac{24}{b} = 6$$

$$\frac{36}{a} + \frac{24}{8} = 6$$

$$\frac{36}{a} = 7$$

$$a = 12$$

$$y = \frac{a-b}{2} = \frac{12-8}{2} = \frac{4}{2} \Rightarrow 2$$

④

$$\text{వదులుగా } - \text{వాటా } = 6$$

$$\text{వేగా } = x \text{ m/h, త్రావీ } = y \text{ m/h}$$

$$t_1 - t_2 = 6 \text{ hrs}$$

$$\frac{d}{s_1(\text{వాటా})} - \frac{d}{s_2(\text{వదులు})} = 6$$

$$\frac{12}{x-y} - \frac{12}{x+y} = 6$$

$$\frac{2}{12} \left( \frac{xy - x+y}{x^2 - y^2} \right) = 6$$

$$4y = x^2 - y^2$$

$$x^2 = 4y + 4y^2$$

$$y = \frac{8}{3}$$

$$\text{వాటా } - \text{ వదులు } = 1$$

$$\text{వేగా } = 2x, \text{ త్రావీ } = y$$

$$t_1 - t_2 = 1$$

$$\frac{d}{s_1(\text{వాటా})} - \frac{d}{s_2(\text{వదులు})} = 1$$

$$\frac{12}{2x-y} - \frac{12}{2x+y} = 1$$

$$12 \left( \frac{2x+y - 2x+y}{4x^2 - y^2} \right) = 1$$

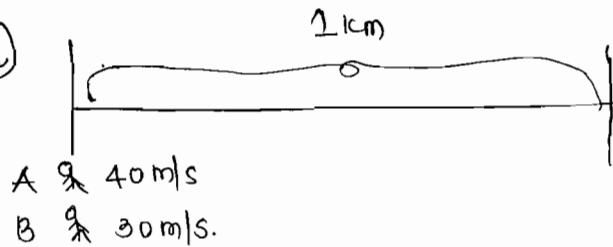
$$24y = 4x - y^2$$

$$24y = 4(4y + 4y^2) - y^2$$

# RACE [పండం | పరుగుపండం]

## Linear Race:

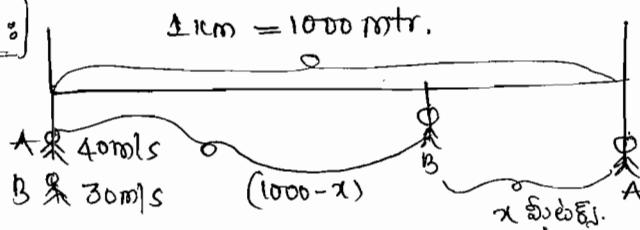
Q1



నీర్ కిలోమీటర్ పరుగుపండంలో A, 40 m/s, B, 30 m/s. వీరంతి పాల్చాల్సానాదు. అయితే ...

- A అసెఅతను B ని ఎంతచూటుతేత్తాతీ ఇంకాండు?
- " " " B ను " " "
- A అసెఅతను B ని ఎంతచూటుతేత్తాతీ ఇంకాండు?
- " " " B ను " " "

iA :



A, B గా మీట్ తేత్తాతీ ఇంకాండు అన్నానువు.

$$\text{టెంపురు} = S = \frac{d}{t} \leftarrow \text{టెంపురు.}$$

$$\frac{S_1}{S_2} = \frac{d_1}{d_2} = \frac{40}{30} \times \frac{1000}{1000 - x}$$

$$= 750 = 1000 - x \quad \Rightarrow x = 250.$$

A, B ను 250 m తేత్తాతీ గెలస్తాడు / ఇంకాండు.

iiA : మొత్తం దూరం 1000 mtr @ A లు ప్రయాసంలు

$$t_1 = \frac{d}{S} = \frac{1000 \text{ m}}{40 \text{ m/s}} = 25 \text{ sec.}$$

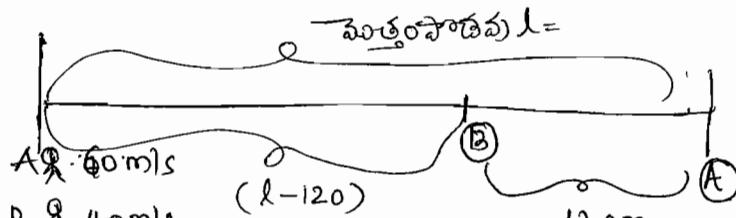
మొత్తం దూరం 1000 mtr @ B లు ప్రయాసంలు

$$t_2 = \frac{d}{S} = \frac{1000 \text{ m}}{30 \text{ m/s}} = 33.33 \text{ sec}$$

$$\text{తేడా} = 33.33 - 25 = 8.33 \text{ sec}$$

A, B గా 8.33 sec తేత్తాతీ ఇంకాండు

Q2) A = 60 m/s, B = 40 m/s, వీరంతి పరుగుపండం పాల్చాల్సా - A అసెఅతను B ని 120m తేడాతీ ఇంకాండు ఎంత?



$$\text{టెంపురు} = S = \frac{d}{t}$$

$$\frac{S_1}{S_2} = \frac{d_1}{d_2}$$

$$\frac{60}{40} \times \frac{l}{l - 120}$$

$$2l = 3l - 360$$

$$l = 360$$

## Circular Race (శృంక్రమపరుగుపండం):

1 ఒచ్చుత్తోసాధ్య మెదడిసాధ కలుపదనకి పెట్టిన సమయం

$$\text{మొత్తం దూరం} \times A \text{ కిమీటర్లు సమయం} = t_1$$

$$" " " B \text{ కిమీటర్లు సమయం} = t_2$$

(i) ఇంకాండు తుయారీస్తు

$$\text{సమయం} = LCM(t_1, t_2)$$

(ii) ప్రతిరుధి సిసలు తుయారీస్తు

$$[\text{సమయం} = LCM(\frac{1}{t_1}, \frac{1}{t_2})] \rightarrow Q$$

2 నీడునాచిం సువవ్వు మెదడిసాధ కలుపదనకి పెట్టిన సమయం ?

(i) ఇంకాండు తుయారీస్తు

$$\text{కలుస్తు విధానికి / పట్టు విధానికి పెట్టిన సమయం} = \frac{(x \cdot \text{సా. త్రస్తు})}{\text{సా. త్రస్తు}}$$

$$[\text{సా. త్రస్తు} = S_1 - S_2] \quad 4$$

(ii) ప్రతిరుధి సిసలు తుయారీస్తు

$$[\frac{x \cdot \text{పట్టు}}{\text{సా. త్రస్తు}} \text{ సమయం}] = \frac{x \cdot \text{సా. త్రస్తు}}{\text{సా. త్రస్తు}}$$

$$\text{సా. త్రస్తు} = S_1 + S_2$$

$$3) \text{ ఎగ్గుసార్లు కలుస్తు} = \frac{x}{4}$$



Q1) 120m ల వ్యతిక్రమ పదును పరిషంచి  $A = 15 \text{ m/s}$ ,  $B = 10 \text{ m/s}$ . వీనంతో త్రయిలేస్తే వారు ఒకటిని చోటు పెండటాలి రూపకాసికి పట్టినపుయం ఇంత?

) దీని హిసటి త్రయిలేస్తే?

i) వ్యతిక్రమ డిస్టాంచ్ త్రయిలేస్తే?

Ans: మొత్తం దూరానికి  $A$  కి పట్టిన సమయం  $t_1 = \frac{d}{s} = \frac{120 \text{ m}}{15 \text{ m/s}} = 8 \text{ s}$ .  
 $t_2 = \frac{d}{s} = \frac{120 \text{ m}}{10 \text{ m/s}} = 12 \text{ s}$ .  
 మొత్తం దూరానికి  $B$  కి పట్టిన సమయం  $t_2$   
 $t_2 = \frac{d}{s} = \frac{120 \text{ m}}{8 \text{ m/s}} = 15 \text{ s}$ .  
 iA: దీని హిసటి త్రయిలేస్తే  
 సమయం =  $\text{Lcm}(t_1, t_2)$   
 కస్టాగు =  $\boxed{18/15} = 120 \text{ sec}$

iA: వ్యతిక్రమ డిస్టాంచ్ త్రయిలేస్తే  
 సమయం =  $\text{Lcm}(t_1, t_2)$   
 కస్టాగు =  $\boxed{8, 15} = 120 \text{ sec}$ .

Q2) 180m వ్యతిక్రమ పదును పరిషంచి  $A = 15 \text{ m/s}$ ,  $B = 12 \text{ m/s}$ , వీనంతో త్రయిలేస్తే వీరు చెందువు వద్ద పెండటాలి రూపకాసికి పట్టినపుయం ఇంత?

) దీని హిసటి (ii) వ్యతిక్రమ డిస్టాంచ్ త్రయిలేస్తే.

Ans: త్రిప. పట్టినపుయం =  $\frac{\text{భ. వ. దూరం}}{\text{సాధీగొ}}$   
 $\text{సాధీగొ} = S_1 - S_2$ .  
 $= 15 - 12$   
 $= 3 \text{ m/s}$ .  
 $= \frac{+180 \text{ m}}{3 \text{ m/s}}$   
 $= 60 \text{ sec}$

PA) త్రిప. పట్టినపుయం =  $\frac{\text{భ. వ. దూరం}}{\text{సాధీగొ}}$   
 $\text{సాధీగొ} = S_1 + S_2$   
 $= 15 + 12$   
 $= 27 \text{ m/s}$ .  
 $= \frac{+180 \text{ m}}{27 \text{ m/s}}$   
 $= 6.66 \text{ sec}$

Q3) 200m వ్యతిక్రమ పదును పరిషంచి  $A = 25 \text{ m/s}$ ,  $B = 10 \text{ m/s}$ , వీనంతో త్రయిలేస్తే (నేడి హిసటి) వారు ఎన్నిసామ్మ రూపను తంచురు.  
 ఒకటినేడి నేడి సుండి ...  
 $\text{మొత్తం దూరానికి } A \text{ కి పట్టిన సమయం} = \frac{200}{25} = 8 \text{ sec}$   
 $\text{మొత్తం దూరానికి } B \text{ కి పట్టిన సమయం} = \frac{200}{10} = 20 \text{ sec}$   
 ఒకటినేడి త్రయిలేస్తే (వీరు చెందిన పుయం)  
 $\text{త్రిప. పట్టినపుయం} = \frac{\text{భ. వ. దూరం}}{\text{సాధీగొ}}$   
 $\text{సాధీగొ} = 25 - 10$   
 $= 15 \text{ m/s}$   
 $= \frac{200 \text{ m}}{15 \text{ m/s}} = \frac{40}{3} \text{ sec}$   
 $\text{ఎన్నిసామ్మ రూపను} = \frac{\text{ఒకటినేడి నేడి సమయం}}{\text{ఒకటినేడి నేడి సమయం}}$   
 $= \frac{\frac{40}{3}}{8} \Rightarrow 3 \text{ సామ్మ} \dots$

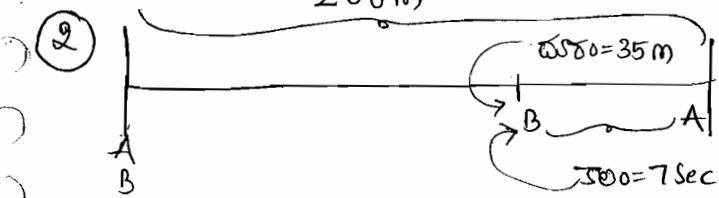
**R.S. Aggarwal Book**

①

మొత్తం 100m పదును పరిషంచి  $A$  కి పట్టిన సమయం = 36 sec  
 " " " " "  $B$  కి పట్టిన సమయం = 45 sec  
 త్రిఫోడ్ =  $45 - 36 = 9 \text{ sec}$   
 A, B ల 9 sec ల ప్రతి దశలి గొప్పాడు.

②  $\Rightarrow 45 \rightarrow 100 \text{ m}$   
 $9 \rightarrow ?$   
 $\frac{9 \times \frac{20}{3}}{45} \Rightarrow 20 \text{ m}$

200m



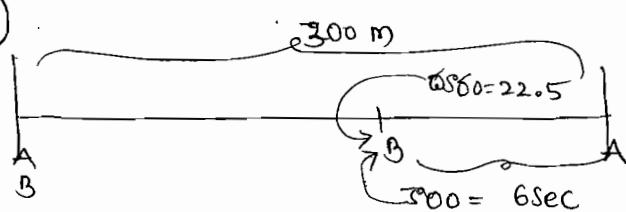
B దూరం  $\frac{200 \text{ విట్టింగ్}}{35 \text{ m}} \rightarrow 7 \text{ sec}$

మొత్తం దూరం  $200 \text{ m} \rightarrow ? = \frac{200 \times 7}{35} = 40 \text{ sec}$

B ఒకసాయాదు = ఎల్లంకాదు = 40 sec

A గెలంగాదు = తల్లంకాదు = 40 - 7 = 33 sec

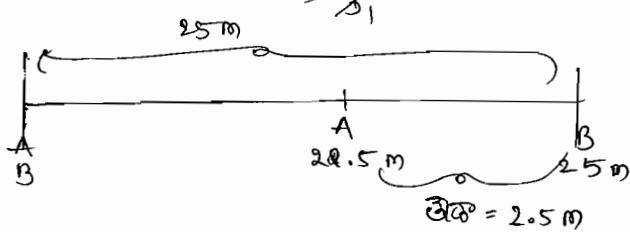
3



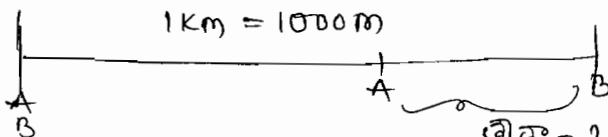
B దూరం  $\frac{200 \text{ విట్టింగ్}}{22.5 \text{ m}} \rightarrow 6 \text{ sec}$

మొత్తం దూరం  $300 \text{ m} \rightarrow ?$   
 $= \frac{300 \times 6}{22.5} = \frac{300 \times 6 \times 10}{225} = 80 \text{ sec.}$

4



25m పరుగువండంలో B అని 2.5 గంతి లింగాలై లింగాదు.

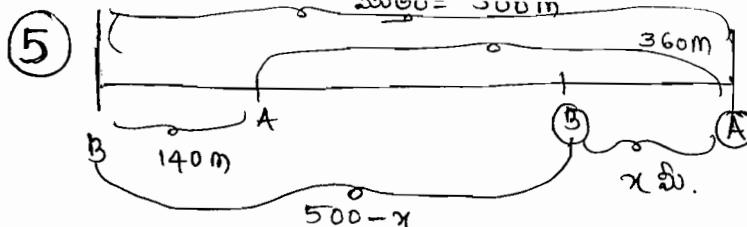


వందంసాధను

25 m  $\rightarrow 2.5$

1000 m  $\rightarrow ?$

$= \frac{1000 \times 2.5}{25} = 100 \text{ m.}$



A నేటింగ్ దూరం. కావున 140m మందు ఫల్చువుంచాడు.

A వందంసాధను = 360m

B వందంసాధను = 500m

A x లీంగ్ అంతర్లు లింగాలై.

A ప్రయాగించిన దూరం  $d_1 = 360$

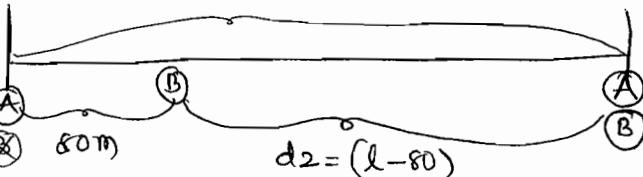
B " " " "  $d_2 = 500 - x$

$\frac{s_1}{s_2} = \frac{d_1}{d_2}$

$\frac{360}{500-x} \Rightarrow 480 = 500 - x$   
 $\Rightarrow x = 20$

6

$d_1 = l$



A, B నేటింగ్ దూరం 80m.

ప్రాథమికమై  $A = \frac{1 \frac{2}{3}}{B}$

$A = \frac{5}{3} B$

ప్రాథమికమై  $\frac{A}{B} = \frac{5}{3}$

$\frac{s_1}{s_2} = \frac{d_1}{d_2} = \frac{5}{3} \times \frac{l}{l-80} \Rightarrow 3l = 5l - 400$

$2l = 400 \Rightarrow l = 200$

7

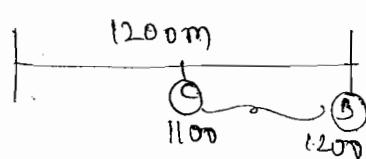
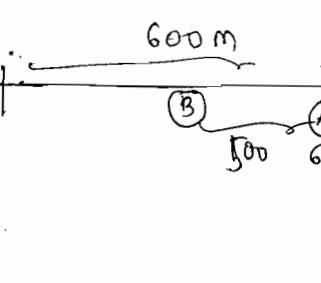
600m పరుగువండంలో A, B ల లింగాలై లింగాలై  
 1200m పరుగువండంలో B, C ల లింగాలై లింగాలై,  
 1800m పరుగువండంలో A, C ల లింగాలై లింగాలై

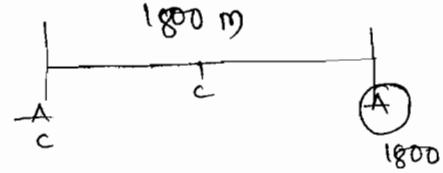
A : B దూరం = 600 : 5500

A : B = 6 : 5

B : C దూరం = 1200 : 1100

B : C = 12 : 11





$$\frac{A}{B} \times \frac{B}{C} = \frac{6}{5} \times \frac{12}{11}$$

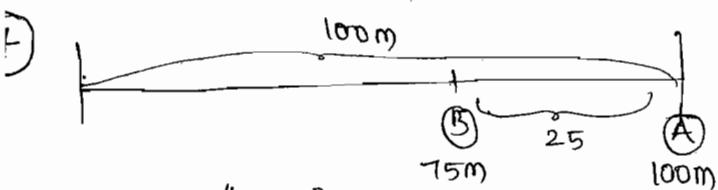
$$\frac{A}{C} = \frac{72}{55} \Rightarrow A:C = 72:55$$

తేడ = 17.

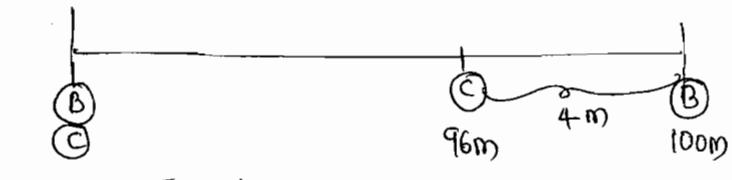
A & C తేడ

$$12 \rightarrow 17 \quad \Rightarrow \quad \frac{100 \times 17}{72} = 25 \times 17 = 425$$

$$1800 \rightarrow ? \quad \Rightarrow \quad \frac{1800 \times 17}{72} = 425$$



$$A:B \text{ ద్వాయం} = \frac{100}{100} : \frac{75}{75} \Rightarrow A:B = 4:3$$



$$B:C = \frac{25}{100} : \frac{24}{96} \Rightarrow B:C = 25:24$$

$$\frac{A}{B} \times \frac{B}{C} = \frac{4}{3} \times \frac{25}{24} = \frac{25}{18}$$

$$A:C = \frac{25}{18} \quad \text{తేడ} = 7 \text{ m}$$

25 m వందంలో A, C ల భిక్షు పరిమాణము.

A & C తేడ

$$\frac{25}{100} \rightarrow 7 \text{ m} \quad \Rightarrow \quad \frac{100 \times 7}{25} = 28 \text{ m}$$

$$100m \rightarrow ? \quad \Rightarrow \quad \frac{100 \times 7}{25} = 28 \text{ m}$$



$$A:B \text{ ద్వాయం} = 100:90$$

$$= 10:9$$

$$B:C = 90:72$$

తేడ = 18 m.

90m ల వరువువందంలో B, C లి 18 start of ఇవ్వాలు

B లి start of ఇవ్వాలి 100m వ్యాపించాలి.

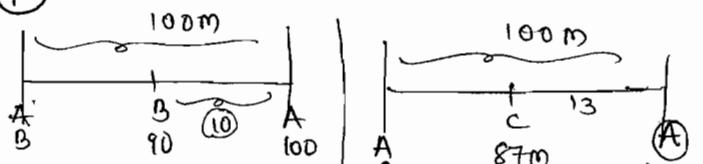


C start of

$$\frac{B}{90} = \frac{18}{18} \Rightarrow 18 \text{ m}$$

$$100m \rightarrow ? \quad \Rightarrow \quad \frac{100 \times 18}{90} = 20 \text{ m}$$

9



$$A:B = 100:90$$

$$A:C \text{ ద్వాయం} = 100:87$$

$$B:C \text{ ద్వాయం} = (90:87) \times 2 \quad \text{అగ్గించాలి}$$

$$= (180:174)$$

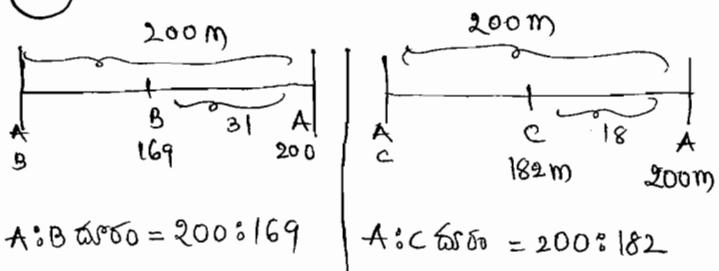
తేడ ↑ 6 రూ. 11.

B, C ల 180 m వందంలో భిక్షు పరిమాణము.

OR

$$\frac{90}{180} \rightarrow 3 \quad \Rightarrow \quad \frac{100 \times 3}{90} = 2 \times 3 = 6 \text{ m.}$$

10

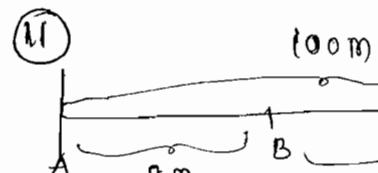


$$A:B \text{ ద్వాయం} = 200:169$$

$$A:C \text{ ద్వాయం} = 200:182$$

$$B:C = 169:182$$

C  
182 → 13  
350 → ? }  $\Rightarrow \frac{50}{\frac{350 \times 13}{180}} = \frac{50}{2} = 25 \text{ m}$



$$A \text{ వీళి} = 54 \text{ h.}$$

$$B \text{ వీళి} = x \text{ h.}$$

పెద్దతం పోడిషు 100 గసమి A లో వ్యాపిస్తామి

$$t_1 = \frac{d}{s} = \frac{100}{5 \times \frac{5}{18}} = \frac{100 \times 18}{25}$$

పెద్దతం పోడిషు 100 గసమి B లో వ్యాపిస్తామి

$$t_2 = \frac{d}{s} = \frac{100}{x \times \frac{5}{18}} = \frac{100 \times 18}{5x}$$

$$t_1 - t_2 = 8 \text{ sec}$$

$$\frac{100 \times 18}{5x} - \frac{100 \times 18}{25x} = 8 \quad (\text{common terms})$$

$$\frac{18}{5} \left( \frac{100}{x} - \frac{100}{25} \right) = 8$$

$$= \frac{100}{x} - \frac{20}{5} = \frac{20}{9}$$

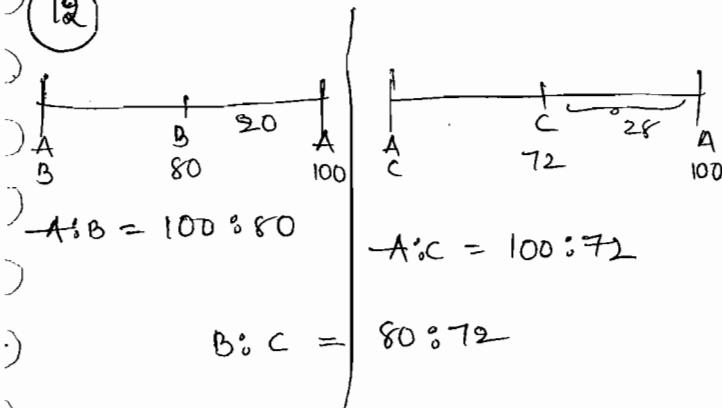
$$= \frac{100}{x} = \frac{20}{9} + 20$$

$$= \frac{100}{x} = \frac{200}{9}$$

$$x = \frac{92 \times 9}{200} = \frac{414}{100} \Rightarrow 4.14 \text{ km/h.}$$



12



$$\frac{B}{80} = \frac{C}{72} \Rightarrow \frac{100 \times 72}{80} = 10 \text{ points.}$$

$$A:B = 60:45$$

$$A:C = 60:40$$

$$B:C = (45:40) \times 2 \quad \text{అంగం } 5$$

$$B:C = 90:80$$

$$\text{అంగం} = 10 \text{ points.}$$

$$\frac{45}{90} = \frac{5}{?} \quad \frac{90 \times 5}{45} = 10 \text{ points.}$$

14 2700 గ్రాముల వెరుగువండిలి A, B, C లో

9శి, 18శి, 27శి, వీరంతి దీహంల్ని తొఱుస్తే?

i) వెరుగువిన్ని చిందువువద్ద కెలస్తే వ్యాపిస్తామి?

ii) బయట్టిగినచోటున ఆవకసింట్టిస్తామి?

11 Ans: ఒకమిల్లిసెంటిమీటర్ల రెలవణిస్తామి

$$t_1 = \frac{d}{s} = \frac{2700 \text{ m}}{9 \times \frac{5}{18}} = 60 \times 18 \Rightarrow 1080 \text{ sec.}$$

$$t_2 = \frac{d}{s} = \frac{2700 \text{ m}}{18 \times \frac{5}{18}} = 540 \text{ sec.}$$

$$t_3 = \frac{d}{s} = \frac{2700 \text{ m}}{18 \times \frac{5}{18}} = 20 \times 18 \Rightarrow 360 \text{ sec.}$$

$$\text{ఓటలు} = [t_1, t_2, t_3]$$

$$\begin{array}{r} 180 \\ 2 \quad | \\ 6 \quad , \quad 3 \quad , \quad 2 \\ 3 \quad | \quad 3 \quad 3 \quad 1 \\ \hline 1 \quad 1 \quad 1 \end{array}$$

$$\Rightarrow 1080 \text{ sec.}$$

11 Ans:

ప్రధాన చిందువువద్ద...

$$\text{భింబించి వ్యాపిస్తామి} = \frac{\text{వ్యతిపెట్టి}}{\text{సంఖ్య}}$$

$$\text{Lcm} \left( \frac{\text{వ్యతిపెట్టి}}{A, B, \text{సంఖ్య}}, \frac{\text{వ్య. ప.}}{B, C, \text{సంఖ్య}}, \frac{\text{వ్య. ప.}}{C, A, \text{సంఖ్య}} \right)$$

$$\text{Lcm} \left( \frac{2700}{9_1 \times \frac{5}{18}_2}, \frac{2700}{9 \times \frac{5}{18}_2}, \frac{2700}{18 \times \frac{5}{18}} \right)$$

$$\text{Lcm} (1080, 1080, 540)$$

$$= 1080 \text{ sec.}$$

# PERCENTAGES

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\* \*

L) సత్త0 =  $x\%$  =  $\frac{x}{100}$

∴ 4 అంది 20 లో ఎంత సత్త0?

$$\frac{\text{అంది}}{\text{ఎందులో}} \times 100 \Rightarrow \frac{4}{20} \times \frac{100}{5} = 20\%$$

Q) 20 అంది 4 లో ఎంత సత్త0?

$$\frac{\text{అంది}}{\text{ఎందులో}} \times 100 \Rightarrow \frac{20}{4} \times 100 = 500\%$$

) 100% 2800 = 2800

100% అనగా మొత్త0 విధవ

$\rightarrow 10\% 2800 = 280$

- Last కు ఈ డిజెం వచ్చియాడ.

$\rightarrow 1\% 2800 = 28$

↳ Last కు 80% డిజెంలను వచ్చితియాడి

100% 1654 = 1654

10% 1654 = 165.4

1% 1654 = 16.54

∴

1. 41% 6200 = 2542

2. 32% 1600 = 512

3. 35% 400 = 140



సత్త0

భాస్య0

$$8.33\% = 8\frac{1}{3}\% = \frac{1}{12}$$

$$12.5\% = 12\frac{1}{2}\% = \frac{1}{8}$$

$$16.66\% = 16\frac{2}{3}\% = \frac{1}{6}$$

$$6.25\% = 6\frac{1}{4}\% = \frac{1}{16}$$

$$11.11\% = 11\frac{1}{9}\% = \frac{1}{9}$$

$$9.09\% = 9\frac{1}{11}\% = \frac{1}{11}$$

$$33.33\% = 33\frac{1}{3}\% = \frac{1}{3}$$

$$66.66\% = 66\frac{2}{3}\% = \frac{2}{3}$$

$$14.28\% = 14\frac{2}{7}\% = \frac{1}{7}$$

$$6.66\% = 6\frac{2}{3}\% = \frac{1}{15}$$

Some Derived Percentages :

(1)  $120\% = \frac{6}{5}$  [  $20\% = \frac{1}{5} \Rightarrow 6(20\%) = \frac{6}{5}$  ]

(2)  $80\% = \frac{4}{5}$

(3)  $60\% = \frac{3}{5}$

(4)  $40\% = \frac{2}{5}$  [  $20\% = \frac{1}{5} + 20\% = \frac{1}{5}$  ]

(5)  $125\% = \frac{5}{4}$

(6)  $150\% = \frac{3}{2}$

(7)  $57.12\% = \frac{4}{7}$ .

(8)  $83.33\% = 100\% - 16.66 = \frac{5}{6}$

(9)  $90.91\% = 100\% - 9.09 = \frac{10}{11}$

(10)  $37.5\% = \frac{3}{8}$

(11)  $62.5\% = \frac{5}{8}$

(12)  $133.33\% = 100\% + 33.33\%$

$$= 1 + \frac{1}{3}$$

$$= \frac{4}{3}$$

) సత్త0

భాస్య0

100%

1

75%

$\frac{3}{4}$

50%

$\frac{1}{2}$

25%

$\frac{1}{4}$

20%

$\frac{1}{5}$

10%

$\frac{1}{10}$

R S Agarwal Bit to Bit by Sagar Sir @Spoorthy Ashok Nagar- 6303450967

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**ARITHMETIC**  
**(R.S. AGGARWAL)**  
**BOOK (BIT TO BIT)**  
 BY  
**ବିଜୟ ନାର୍ଦ୍ଦିତ୍ତ୍ତୁ** Sir,  
 IIT, Kharagpur



**40 Days Batch**  
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**(Study Circle)**

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**6303450967**

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5<sup>th</sup> point:

1.  $a \times b$  = ఖర్చు
2.  $c \times d$  = దొరా
3.  $e \times f$  = ప్రాప్తి
4.  $g \times h$  = వ్యవస్థ
5.  $i \times j$  = Revenue

Model:

1) ఖర్చు | దొరా | ప్రా | వ్యవస్థ | Revenue రాండ్రుల వర్ణా:

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

పోటీ +  
తగ్గి -

2) ఖర్చు | దొరా | ప్రా | వ్యవస్థ | Revenue = సిర్ఫు

చూచినప్పటి మర్కెన్డు తగ్గుతుంది.

" " తగ్గితే " " పోటీతుంది.

$$\text{ఖర్చు} \quad \frac{a}{b} \uparrow \Rightarrow \frac{a}{b+a} \downarrow$$

ఖర్చు  $\frac{a}{b}$  కిమోగు

$$\text{ఖర్చు} \quad \frac{a}{b} \downarrow \Rightarrow \frac{a}{b-a} \uparrow$$

ఖర్చు  $\frac{a}{b}$  కిమోగు.

: Examples:

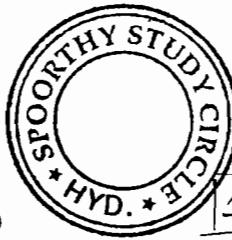
1) ఖర్చు 20% పెరిగి విలయిగు 10% తగ్గినట్టితే ఖర్చులు మార్పు?

2) వ్యవస్థ 20% తగ్గి, వెచుబు 25% పెరిగితే వ్యవస్థలు మార్పు ఎంత?

3) టెక్నిఫ్ ధర 30% ↑, లైట్‌షిల్ సంఘర్షణ 10% ↑ కి మార్పు?

4) వృత్త వ్యాసార్థం 10% తగ్గితే, వ్యవస్థలు మార్పు?

5) చూచినప్పటి ఖర్చు 20% పెరిగి, 10% తగ్గితే, వ్యవస్థలు మార్పు ఎంత? (మళ్ళీ)



6) నీరు వస్తువులు వరుసగా 10%, 20%, 30% తగ్గినట్టి వ్యవస్థలు మార్పులు ఏమియింటి?

Answers

1A:  $a \times b = \text{ఖర్చు}$

$$a+b+\frac{ab}{100} = 20-10 + \frac{20 \times 10}{100}$$

$$= 10-2$$

$$= 8\% \text{ ఖర్చు పెరిగింది.}$$

2A:  $a \times b = \text{వ్యవస్థ}$

$$\text{వ్యవస్థలు} = a+b+\frac{ab}{100}$$

$$= -20+25 + \frac{-20 \times 25}{100}$$

$$= 5-5$$

$$= 0\% (\text{మార్పు లేదు})$$

3A:  $a \times b = \text{Revenue}$

$$\text{Revenue లు} = a+b+\frac{ab}{100}$$

$$= 30+10 + \frac{30 \times 10}{100}$$

$$= 40+3$$

$$= 43\% \uparrow$$

4A:

$$\text{వృత్త వ్యవస్థ} = T \gamma^2$$

$$\gamma = 10\% \downarrow \quad a = -10, b = -10$$

$$\text{వ్యవస్థలు} = a+b+\frac{ab}{100}$$

$$= -10-10 + \frac{-10 \times -10}{100}$$

$$= -20+1$$

$$= -19\% \downarrow$$

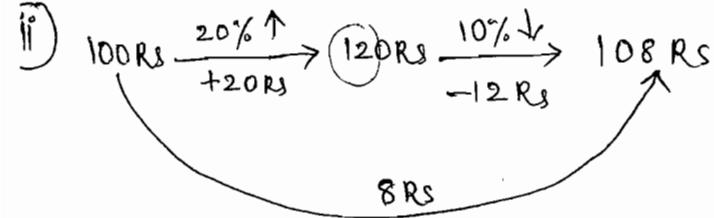
5A:

① వస్తువు ధరలు మార్పు =  $a+b+\frac{ab}{100}$

$$= 20-10 + \frac{20 \times -10}{100}$$

$$= 10-2$$

$$= 8\%$$



$$= \frac{\text{దశా}}{\text{మందుస్తాణి}} \times 100$$

$$= \frac{8}{100} \times 100$$

$$= 8\%$$

iii)  $100\text{Rs} \times \frac{120}{100} \times \frac{90}{100} = 108$

6) - First 3 డిస్కాషన్లను  $\frac{ab}{100}$  formula ద్వారా.

$$100\text{Rs} \xrightarrow{10\% \downarrow} 90 \xrightarrow{20\% \downarrow} 72 \xrightarrow{30\% \downarrow} 50.4$$

$$i) a = -10, b = -20$$

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

$$= -10 - 20 + \frac{-10 \times -20}{100}$$

$$= -30 + 2$$

$$= -28$$

$$a = -28, b = 30$$

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

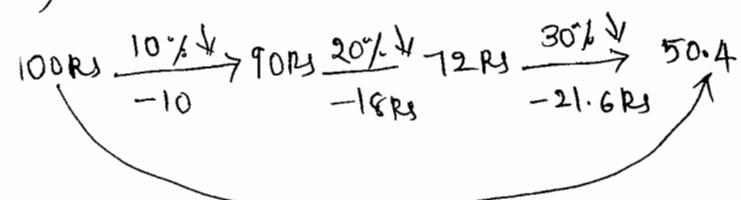
$$= -28 - 30 + \frac{-28 \times -30}{100}$$

$$= -58 + 8.4$$

$$= -49.6$$

Overall Discount = 49.6%

i)



$$100 - 50.4 = 49.6$$

iii)  $100 \times \frac{90}{100} \times \frac{80}{100} \times \frac{70}{100} \Rightarrow 50.4$

$$\text{Discount} = 100 - 50.4 = 49.6\%$$

## Examples

1) ఫర్ 30% పెగితే ఫర్ అవ్వులు విధయిసు ఎంతాలు తెలుచుకోవాల?

2) ఫర్ 14.28% \uparrow ఫర్ అవ్వులు విధయిసు " " తెలుచుకోవాల?

3) ఫర్ 40% \downarrow " " " " ఎవుగుతుంది?

4) ఫర్ 8.33% \downarrow " " " " ఎవుగుతుంది?

5) పొత్తులు 25% \uparrow పెగితే పొత్తులు 50% \uparrow పెగింది. అయితే విషయాల మౌల్యాల కొత్త విలువులను ఎంత?

## Answers

1A:

$$30\% \uparrow = \frac{3}{10} \uparrow \Rightarrow \frac{3}{10+3} \downarrow = \frac{3}{13} \downarrow \Rightarrow \frac{3}{13} \times 100 = \frac{300}{13} = 23\frac{1}{13} \downarrow$$

2A:

$$14.28\% \uparrow = \frac{1}{7} \uparrow \Rightarrow \frac{1}{7+1} \downarrow = \frac{1}{8} \downarrow = 12.5\% \downarrow$$

$$\frac{a}{b} \uparrow \Rightarrow \frac{a}{b+a} \downarrow$$

3A:

$$40\% \downarrow = \frac{2}{5} \downarrow \Rightarrow \frac{2}{5-2} \uparrow = \frac{2}{3} \uparrow$$

$$\Rightarrow \frac{2}{3} \times 100 = 66.66\% \uparrow \text{ విధయిసు}$$

4A:

$$8.33\% \downarrow = \frac{1}{12} \downarrow \Rightarrow \frac{1}{12-1} \uparrow = \frac{1}{11} \uparrow \Rightarrow$$

$$9.09\% \uparrow$$

$$\frac{a}{b} \downarrow \Rightarrow \frac{a}{b-a} \uparrow$$

5A:

$$\text{—} \frac{\text{పొడవు}}{\text{ప్రతిశతము}} = \frac{\text{క్రెడిట్}}{100}$$

$$\begin{aligned} & 100 \times 100 = 10,000 \\ & 125 \times x = 15000 \\ & x = \frac{15000}{125} = 120 \end{aligned}$$

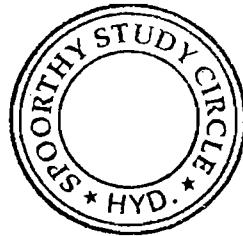
$$\Rightarrow x \times 3\% = 3 \left( a + b + \frac{ab}{100} \right)$$

$$a + b + \frac{ab}{100} = 50$$

$$25 + b + \frac{25b}{100} = 50$$

$$\frac{5b}{4} = 25$$

$$b = 20$$



R.S. Aggarwal Book

$$1) 5:4 \Rightarrow \frac{5}{4} \times 100 = 125\%$$

$$2) 3.5 = 3.5 \times 100 = 350\%$$

$$3) \frac{1\%}{200} = \frac{1}{200} = \frac{0.5}{100} = 0.005.$$

$$4) 15\% \cdot 34 \Rightarrow \begin{array}{r} 10\% = 3.4 \\ 5\% = 1.7 \\ \hline 5.1 \end{array}$$

$$5) 63\% \cdot 3 \frac{4}{7} = \frac{63}{100} \times \frac{25}{7} = 2.25$$

$$= \frac{9}{4} \Rightarrow 2.25$$

$$6) 88\% \cdot 370 + 24\% \cdot 210 - x = 118$$

$$\frac{88}{100} \times 370 + \frac{24}{100} \times 210 - x = 118$$

$$3256 + 504 - 10x = 1180$$

$$3760 - 10x = 1180$$

$$10x = 3760 - 1180$$

$$10x = 2580$$

$$x = 258.$$

$$\begin{array}{r} 3760 \\ - 1180 \\ \hline 2580 \end{array}$$

$$7) 860\%, 50 + 50\%, 860$$

$$= 50\% \cdot 860 + 50\% \cdot 860$$

$$= 100\% \cdot 860$$

$$= 860$$

$$8) 45\% \cdot 750 - 25\% \cdot 480$$

$$= 337.5 - 120$$

$$= 217.5$$

$$9) 40\% \cdot 1640 + x = 35\% \cdot 980 + 150\% \cdot 850$$

$$656 + x = 343 + 1275$$

$$x = 1618 - 656$$

$$x = 962$$

$$10) 218\% \cdot 1674 = x \times 1800$$

$$\frac{218}{100} \times \frac{1674}{100} = x \times \frac{1800}{100}$$

$$\frac{218 \times 93}{100 \times 100}$$

$$x = \frac{20274}{10000}$$

$$= 2.0274$$

11) ఒక వును తాచండిల్లో నెక్కి నున్నాయి.

$$= 60\% \cdot 264$$

$$= (15 \times 4) \% \cdot 264$$

$$= 15\% \quad 4 \times 264$$

$$= 15\% \quad 1056$$

$$\begin{aligned} 2) & \frac{28}{252} \times 100 \\ & \underline{-270} \\ & \quad 3 \\ & = \frac{280}{3} = \\ & = 93 \frac{1}{3}\% . \end{aligned}$$

$$\begin{aligned} 3) & \frac{\text{Sulphur}}{\text{Total}} = \frac{51}{450} \times 100 = \frac{2}{9}\% \\ & \quad \underline{2250} \\ & \quad \quad 450 \\ & \quad \quad \quad 9 \end{aligned}$$

$$4) 18 \text{ gr. ప్రస్తి } 7.2 \text{ kg ను ఎంతాలో?$$

$$= \frac{\text{ప్రస్తి}}{\text{విషయాల్సి}} \times 100$$

$$= \frac{18, \text{gr}}{7200 \text{ gr}} \times 100$$

$$= \frac{1}{4}\% \Rightarrow 0.25\%$$

$$5) 0.01 \text{ ప్రస్తి } 0.1 \text{ లో ఎంతాలో?}$$

$$= \frac{0}{2} \times 100$$

$$= \frac{0.01}{0.1} \times 100$$

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

$$= 10\% .$$

$$6) 1987.5 \text{ లక్షం } 2650 \text{ ఏ. ఎంతాలో?}$$

$$= \frac{0}{2} \times 100$$

$$= \frac{1987.5}{2650} \times 100$$

$$= \frac{1987.5}{265} = \frac{3975}{53} \Rightarrow 75\% .$$

$$17) 3 \text{ గొంతుల రౌషణీ ఎంతాలో?$$

$$= \frac{\frac{3}{8} \times 100}{24} \left( \frac{1}{8} \right)$$

$$= 12.5\% .$$

$$18) 5000 \text{ copies}$$

$$1000 \times 100 \text{ paise} + 4000 \times 98 \text{ paise} .$$

$$= 100000 + 392000$$

$$= 492000 \text{ paise}$$

$$= 4920 \text{ Rs}$$

$$19) \text{ వ్యవస్థా ది Printing ఫర్ = అవు + ఔదా}$$

$$= 25 \text{ Rs} + 2.5 \text{ Rs}$$

$$\text{ఔదా ఫర్} = 27.5 \text{ Rs} .$$

$$\text{ఔదా శతాలో} = \frac{27.5}{25} \times 100$$

$$= \frac{2.5}{27.5} \times 100$$

$$= \frac{1}{11}$$

$$= 9.09\% .$$

$$= 9 \frac{1}{11}\% .$$

$$\approx 9\% .$$

$$20) = 20\% \& 1 \text{ ltrs} \quad (10\% = 0.8)$$

$$= 1.6 \text{ ltrs.}$$

$$21) 6650 \times \frac{94}{100} \times \frac{110}{100}$$

$$= \frac{687610}{100} \Rightarrow 6876.1$$

$$22) \frac{\frac{64}{192}}{\frac{384}{540}} \times 100 = \frac{\frac{71}{640}}{\frac{91}{540}} = 71 \frac{1}{9}\% .$$

$$= \frac{\frac{85}{425}}{\frac{87}{500}} \times 100 = 85\% .$$

$$\frac{570}{700} \times 100 = \frac{570}{7} = 81\frac{3}{7}\%$$

$$\frac{\frac{80}{100}}{\frac{660}{100}} \times 100 = \frac{800}{66} = 8(\frac{100}{11}) = 8(9.09) = 72.72\%$$

$$(23) 5\% 25\% 1600$$

$$= \frac{5}{100} \times \frac{1}{4} \times 1600 \\ = 20$$

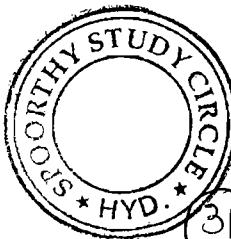
$$(24) 0.15\% 33\frac{1}{3}\% 10,000$$

$$= \frac{0.15}{100} \times \frac{1}{3} \times 10,000 \\ = \frac{15}{300} \Rightarrow 5$$

$$(25) 30\% 28\% 480 \text{ Same as.}$$

$$= 30\% 28\% 2(240)$$

$$= 60\% 28\% 240 \text{ (option B)}$$



$$(26) = 25\% 25\% x$$

$$= \frac{25}{100} \times \frac{25}{100} x$$

$$= \frac{625}{10000} x$$

$$= 0.0625 x$$

$$(27) 3\% \text{ అస్తి } 5\% \text{ అంగుళాతం$$

$$\Rightarrow \frac{\text{అస్తి}}{\text{అంగుళాతం}} \times 100$$

$$= \frac{3x}{5x} \times 100$$

$$= \frac{3}{5} \text{ అస్తి } 60\%.$$

$$(28) 95\% x = 4598$$

$$\frac{95}{100} x = \frac{4598}{20} \quad (\text{19 Table తో వ్యవహరించి})$$

$$x = 4840$$

$$(29) x\% 360 = 129.6$$

$$\frac{x}{100} \times 360 = \frac{129.6}{10}$$

$$x = 36$$

$$(30) x\% 932 + 30 = 309.6$$

$$\frac{x}{100} \times 932 = \frac{2796}{10}$$

$$x = \frac{27960}{932}$$

$$x = 30$$

$$45\% 1500 + 35\% 1700 = x\% 3175$$

$$675 + 595 = \frac{x}{100} \times 3175$$

$$\frac{1270}{254} = \frac{x}{100} \times \frac{3175}{635} \quad (5 \text{ వారం తో)$$

$$x = 40$$

$$(32) 65\% x = 20\% 422.5$$

$$\frac{65}{100} x = \frac{2}{100} \times 422.5$$

$$x = 2 \times 65 \Rightarrow 130$$

$$(33) \text{ అవ్యక్తి} = x \text{ Rs.}$$

$$2.5\% x \text{ Rs} = 12.5 \text{ Rs.}$$

$$\frac{2.5}{100} x = \frac{12.5}{5}$$

$$x = 500 \text{ Rs.}$$

$$34) \quad \cancel{\frac{1}{4}x} = \frac{1400}{2800}$$

$$\frac{3}{7}\% x = 2800$$

$$\frac{21}{7} \times \frac{1}{100} = \frac{1400}{2800}$$

$$x = 980000$$

$$35) \quad 15\% x \% 582 = 17.46$$

$$\cancel{\frac{15}{100}} \times \cancel{\frac{x}{100}} \times \cancel{582} = \frac{1746}{100}$$

$$x = 20$$

$$36) \quad \sqrt{784} + x = 78 \% 500$$

$$28 + x = 390$$

$$x = 362$$

$$37) \quad 20\% \rightarrow 120$$

$$120\% \rightarrow ?$$

$$= \frac{120 \times 120}{20} \Rightarrow 720$$

OR

$$20\% x = 120$$

$$\frac{1}{5} x = 120$$

$$x = 600$$

$$= 120\% 600 [600+60+60=720]$$

$$= 720$$

$$38) \quad \text{ఒక సంఖ్యలో } 35\% 175 \text{ ఉపాన్తి } 175 \text{ లోకి}$$

నుత్తుమి ఈ సంఖ్య నువ్వు ?

$$35\% x = 175$$

$$\frac{35}{100} x = \frac{175}{5}$$

$$x = 500$$

$$4\% 175 = \frac{175}{25} x$$

$$\frac{4}{100} \times \frac{7}{5} = 500$$

$$4 = \frac{2000}{7} = 20 \left( \frac{100}{7} \right)$$

$$= 20(14.28)$$

$$= 2(14.28)$$

$$= 285.6\%$$

39)

$$\frac{2}{5} \times \frac{1}{3} \times \frac{3}{7} x = 15$$

$$x = \frac{15 \times 5 \times 7}{2}$$

$$= 40\% x$$

$$= \frac{2}{5} x \times \frac{15 \times 5 \times 7}{2}$$

$$= 105$$

40)



$$\text{సంఖ్య} = x \quad \frac{2}{5} x$$

$$\text{ఫుదు} = \frac{3}{5} x$$

$$\frac{3}{5} x = 170$$

$$x = 850$$

$$\Rightarrow 10\% x$$

$$= 10\% 850$$

$$= 85$$

41)

$$15\% 40 - 25\% x = 2$$

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

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

$$x = 16$$

: Example Concept:

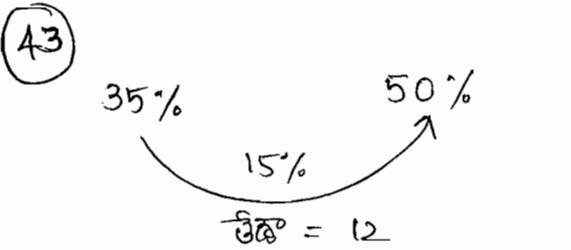
$$\textcircled{42} \quad \left\{ \begin{array}{l} \text{వంటి} - 40\% \text{ వంటి} = 30 \\ (100\%) \end{array} \right.$$

$$60\% x = 30$$

$$\frac{3}{5} \times x = \frac{30}{6}$$

$$x = 50$$

$60\% \rightarrow 30$   
 $100\% \rightarrow ?$

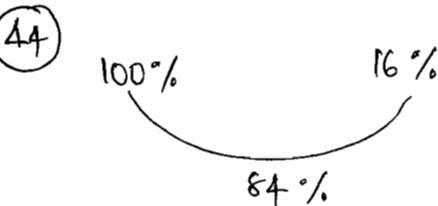


$$15\% x = 12$$

$$\frac{15}{100} x = 12$$

$$x = 80$$

$15\% \rightarrow 12$   
 $100\% \rightarrow ?$



$$84\% x = 42$$

$$\frac{84}{100} x = 42$$

$$x = 50$$



$$\textcircled{46} \quad \left| \begin{array}{l} \frac{4}{5} \times 70 = \frac{5}{7} \times 112 \\ = 56 \qquad \qquad \qquad = 80 \\ = \frac{24}{80} \times 100 \\ = 30\% \downarrow \end{array} \right.$$

$$\textcircled{47} \quad \begin{array}{r} & 137.5 & 125 \\ & \downarrow & \uparrow \\ x & & y \\ 10\% \downarrow & & 10\% \uparrow \\ 137.5 & - & 125 \\ \hline 123.75 & & \end{array} \quad \begin{array}{r} & 137.5 & 125 \\ & \uparrow & \downarrow \\ z & & \\ 10\% \uparrow & & 10\% \downarrow \\ 125 & & 12.5 \\ \hline 137.5 & & \end{array}$$

$$\textcircled{45} \quad 1, 2, 3, \dots, 70 \text{ వంటిలు}$$

విధానవర్ణం చేసే నీవరు '1' వచ్చే సంఘలుసార్తం?

- నీవరు 1, 9 లను వర్ణించే నీవరు 1 వస్తుంది.

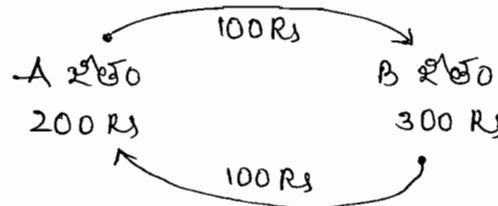
1, 9, 11, 19, 21, 29, 31, 39, 41, 49, 51, 59,

61, 69 ... (ప్రపంచంలో 14 సంఘాలు)

$$\text{సాతం} = \frac{141}{70} \times 100$$

$$= 20\%$$

\textcircled{48}



$$(1) \text{ A తోటి B తోటి వంతుకు వర్ణం} = \frac{100\text{Rs}}{200\text{Rs}} \times \frac{50}{100} = 50\%$$

$$(2) \text{ B తోటి A తోటి వంతుకు గ్రహించు వర్ణం} = \frac{100\text{Rs}}{300\text{Rs}} \times 100 = 33.33\% \downarrow$$

$$\textcircled{48} \quad \begin{array}{r} 25\% \rightarrow 75 \\ 100\%, \rightarrow ? \\ \hline \end{array} \quad \begin{array}{r} = \frac{100}{25} \times 75 \\ = 300 \\ (\text{OR}) \end{array}$$

$$\text{తోటి } 25\% x = 75$$

$$\frac{1}{4} x = 75$$

$$x = 300$$

$$49) \frac{20\%}{(100\%)} = \frac{35}{(80\%)} = 80\%$$

$$\frac{4}{5} \text{ వివిధ} = 80\%$$

$$20\% \rightarrow 35 \\ 80\% \rightarrow ? = \frac{\frac{4}{5} \times 35}{20} = 140$$

$$50) = 100\% + 29.7\% \\ = 129.7\% \\ = \frac{129.7}{100} \\ = 1.297.$$

$$51) -6.5\% x = -8.5\% y \\ \frac{x}{y} = \frac{17}{13} \\ x:y = 17:13.$$

$$\text{రైమ చేసి} = \frac{17}{30} \times 2490 = 1411$$

$$\text{రోడ్ వధి} = \frac{13}{30} \times 2490 = 1079.$$

$$52) x+y = \frac{28}{25} x$$

$$25x+25y = 28x \\ \downarrow \\ 3x = 25y$$

$$\frac{x}{y} = \frac{25}{3}$$

$$x:y = 25:3$$

రుండ్రీల లాయిర్ అనుభి వెదుటిలాయిర్ లాగి ఉత్సత్తా

$$= \frac{3}{25} \times 100$$

$$= \frac{3}{25} \times 100$$

$$= 12\%.$$

$$53) \text{ విషయాల లాయిర్} \quad \text{రోడ్ లాయిర్}$$

$$x \\ y - 25\% x = \frac{5}{6} y \\ y - \frac{5y}{6} = \frac{x}{4} \quad (25\% = \frac{1}{4}) \\ \frac{y}{6} = \frac{x}{4} \\ \frac{x}{y} = \frac{4^2}{6^3} \\ x:y = 2:3$$

$$54) \text{ విషయాల లాయిర్}$$

$$x-y = 20\% x \\ x - \frac{x}{5} = y$$

$$\frac{4x}{5} = y$$

$$\frac{x}{y} = \frac{5}{4}$$

$$x:y = 5:4$$

$$\text{ఎనిమి} 4 \rightarrow 20$$

$$\text{ఎండ్లి} 5 \rightarrow 25$$

$$55) \text{ ప్రాచీన లాయిర్} \quad \text{ప్రాచీన లాయిర్}$$

$$\frac{x}{y} = \frac{4}{1} \\ \frac{x}{y} = \frac{3}{1} \\ x:y = 3:1$$

$$= \frac{2}{1} \times 100$$

$$= 200\%.$$



$$(56) \quad \begin{array}{l} \text{మొదటిసంఖ్య} \\ a \end{array} \quad \begin{array}{l} \text{రోటిసంఖ్య} \\ b \end{array}$$

$$a = 80\% b$$

$$a = \frac{4}{5} b$$

$$a:b = 4:5$$

$4x, 5x$  అన్నానువు.

$$A((4x)^2 + (5x)^2) = 656$$

$$16x^2 + 25x^2 = 164$$

$$4x^2 = 164$$

$$x^2 = 4$$

$$x = 2$$

$$4(a), 5(x) = 4(2), 5(2) = 8, 10$$

(57)

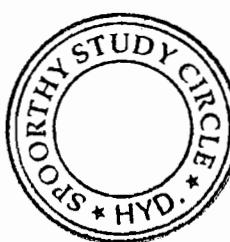
$$5\% A + 4\% B = \frac{2}{3} (6\% A + 8\% B)$$

$$5A + 4B = \frac{2}{3} (6A + 8B)$$

$$15A + 12B = 12A + 16B$$

$$3A = 4B$$

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



(58)

$$\text{మొత్తం లీట్సు} = 1136 + 7636 + 11628 = 20400$$

$$\text{రొగుసవుడు} = \frac{2907}{20400} \times 100 = 14.25\%$$

రొగుసవుడు = 57% లీట్సు రూప్యాలు.

(59)

$$1,75,000 \quad 2,62,500$$

$$\text{తేడు} = 87500$$

$$\begin{aligned} \text{ఇన్ఫోఎచ్చర్సువుల శతం} &= \frac{28500}{50000} \times 100 \\ &= \frac{87500}{175000} \times 100 \\ &= 50\% \end{aligned}$$

$$1\text{ లో} = \frac{50}{100} = 5\%.$$

(60)

Correct

Wrong

జీవితం

$$\frac{5}{3} - \frac{3}{5} = \frac{25-9}{15} = \frac{16}{15}$$

$$\text{జీవితం} = \frac{8750}{\text{Correct}} \times 100$$

$$= \frac{\frac{16}{15}}{\frac{5}{3}} \times 100 \Rightarrow \frac{16}{15} \times \frac{3}{5} \times 100 = 64\% [16 \times 4]$$

$$= 64\% [16 \times 4]$$

(61)

క్రమాల సవుట్ =  $x$  Rs.

$$1.3\% \times \frac{4}{5} x = 910$$

$$\frac{13}{1000} \times \frac{4}{5} x = 910$$

$$x = 35 \times 5 \times 500$$

$$x = 87500$$

(62)

గొధుపండు ద్వారా = 100% అన్నానువు.

$$\begin{array}{l} \text{ప్రిం} \\ 5\% \end{array} \begin{array}{l} \text{15% Loss} \\ \rightarrow 10\% \text{ Loss} \end{array}$$

$$\begin{array}{l} \text{ప్రిం} \\ 30 \text{ Lacks} \end{array} \begin{array}{l} \text{100%} \\ \rightarrow 40 \text{ Lacks} \end{array} \begin{array}{l} \text{ప్రిం} \\ 10 \text{ Lacks} \end{array}$$

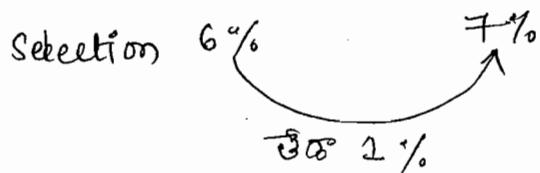
$$5\% \rightarrow 10 \text{ Lacks}$$

$$100\% \rightarrow ?$$

$$\frac{100 \times 10}{5} = 200 \text{ Lakh Tonns.}$$

3)  $\frac{920}{100} \rightarrow A \quad 100\%$

$\frac{920}{100} \rightarrow B \quad 100\%$



1%  $\rightarrow 80$   
100%  $\rightarrow ? = 8000$   $\left[ \frac{100 \times 80}{1} \right]$

4)  $\frac{\text{ప్రస్తావిత} \times \text{measure} \times \text{ప్రశ్నిలు}}{3,25,000 \times \frac{85}{100} \times \frac{90}{100}} = 248625$

$$\begin{array}{r} 325,000 \\ - 248625 \\ \hline \cancel{76375} \\ \times 76375 \end{array}$$



5)  $25 \text{ RS}$

Taxable	$x \text{ RS}$	$= 25 - 5.30$
$6\% x \text{ RS} = 30\%$	$\frac{6}{100} \times x \text{ RS} = \frac{30}{100}$	
$x = 5 \text{ RS}$		
Taxable $\rightarrow 5 \text{ RS}$	$\text{tax} = 30\%$	
$\underline{5.30 \text{ RS}}$		

6)  $\text{fours} = 3 \times 4 = 12 \text{ Runs}$   
 $\text{sixes} = 8 \times 6 = 48 \text{ Runs}$   
 $\underline{60 \text{ Runs}}$

$\text{మొత్త} = \frac{110}{60} \times 100 \Rightarrow \frac{50}{11} \Rightarrow 45\frac{5}{11}\%$ .

7)  $95\% x = 9595$   
 $\frac{95}{100} x = \frac{9595}{100}$   
 $x = 10100$

8)  $100\% - 40\% = 60\%$

$60\% \rightarrow 420$   
 $100\% \rightarrow ? \rightarrow \frac{100 \times 420}{60} = 700$

9)  $100\% \text{ నంపాదన}$

$\frac{1}{3}$	$66\frac{2}{3}\% = \frac{2}{3}$	$\frac{2}{3}$
$\frac{2}{3}$	$33\frac{1}{3}\% = \frac{1}{3}$	

$\frac{1}{3} \rightarrow 1200$   
 $\frac{2}{3} \rightarrow 2400$

10)  $100\% \rightarrow \text{మొత్త}$

$35\%$	$100\%$	$65\%$
వాస్తవ		తప్పాలు.

$65\% \rightarrow 455$   
 $100\% \rightarrow ? = \frac{100 \times 455}{65} = 700$

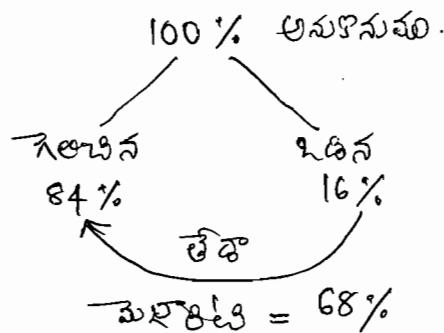
11)  $100\% \text{ అస్తిస్తవం}$

$\downarrow$	$\downarrow$	$\downarrow$
A 20%	B 60%	అస్తిత్వం 20%
		తేడ 40%

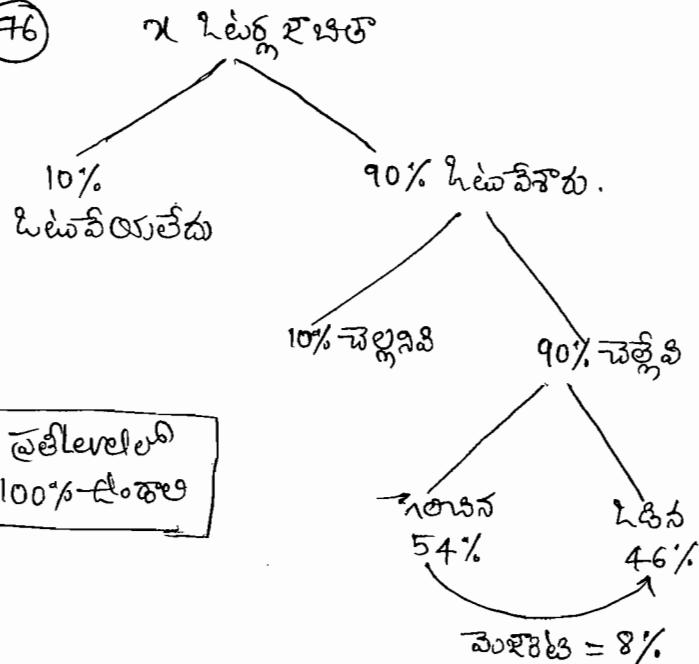
$40\% \rightarrow 720$   
 $100\% \rightarrow ? = \frac{100 \times 720}{40} = 1800$

12) వ్యాపార అవకాశ  $= 125 + 40 = 165$   
 $33\% \rightarrow 165$   
 $100\% \rightarrow ? = \frac{100 \times 165}{33} = 500$

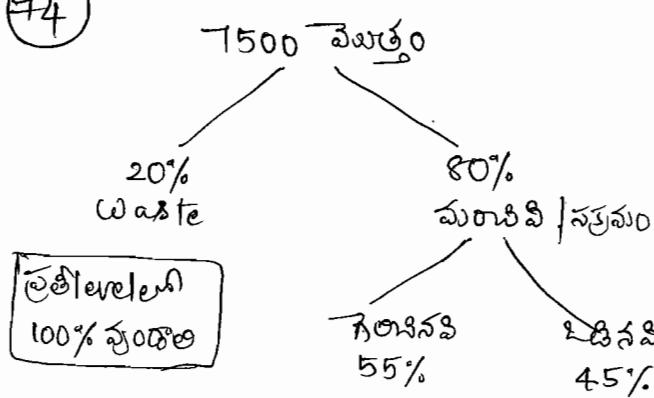
73



76



74

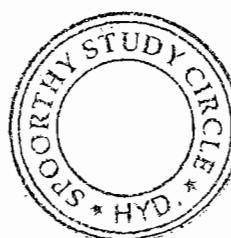


$$= 45\% \times 80\% \times 1500$$

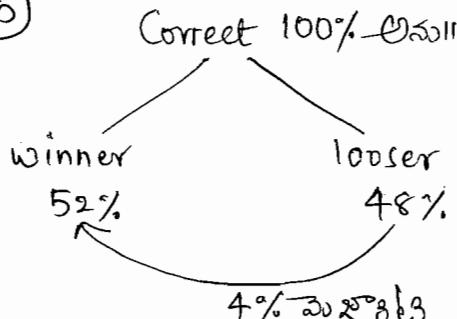
$$= \frac{45}{100} \times \frac{4}{5} \times \frac{15}{8} \times 1500$$

$$= 45 \times 60$$

$$= 2700$$



75

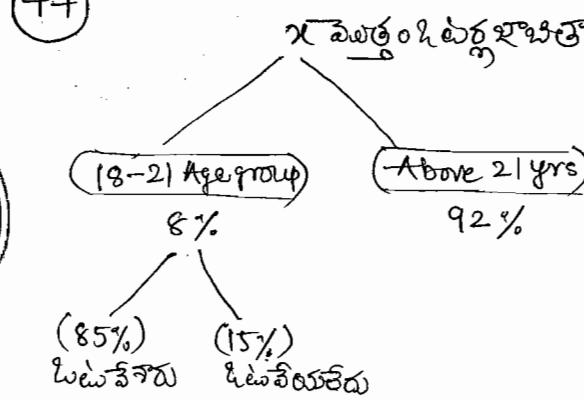


$$4\% \rightarrow 98$$

$$100\% \rightarrow ? \quad \frac{100 \times 98}{4} = 2450$$

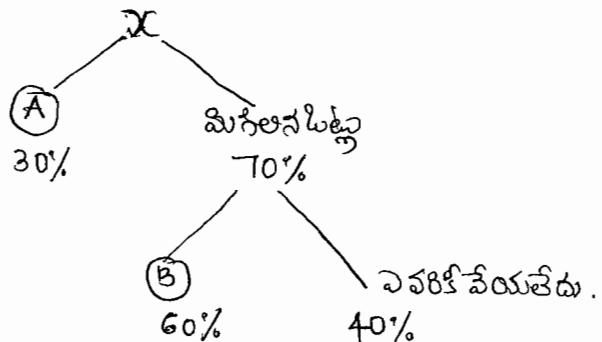
$$\begin{aligned} \text{Polled notes} &= \text{Correct} + \text{Waste} \\ &= 2450 + 68 \\ &= 2518 \end{aligned}$$

77



$$\begin{aligned} \frac{\text{దిండవిలులు}}{\text{వెంతు}} \times 100 &= \frac{85\% \times 8\% \times x}{x} \times 100 \\ &= \frac{85 \times \frac{8}{100} \times x}{x} \times 100 \\ &= 6.8\% \end{aligned}$$

78



$$\text{విజ్ఞానికి} = 40\% + 70\% \cdot x$$

$$= \frac{40}{100} \times \frac{70}{100} \times x = 0.28x$$

$$\text{అంతిమికి} = 30\% \cdot x = 0.3x$$

$$\text{లేడి} = 0.3x - 0.28x = 1200$$

$$0.02x = 1200$$

$$\frac{x}{100} \times \frac{600}{100} = 1200$$

$$x = 60,000$$

(79)  $x = 120\% y$

$$x = \frac{6}{5} y$$

$$\frac{x}{y} = \frac{6}{5}$$

$$x:y = 6:5$$

$$x = \frac{6}{11} \times 550 = 300$$

$$y = \frac{5}{11} \times 550 = 250$$



(80)  $\text{విత్రం+tax} = 1\% 400 + 9\% 6400$   
 $= 28 + 576 \Rightarrow 604$

$$\text{విత్రం మొత్తం} = 400 + 6400 = 6800$$

$$\text{నొత్తం} = \frac{151}{604} \times 100 = \frac{151}{17} \Rightarrow 8\frac{15}{17}\%$$

(81)  $100 + 150 + 200 = 450$   
 $90\% \quad 60\% \quad 54\%$

$$\begin{aligned} \text{Score} &= 90 + 90 + 108 = 288 \\ &= \frac{288}{450} \times 100 \\ &= 64\% \end{aligned}$$

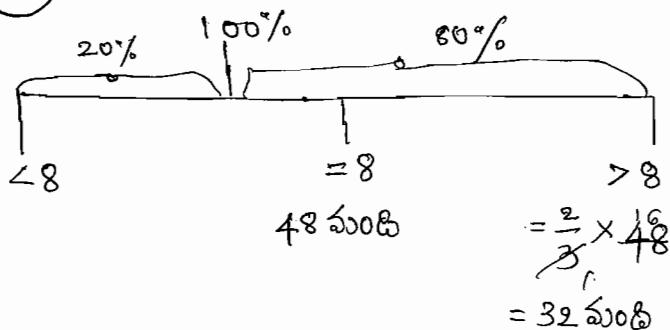
(82)

Boys	Girls
1100	700
Pass	Pass
42%	30%
Fail	Fail
58%	70%
$Fail = 58\% \times 1100$	$Fail = 70\% \times 700$
$= 638$	$= 490$

$$\text{మొత్తం fail} = 638 + 490 = 1128.$$

$$\begin{aligned} &= \frac{188}{1800} \times 100 \\ &= \frac{62}{3}\% \end{aligned}$$

(83)

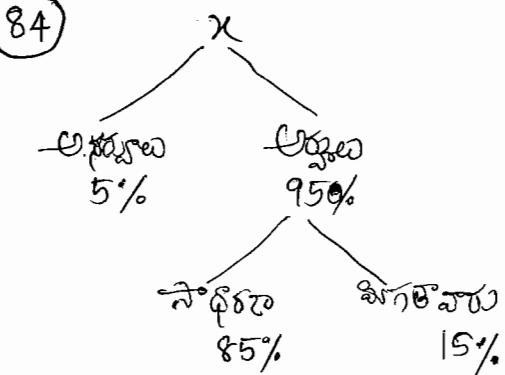


$$\text{మొత్తం} = 48 + 32 = 80 \text{ వంది}$$

$$80\% \rightarrow 80$$

$$100\% \rightarrow ? \text{ 100 వంది.}$$

(84)



$$15\% 95\% x = 4275$$

$$\frac{15}{100} \times \frac{95}{100} \times x = 4275$$

$$x = 30000$$

(85) ముదుంవడు రెండోవడు ప్రశ్నల వర్ణనలు

$$x+9 \quad x \quad 2x+9$$

$$\frac{x+9}{(33+9=42)} = 56\% \text{ (ఇద్దనిష్టము)}$$

$$x+9 = \frac{14}{100} (2x+9)$$

$$25x+225 = 28x+126$$

$$(-) \quad (-)$$

$$3x = 99$$

$$x = 33$$

(86)  $x = 90\% y$

$$x = \frac{90}{100} y$$

$$y = \frac{10}{9} x$$

$$y = \frac{10}{9} \times 100 x \Rightarrow \frac{1000}{9} x \Rightarrow 111\frac{1}{9}\% x$$



(87)  $a \% b = b \% a$

(88)  $b = 20\% a$

$$b = \frac{20}{100} a$$

$$b = \frac{a}{5}$$

$$= b \% 20$$

$$= \frac{b}{100} \times 20$$

$$= \frac{b}{5}$$

$$\frac{a/5}{5} = \frac{a}{25}$$

option a  $= 4\% a$

$$= \frac{4}{100} \times a$$

$$= \frac{a}{25}$$

OR

$$20\% a = b$$

$$\frac{1}{5} a = b$$

$$\frac{a}{b} = \frac{5}{1}$$

$$a:b = 5:1$$

$$b \% 20 = x \% a$$

$$1 \times \frac{4}{20} = x \times \frac{1}{5}$$

$$x = 4$$

(89)  $x \% y = \frac{4}{5} \times \frac{16}{80}$

$$\frac{xy}{100} = 64$$

$$xy = 6400$$

(90)  $x \% y = 100$

$$\frac{xy}{100} = 100$$

$$\frac{yz}{100} = 200$$

$$\frac{yz}{100} = 2 \times 100$$

$$\frac{yz}{100} = 2 \times \frac{xy}{100}$$

$$z = 2x$$

(91)  $p \% p = 36$

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

$$p^2 = 3600$$

$$p = 60$$

(92)  $x \% y = z$

$$\frac{xy}{100} = z$$

$$\frac{a}{100} \times \frac{xy}{100} = x$$

$$a = \frac{10000}{y}$$

$$a = \frac{(100)^2}{y}$$

(93)  $x = 80\% y$

$$x = \frac{4}{5} y$$

$$x:y = 4:5$$

$$a \% 2x = y$$

$$\frac{a}{100} \times 2 \times \frac{4}{5} = 5$$

$$a = \frac{125}{2}$$

$$a = 62\frac{1}{2}$$

(94)  $100\% - 6\% = 94\%$

$$94\% = \frac{94}{100} = 0.94$$

$$\begin{aligned}
 95) &= x\%y + y\%x \\
 &= x\%y + x\%y \\
 &= 2x\%y \\
 &= 2\%xy
 \end{aligned}$$

$$\begin{aligned}
 96) A &= 150\%B & B \text{ అంటు } A+B \text{ ఏంతు కొత్త} \\
 A &= \frac{3}{2}B & \frac{2}{5} \times 100\% \Rightarrow 40\% \\
 A:B &= 3:2
 \end{aligned}$$

$$\begin{aligned}
 97) \frac{2}{5}\%x &= \frac{1}{4}\%y \\
 2\%x &= 1\%y \\
 \text{ఇరుక్కులు '10' తో గుండించండి.} \\
 20\%x &= 10\%y
 \end{aligned}$$

$$\begin{aligned}
 98) 20\%A &= B & 40\%B &= C \\
 \frac{A}{5} &= B & \frac{2}{5}B &= C \\
 A:B &= 5:1 & B:C &= 5:2 \\
 \cancel{A:B} &= \cancel{5:1} \\
 B:C &= \cancel{5:2}
 \end{aligned}$$


---


$$A:B:C = 25:5:2$$

$$\begin{aligned}
 60\% (A+B) &= x\%C \\
 60(25+5) &= x \times 2 \\
 x &= 900\%C
 \end{aligned}$$

$$\begin{aligned}
 99) x\%a &= y\%b \\
 xa &= yb \\
 b &= \frac{xa}{y} \\
 &= \frac{xz}{y}\%a.
 \end{aligned}$$

100) దిండాలు Answer.

$$101) 33\frac{1}{3}\%A = 50\%B$$

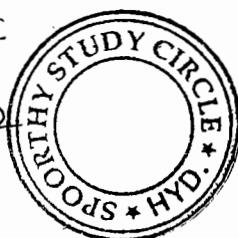
$$\frac{A}{3} = \frac{B}{2}$$

$$A:B = 3:2$$

$$\begin{aligned}
 2 &\rightarrow 1500 \\
 3 &\rightarrow ? = \frac{3 \times 1500}{2} = 2250
 \end{aligned}$$

Directions for (Questions 102 to 106):

City	నగరవాటిక సార్ట (I)	ఒట్టేడు మంత్రపాట ఎష్ట్ (II)
P	75% 18000	25% 6000
Q	80% 14000	20% 3500
R	60% 4500	40% 3000
S	55% 3300	45% 2700
T	25% 1400	75% 4200



మొత్తం వుంది
P - 24000
Q - 17500
R - 7500
Q - 6000
T - 5600

102) Answer T - 5600 వుండి నచ్చు లుతున్నారు.

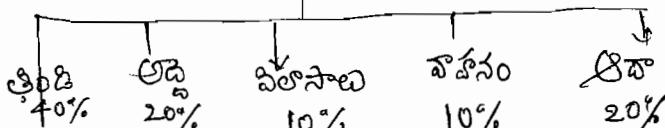
103) Answer - P - 18,000 వుంది.

104) Answer - 24000 (P)

105) Answer - 14000

106) Answer - 41200

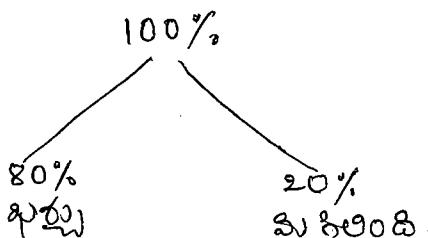
107) 100% లిపుగుపు



$$20\% \rightarrow 1500$$

$$100\% \rightarrow ? = \frac{500 \times 1500}{20\%} = 7500$$

108



$$\text{శుభినంద} = 35000$$

$$\begin{array}{r} \text{రంగుత్రయ} = 40000 \\ \hline 75000 \end{array}$$

$$80\% \rightarrow 75000$$

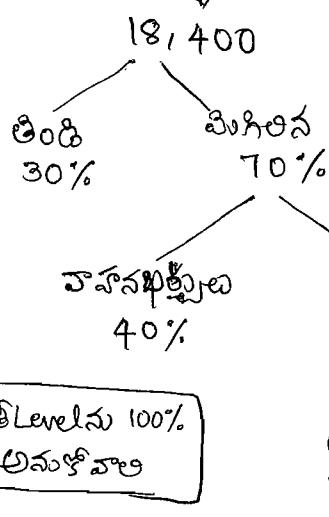
$$100\% \rightarrow ? = \frac{5}{100} \times 75000$$

$$= 18750 \times 5$$

$$= 93750$$

109

ముత్తు జాతి



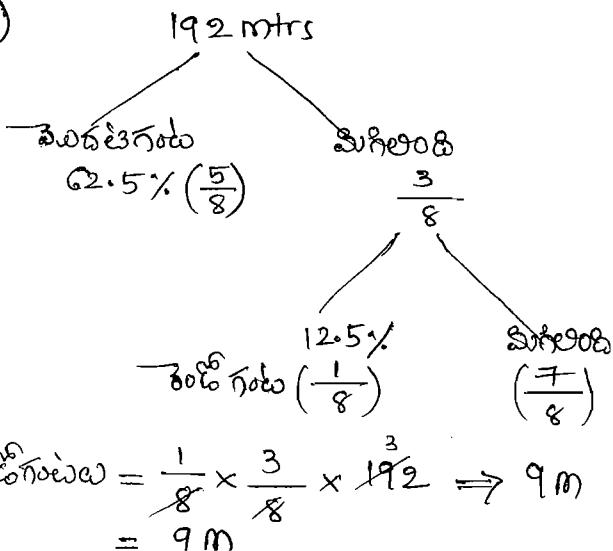
$$\text{తల్లి Level} = 100\% \text{ అస్టోలో$$

$$= 50\% \times 60\% \times 70\% \times 18400$$

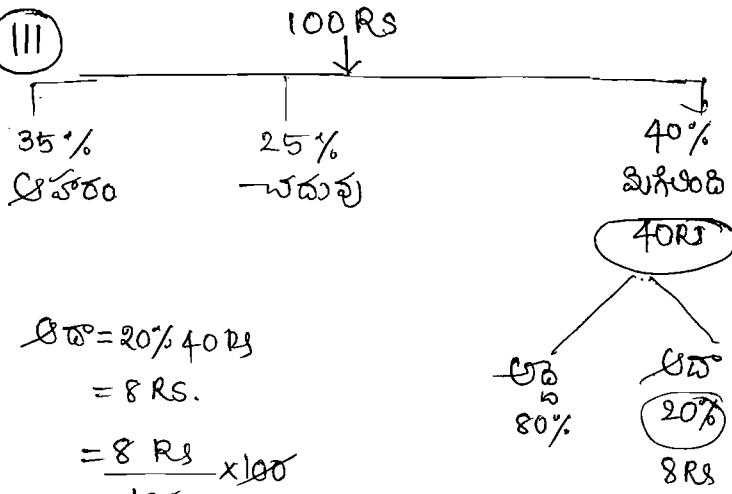
$$= \frac{1}{2} \times \frac{3}{5} \times \frac{7}{10} \times 18400$$

$$= 3864$$

110



111



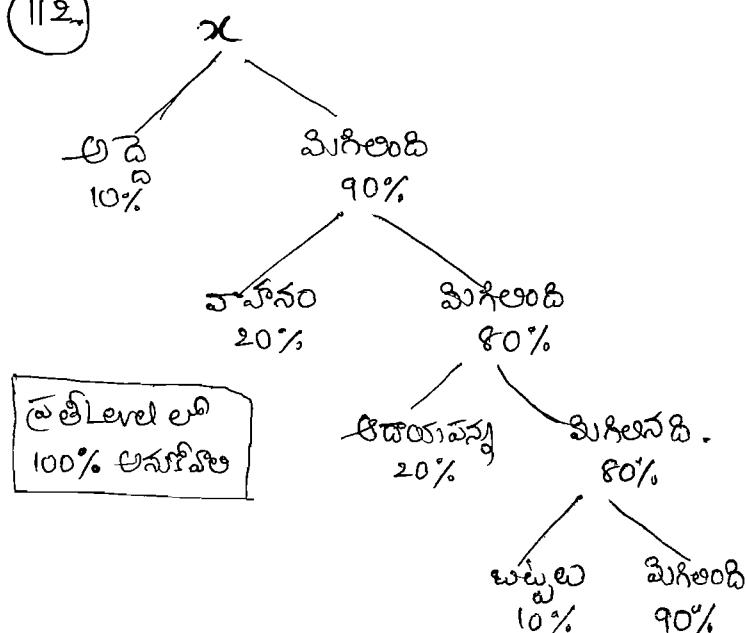
$$\text{అద్ద} = 20\% \text{ of } 40 \text{ RS}$$

$$= 8 \text{ RS.}$$

$$= \frac{8 \text{ RS}}{100} \times 100$$

$$= 8\%$$

112



తల్లి Level లో  
100% అస్టోలో

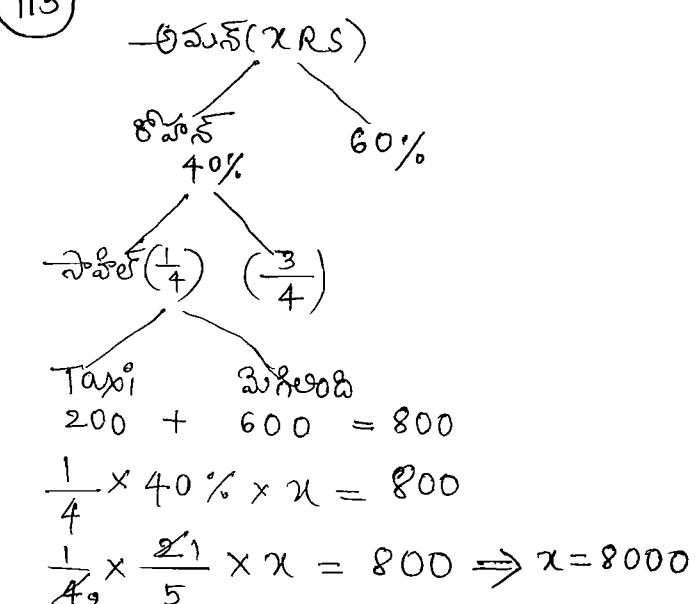
$$90\% \times 80\% \times 80\% \times 90\% \times x = 15552$$

$$\frac{9}{10} \times \frac{4}{5} \times \frac{4}{5} \times \frac{9}{10} \times x = 15552$$

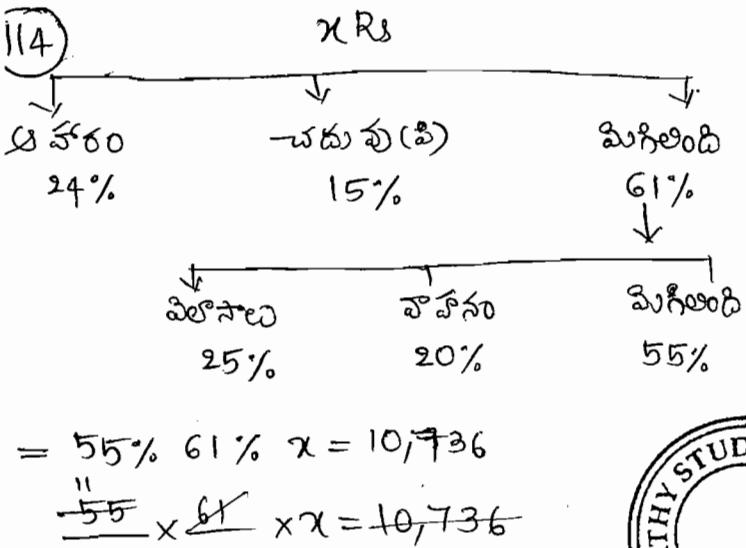
$$x = 12 \times 2500$$

$$x = 30,000$$

113



114



117

$$\begin{array}{c} n \\ \swarrow \quad \searrow \\ 20 \text{ Que} \quad (n-20) \text{ Q} \\ \text{Correct} - 15 \text{ Q} \end{array}$$

$$\frac{1}{3} \text{ వంతు}$$

$$15 + \frac{1}{3}(n-20) = 50\% n$$

$$\frac{45+n-20}{3} = \frac{n}{2}$$

$$\frac{n+25}{3} \times \frac{n-20}{2}$$

$$2n+50 = 3n$$

$$n = 50$$



115

మొత్తం ల్లటి  $\times$  అతీంబున్ని లభించే స్విట్చు = ల్లటి

$$x$$

నంభిలి 20%

$$= 20\% x$$

$$= \frac{1}{5} x$$

మొత్తం ల్లటి  $\times$  అతీంబున్ని ల్లటి = మొత్తం స్విట్చు

$$x \times \frac{x}{5} = 405$$

$$x^2 = 5 \times 405$$

$$x^2 = 5 \times 5 \times 81$$

$$x = 5 \times 9$$

$$x = 45$$

$$\text{ల్లటి స్విట్చు} = \frac{x}{5} = \frac{45}{5} = x = 9$$

116

మొత్తం విద్యార్థిలు = 150

Boys + Girls = 150

$$x + x\% 150 = 150$$

$$x + \frac{3}{2}x = 150$$

$$\frac{5x}{2} = 150$$

విటి  $x = 60$  మాసి.

118

$$A + B = 200$$

$$\begin{array}{cc} A & B \\ \text{ఫర్} & 95\% & 85\% \\ \text{సద} & 5\% & 15\% \end{array}$$

$$5\% A = \frac{15}{3}\% B$$

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

$$A : B = 3 : 1$$

$$A \text{ శాతం} = \frac{3}{4} \times \frac{500}{1} = 1500$$

119

మొత్తం =  $x$  పరువులు

$\downarrow$

Biology	maths	Drawing
$25\% x - 20$	$y$	50

$$25\% x - 20 + y + 50 = x$$

కెన్సిన్ రోడు చరిత్రాల ద్రోగ్ క్లింష్ రూపులు.

నవ్వరణల నుండి వుక్కలను (cannot be determined) - Answer.

120

$x$  sales

$$\begin{array}{cc} 10,000 & x-10,000 \\ 5.5\% & 6\% \end{array}$$

$$5.5\% 10,000 + 6\% (x - 10,000) = 1990$$

$$550 + 6\% x - 600 = 1990$$

$$6\% x = 1990 + 50$$

$$\frac{6}{100} x = \frac{340}{20}$$

$$x = 34000$$

121

	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
max. marks	- 150	150	180
Score	- 62	35	x

మొత్తం వీడు = 35% pass ల్లివుతాడు.

$$\text{మొత్తం వోటాలు} = 150 + 150 + 180 = 480$$

$$= 35\% 480 \quad \frac{144}{168}$$

$$= 168$$

$$\text{కుట్టసమయాలు} = 62 + 35 + x = 168$$

$$= 97 + x = 168$$

$$x = 71$$

122

$$100\%, \rightarrow \text{సహసర మార్కాలు} = 80$$



	10%	20%	70%
95 మార్కాలు	90 మార్కాలు	x మార్కాలు	

$$\text{సహసర} = \frac{n_1 x_1 + n_2 x_2 + n_3 x_3}{n_1 + n_2 + n_3}$$

$$n_1 : n_2 : n_3 = 10 : 20 : 70 = 1 : 2 : 7$$

$$80 = \frac{1 \times 95 + 2 \times 90 + 7 \times x}{1+2+7}$$

$$\text{మొత్తం} - 100 \times 80 = 8000$$

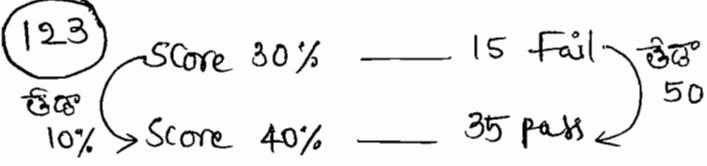
$$1^{\text{st}} - 10 \times 95 = 950$$

$$2^{\text{nd}} - 20 \times 90 = 1800$$

$$= 5250$$

$$70 \times x = 5250$$

$$x = 75.$$



$$10\% \rightarrow 50$$

$$\text{గొప్ప} - 100\% \rightarrow ? = 500 \text{ మార్కాలు.}$$

$$= 30\% 500$$

$$= 150$$

15 మార్కాలతో fail చెందుకు.

$$\text{మొత్తం} = 150 + 15 = 165$$

$$= \frac{33}{100} \times 100 \\ = 33\%$$

124

$t - c = 400$	$6t + 6c = 4800$
	$6(t+c) = 4800$

$$+ \begin{array}{r} t - c = 400 \\ t + c = 800 \\ \hline 2t = 1200 \end{array}$$

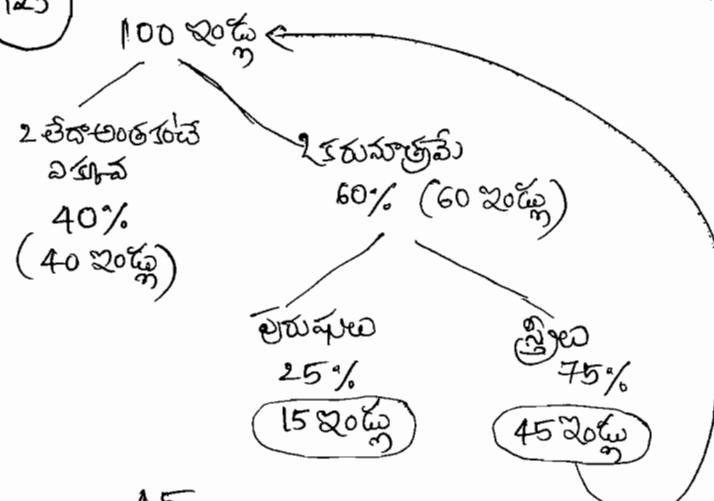
$$t = 600$$

$$600 - c = 400 \quad 400 \text{ రూ తిథిక} \\ c = 200$$

$$= \frac{2}{3} \times 100 \left( \frac{200}{3} = \frac{2}{3} \right)$$

$$= 66.66\%$$

125



$$= \frac{45}{100} \times 100$$

$$= 45 \text{ శంక్షిలు.}$$

126

(100వంది) 100% అస్కులువు

చదువు X

40%

40 మంది

చదువు V

60%

60 మంది



$$\text{తెప్పిన (Fail) ఫలారో = } \frac{3}{8} \times \frac{3}{8} \times x = 34\frac{3}{8}$$

$$x = 38 \times 8 \times 8$$

$$\begin{aligned}\text{ప్రవసంబిలు = } & \frac{1}{4} \times \frac{5}{8} \times x \\ & = \frac{1}{4} \times \frac{5}{8} \times 38 \times 8 \times 8 \\ & = 380\end{aligned}$$

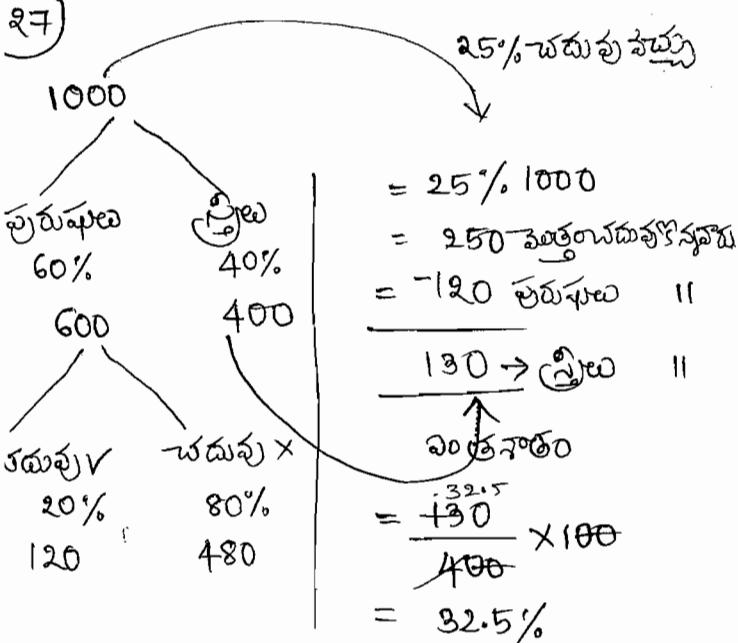
100 మంది (100%) అస్కులువు

భీధవారు  
60% (60 మంది)ధృవంతుయ  
40% (40 మంది)చదువు X  
(10%)  
4 మందిచదువు V  
(90%)  
36 మంది.చదువుల ధృవంతుయ  $\textcircled{10}-4 \rightarrow \textcircled{15}$  మందిచదువుల భీధవారు =  $40 - 4 = 36$  మంది

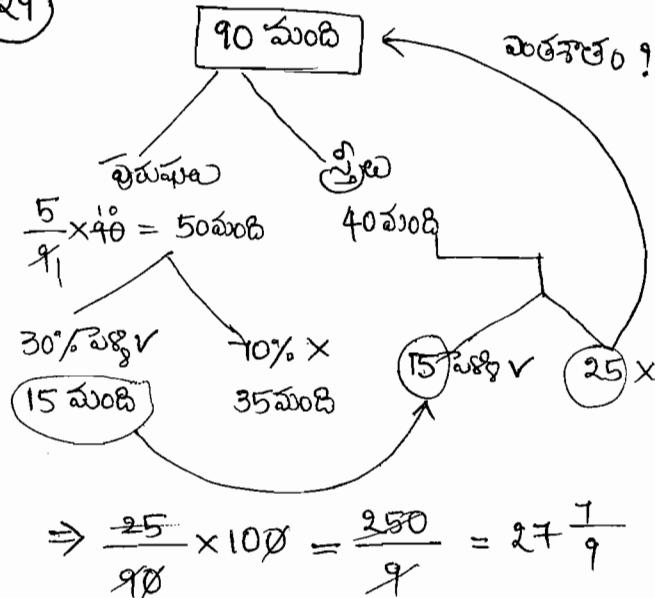
చదువుల వారు భీధశిల్పిలు ఎంతారు?

$$= \frac{36}{60} \times 100 \Rightarrow 60\%.$$

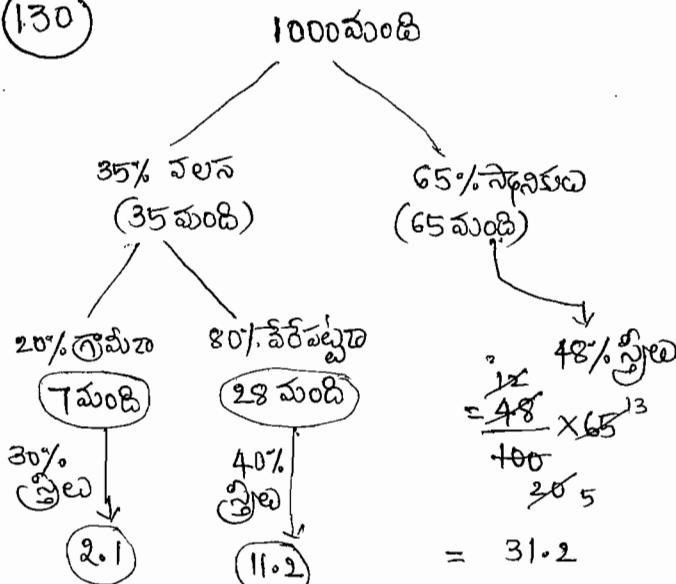
127



129

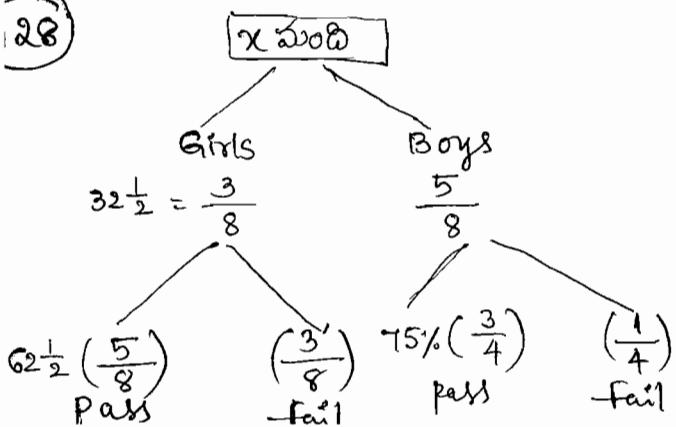


130



$$\text{ప్రపంచ ప్రీయ} = 2.1 + 11.2 + 31.2 = 44.5$$

128

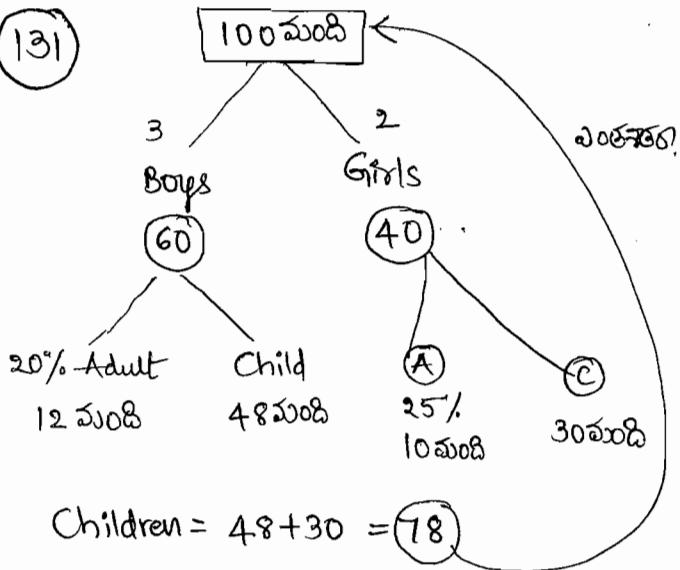


$$100 \rightarrow 728400$$

$$44.5 \rightarrow ? = \frac{44.5 \times 728400}{100}$$

$$= 324138$$

(131)



(134)

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

$$a = -25$$

$$b = 20$$

$$= -25+20+\frac{-25 \times 20}{100}$$

$$= -5-5$$

$$= -10$$

$$= 10\% \text{ decreased}$$

(135)

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

$$a = 15$$

$$b = -15$$

$$= 15-15+\frac{15 \times -15}{100}$$

$$= -2.25\%$$

$$2.25\% \text{ తగ్గింది.}$$

(132)

$$\text{సలసంత్రమ్భ} = x \text{ Rs}$$

$$12.5 = \frac{1}{8}$$

$$\text{సాలిట్} = 12x \text{ Rs}$$

$$12x - \frac{1}{8} \times 12x = 1660$$

సాలిట్                    సాలవరువ్వుతులాల్చు                    సాలిపర్ము

$$= 10\% 5,00,000$$

$$= 12x \times \frac{1}{8} = 50000 + 1660$$

$$= 12x \times \frac{1}{8} = 51660$$

$$x = 4920$$

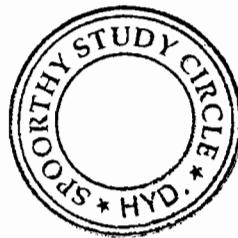
(133)

100x  
87x

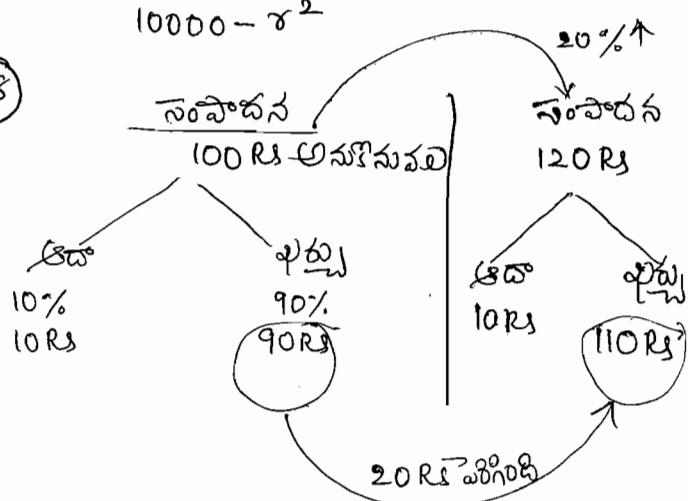
20%  
20x  
80%  
80x

కెప్పిన లాలు  
80x + 42Rs = 87x

$x = 6$



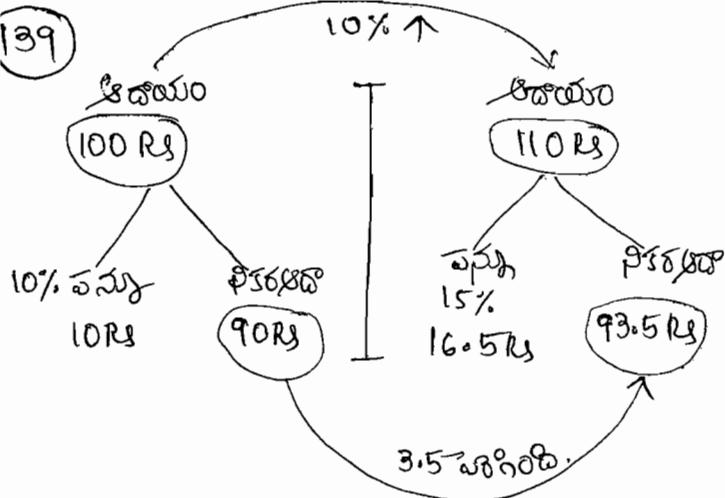
(138)



$$\text{సత్త} = \frac{20}{90} \times 100$$

$$= \frac{200}{90} \Rightarrow 22.\underline{2}$$

139



$$\begin{aligned} 3.5 \times 100 &\rightarrow 350 \text{ Rs} \\ 100 \times 100 &\rightarrow 10,000 \end{aligned}$$

140

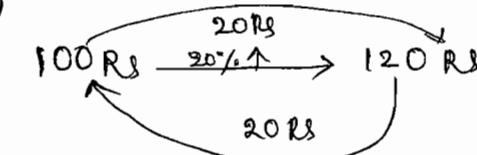
$$\begin{array}{ll} 2000 \text{ లక్ష } & 2002 \text{ లక్ష } \\ \rightarrow \text{పెరుగుది } (100\%) \times & (100\%) \times -5000 \\ \text{రాఫ్టరీ } & 20\% \\ \text{ఖదోయి } & 120\% x = 126\% (x - 5000) \end{array}$$

$$120\% x = 126\% (x - 5000)$$

$$6\% x = 126\% \cancel{5000}$$

$$x = 105000$$

141



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

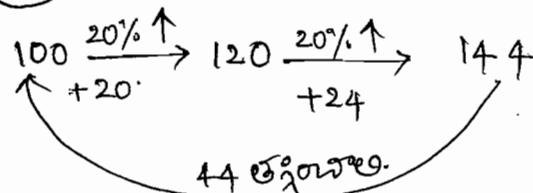
$$= 16 \frac{2}{3}\% \downarrow \quad \text{OR} \quad 16.66\% \downarrow$$

OR

$$\frac{a}{b} \uparrow \rightarrow \frac{a}{b+a} \downarrow$$

$$20\% \uparrow = \frac{1}{5} \uparrow \rightarrow \frac{1}{5+1} \downarrow = \frac{1}{6} \downarrow = 16 \frac{2}{3}\% \downarrow$$

142



44 అనేది 144 లో ఎవరుతో?

$$= \frac{44}{144} \times 100$$

$$= \frac{275}{9} \Rightarrow 30 \frac{5}{9}$$

143

$$\begin{array}{l} \text{ధర} \times \text{అవ్యక్తి} = \text{ఖదోయి} \\ 25\% \downarrow \quad 20\% \uparrow \\ a = -25 \quad b = 20 \end{array}$$

$$\begin{aligned} \text{ఖదోయించి వ్యక్తి} &= a+b+\frac{ab}{100} \\ &= -25+20-\frac{-25 \times 20}{100} \\ &= -5-5 \\ &= -10 \\ &= 10 \text{ స్కోర్ అంగ్యాంగి.} \end{aligned}$$

144

$$\text{ధర} \times \text{వినియోగం} = \text{ధర} \cdot \left( a+b+\frac{ab}{100} \right)$$

$$20\% \uparrow \quad 20\% \downarrow =$$

$$a = 20 \quad b = -20$$

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

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

$$= -4$$

అను ధర్మి = 4\% \downarrow \text{అంగ్యాంగిశన్నాయి.}

145

$$\text{ప్రత్యేకించి ధర} \times \text{బంతి వించిత్తులు} = \text{అంగ్యాంగి}$$

$$20\% \downarrow$$

$$a = -25 \quad b = x$$

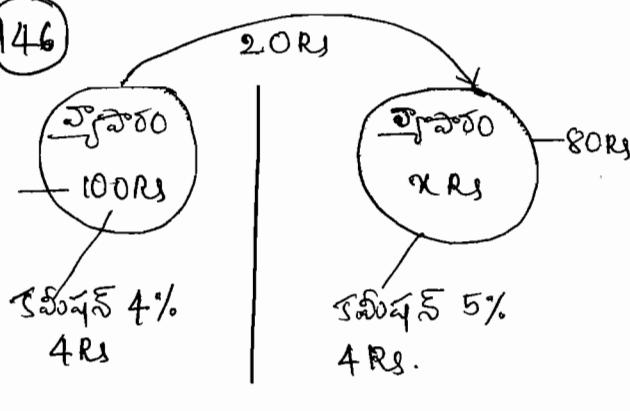
$$a+b+\frac{ab}{100} = 20$$

$$-25+x+\frac{-25 \times x}{100} = 20$$

$$\frac{3x}{4} = \frac{15}{45}$$

$$x = 60\% \uparrow$$

146



$$\begin{aligned} 5\% x &= 4 \text{ Rs} \\ \frac{5}{100} x &= 4 \text{ Rs} \\ x &= 80 \text{ Rs} \end{aligned}$$

147

$$\text{असल धनराशी} = \frac{x}{4}$$

$$\begin{aligned} \text{उत्तम धनराशी} &= \frac{\frac{7}{4} \times x}{\frac{18}{9} \times y} = \frac{7x}{9y} \\ &= \frac{7}{9} \left( \frac{x}{y} \right) \end{aligned}$$

$$\rightarrow \frac{7}{9} (\text{असल धनराशी})$$

148

$$\text{धर} \times \text{विनियोग} = \text{अमूल} (\text{शुद्ध})$$

$$30\% \uparrow \quad \downarrow$$

$$30\% \uparrow = \frac{3}{10} \uparrow \Rightarrow \frac{3}{10+3} \downarrow = \frac{3}{13} \downarrow = \frac{3}{13} \times 100$$

$$\frac{a}{b} \uparrow \Rightarrow \frac{a}{b+a} \downarrow \Rightarrow \frac{\frac{300}{13}}{1} \% \downarrow$$

विनियोग 23  $\frac{1}{13}\%$  घट्ट.

149

$$\text{धर} \times \text{विनियोग} = \text{अमूल} (\text{शुद्ध}).$$

$$16\% \downarrow \quad \uparrow$$

$$16\% \downarrow = \frac{16}{100} \downarrow = \frac{4}{25} \downarrow \Rightarrow \frac{4}{25-4} \uparrow = \frac{4}{21} \uparrow$$

$$= \frac{4}{21} \times 100$$

$$= \frac{400}{21} \Rightarrow 19 \frac{1}{21}\% \uparrow (\text{विनियोग})$$

$$\begin{aligned} \text{विनियोग} &= 100 + 19 \frac{1}{21} \\ &= 119 \frac{1}{21} \end{aligned}$$

Question on प्रतिशेष Just Safety

150

$$\text{धर} \times \text{विनियोग} = \text{अमूल} (\text{शुद्ध})$$

$$25\% \uparrow \quad \downarrow$$

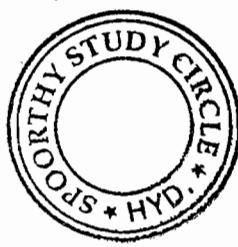
$$25\% \uparrow = \frac{1}{4} \uparrow \Rightarrow \frac{1}{4+1} \downarrow = \frac{1}{5} \downarrow = 20\% \downarrow$$

$$\frac{a}{b} \uparrow \Rightarrow \frac{a}{b+a} \downarrow$$

विनियोग में अपरिवर्तन : विनियोग

$$\begin{aligned} 20\% &: \frac{100}{5} \\ 1 &: 5 \end{aligned}$$

151



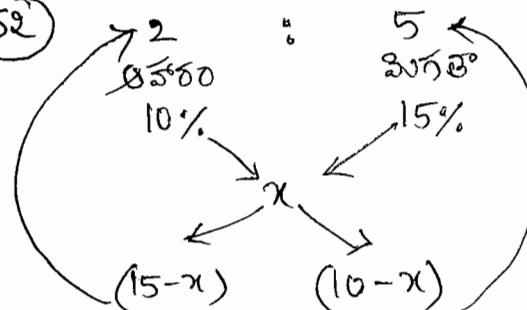
$$6 \text{ Rs} \longrightarrow 7.50 \text{ Rs}$$

$$= \frac{1.5}{6} \times 100 = 25\% \uparrow$$

$$25\% \uparrow = \frac{1}{4} \uparrow \Rightarrow \frac{1}{4+1} \downarrow = \frac{1}{5} \downarrow = 20\% \downarrow$$

$$\frac{a}{b} \uparrow \Rightarrow \frac{a}{b+a} \downarrow$$

152



कलन विधि  
समाप्ति  
दृष्टिकोण.

$$\frac{15-x}{x-10} \times \frac{2}{5}$$

$$75 - 5x = 2x - 20$$

$$7x = 95$$

$$x = \frac{95\%}{7}$$

$$= \frac{95\%}{7} \times 2590$$

$$\begin{aligned} &= \frac{95}{7} \times \frac{1}{100} \times 2590 \\ &= 351.5 \end{aligned}$$

37

153

$$\begin{array}{ccccccc}
 64000 & \xrightarrow{2.5\%} & 65600 & \xrightarrow{2.5\%} & 67240 & \xrightarrow{2.5\%} & \\
 +1600 & & +1640 & & +1681 & & \\
 \hline
 67240 & & 1681 & & & & \\
 \hline
 & & \hline
 & & 68921 & & & & \\
 \hline
 \end{array}$$

(OR)

$$\begin{aligned}
 & 64000 \times \frac{102.5}{100} \times \frac{102.5}{100} \times \frac{102.5}{100} \\
 & = 64000 \times \frac{1025}{1000} \times \frac{1025}{1000} \times \frac{1025}{1000} \\
 & = 68921 (41 \times 41 \times 41)
 \end{aligned}$$

154

$$20 \text{ Rs} \xrightarrow[+1.6 \text{ Rs}]{8\% \uparrow} 21.6 \text{ Rs} \xrightarrow[+1.6 \text{ Rs}]{8\% \uparrow} 21.6$$

$$\begin{array}{c|c}
 1\% = 0.2 & 1\% = 0.216 \\
 8\% = 1.6 & 8\% = 1.728 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 21.6 \\
 1.728 \\
 \hline
 23.328
 \end{array}$$



155

$$\begin{array}{r}
 1,60,000 \\
 \xrightarrow{3\%} 4800 \\
 \xrightarrow{2.5\%} 164800 \\
 \quad \quad \quad 4120 \\
 \hline
 \xrightarrow{5\%} 168920 \\
 \quad \quad \quad 8446 \\
 \hline
 \quad \quad \quad 177366
 \end{array}$$

156

$$62500 \xrightarrow[-2500]{4\% \downarrow} 6000 \xrightarrow[-2400]{4\% \downarrow} 57600$$

$$62500 \times \frac{96}{100} \times \frac{96}{100} \times \frac{96}{100} = 5760$$

157

$$\begin{array}{ccccccc}
 100 \text{ Rs} & \xrightarrow{-20}{20\% \downarrow} & 80 \text{ Rs} & \xrightarrow{-16 \text{ Rs}}{20\% \downarrow} & 64 \text{ Rs} & \xrightarrow{-12.8}{20\% \downarrow} & 51.2 \\
 & & & & & & \\
 \end{array}$$

$$\text{మొత్తస్కిల్చర్ రూ.} = 100 - 51.2 = 48.8$$

(ii)

$$100 \text{ Rs} \times \frac{80}{100} \times \frac{80}{100} \times \frac{80}{100} = 51.2$$

$$\text{మొత్తస్కిల్చర్ రూ.} = 100 - 51.2 = 48.8$$

$$\begin{array}{ccc}
 (iii) & 20\% \downarrow & 20\% \uparrow & 20\% \downarrow \\
 & = a+b+\frac{ab}{100} & & \\
 & = -20-20+\frac{-20 \times -20}{100} & & \\
 & = -40+4 & & \\
 & = -36 & & \\
 \hline
 \end{array}$$

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

$$= -36-20+\frac{-36 \times -20}{100}$$

$$= -56+7.2$$

$$= -48.8$$

158

$$x \times \frac{105}{100} \times \frac{105}{100} \times \frac{105}{100} = 138915$$

$$x = 15 \times 8000$$

$$x = 120,000$$

159

$$x \times \frac{90}{100} \times \frac{90}{100} \times \frac{90}{100} = 8748$$

$$x = 12000$$

160

$$\begin{array}{r}
 \text{Jan} \quad \text{Feb} \quad \text{Mar} \quad \text{April} \\
 = 4000 \times \frac{105}{100} \times \frac{95}{100} \times \frac{90}{100} \\
 = 21 \times 19 \times 9 \\
 = 3591
 \end{array}$$

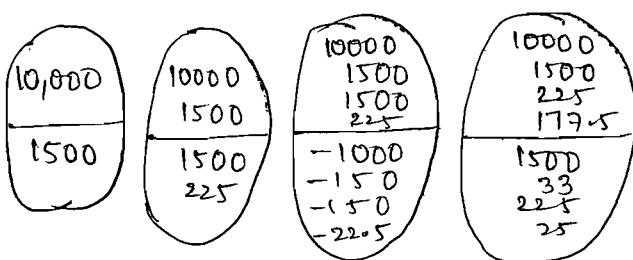
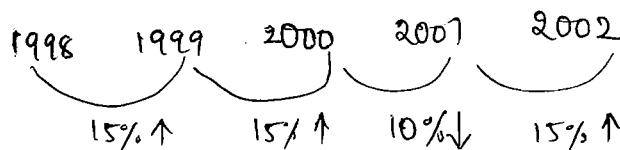
(161)

$$x \times \frac{110}{100} \times \frac{108}{100} \times \frac{90}{100} = \frac{10}{30} = 26.730$$

$\cancel{x_1}$   
 $\cancel{x_2}$   
 $\cancel{100}$   
 $\cancel{100}$   
 $\cancel{100}$

$$x = 25000$$

(162)



$$\text{మొత్తంగు} = 36.85\%$$

(OR)

$$\textcircled{1} 15+15+\frac{15 \times 15}{100} = 32.25$$

$$\textcircled{2} 32.25-10+\frac{32.25 \times -10}{100}$$

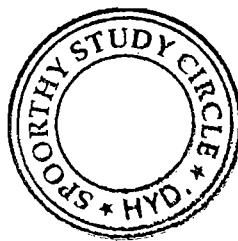
$$= 22.25-3.225$$

$$= 19$$

$$\textcircled{3} = 19+15+\frac{19 \times 15}{100}$$

$$= 34+2.85$$

$$= 36.85\%$$



(163) సర్కరుపెట్టిమార్గు =

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

$$1331 = 10 \left(1 + \frac{r}{100}\right)^3$$

$$\frac{1331}{1000} = \left(1 + \frac{r}{100}\right)^3$$

$$\left(\frac{11}{10}\right)^3 = \left(1 + \frac{r}{100}\right)^3$$

$$\frac{11}{10} = 1 + \frac{r}{100}$$

$$1 + \frac{1}{10} = 1 + \frac{r}{100} \Rightarrow$$

$$\frac{1}{10} = \frac{r}{100}$$

$$r = 10\%$$

(164) 'n' లంపట్టుల తరువాత

$$\text{భవనముచుట} = \text{శ్యామలియిచుట}$$

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

$$133100 \left(1 - \frac{10}{100}\right)^n = 72900 \left(1 + \frac{10}{100}\right)^n$$

$$1331 \times \left(\frac{9}{10}\right)^n = 729 \left(\frac{11}{10}\right)^n$$

$$\frac{1331}{729} = \left(\frac{11}{10} \times \frac{10}{9}\right)^n$$

$$\frac{11^3}{9^3} = \left(\frac{11}{9}\right)^n$$

$$\left(\frac{11}{9}\right)^3 = \left(\frac{11}{9}\right)^n$$

$$n = 3$$

$$\textcircled{165} \quad 4\% \uparrow \quad \frac{1}{2}\% \downarrow = 3.5\% \uparrow$$

$$3.5\% \uparrow \quad 3.5\% \uparrow$$

$$\downarrow$$

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

$$= 3.5+3.5+\frac{3.5 \times 3.5}{100}$$

$$= 7+0.1225$$

$$= 7.1225$$

$$3.5\% \uparrow$$

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

$$= 7.1+3.5+\frac{7.1 \times 3.5}{100}$$

$$= 10.6 + \text{Something}$$

$$= 10.8$$

(166)

birth rate	32	1000
------------	----	------

Death Rate	11	1000
------------	----	------

$$\frac{32-11}{1000} = 21$$

21 గ్రహి 1000 లో ఎంతసాతు

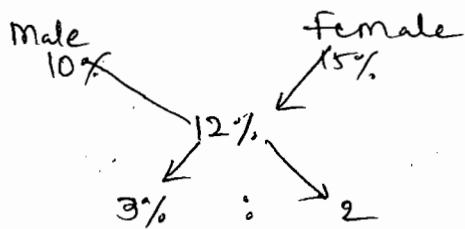
$$= \frac{21}{1000} \times 100$$

$$= 2.1\%$$

167

500 వచ్చింది.

$$\begin{array}{ccc} 5000 & & 5600 \\ \downarrow & & \downarrow \\ \frac{600}{5000} \times 100 & = & 12\% \uparrow \end{array}$$



$$\text{Male} = \frac{2}{5} \times \frac{10000}{5000} = 2000$$

$$\text{Female} = \frac{3}{5} \times \frac{10000}{5000} = 3000$$

168

$$25\% \uparrow = \frac{1}{4} \uparrow \Rightarrow \frac{1}{4+1} \downarrow = \frac{1}{5} \downarrow = 20\% \downarrow$$

$$\text{గెనిస్ తల్లాళ రాబుకి} = 100 - 20 \\ = 80\%,$$

169

$$50\% \uparrow = \frac{1}{2} \uparrow \Rightarrow \frac{1}{2+1} \downarrow = \frac{1}{3} \downarrow = 33.33\% \downarrow$$

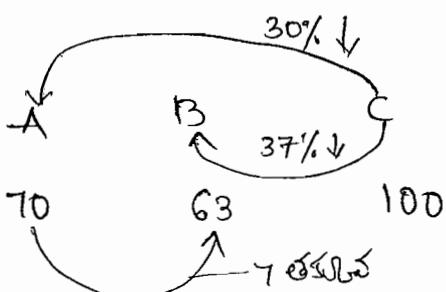
170

$$40\% \downarrow \Rightarrow \frac{2}{5} \downarrow \Rightarrow \frac{2}{5-2} \uparrow = \frac{2}{3} \uparrow = 66.66\% \uparrow.$$

171

$$\begin{array}{l|l} P = 62 & 5 \text{ అస్తిటెల్ ఎంతకాలం? \\ \frac{P}{2} = \frac{6}{1} & = \frac{5}{6} \times 100 \\ P:2 = 6:1 & = 83.33\% \downarrow \\ 5 \text{ తయారు} & \end{array}$$

172



$$= \frac{7}{70} \times 100 = 10\%$$

173

$$\begin{array}{ccc} 12.5\% & & 25\% \\ \downarrow & & \downarrow \\ A & B & C \\ 112.5 & 125 & 100 \end{array}$$

$$= \frac{\text{మాటింగ్ సోఫ్ట్}}{\text{పాయిస్ సోఫ్ట్}} \times 100$$

పాయిస్ సోఫ్ట్ లో

$$= \frac{112.5}{125} \times 100$$

$$= 90\%$$

174

$$A = 40\% B \quad B = 25\% C$$

$$A = \frac{2}{5} B \quad B = \frac{1}{4} C$$

$$\frac{A}{B} = \frac{2}{5} \quad \frac{B}{C} = \frac{1}{4}$$

$$\frac{A}{B} \times \frac{B}{C} = \frac{2}{5} \times \frac{1}{4}$$

$$A:C = 1:10$$

$$\frac{A \text{ లక్షం}}{C \text{ లక్షంలో}} = \frac{1}{10} \times 100 \Rightarrow 10\%$$

175

$$5\% A = 15\% B \quad 10\% B = 20\% C$$

$$\frac{A}{B} = \frac{3}{1} \quad \frac{B}{C} = \frac{2}{1}$$

$$A:B = 3:1 \quad B:C = 2:1$$

$$\begin{array}{c} A:B = 3:1 \\ B:C = 2:1 \end{array} \xrightarrow{\text{Cross multiply}}$$

$$A:B:C = 6:2:1$$

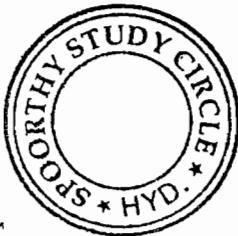
$$1 \longrightarrow 2000$$

$$ABC \rightarrow 18,000/-$$

$$\begin{aligned} \textcircled{191} \quad \text{మొత్తం రుష్య} &= 600 \times \frac{25}{100} + 1200 \times \frac{50}{100} \text{ Rs} \\ &= 150 + 600 \\ &= 750 \text{ Rs.} \end{aligned}$$

$$\begin{aligned} \text{తీవ్రినది} &= 12\% \cdot 150 + 24\% \cdot 600 \\ &= 18 + 144 \\ &= 162 \text{ Rs} \end{aligned}$$

$$\begin{aligned} \text{రుష్య} &= \frac{54}{750} \times 100 \\ &\quad \begin{array}{l} \cancel{54} \\ \cancel{750} \\ \cancel{15} \end{array} \\ &= \frac{108}{5} = 21.6\% \end{aligned}$$



$$\begin{aligned} \textcircled{192} \quad \text{ఫర్} \times \text{విఱియోగం} &= \text{అధ్యు} - \text{స్థాపి} \\ \text{ఫర్} \times \frac{1}{50} &= \frac{21}{100} = \frac{1}{50} \downarrow \rightarrow \frac{1}{50-1} \uparrow = \frac{1}{49} \uparrow \\ \boxed{\frac{a}{b} \downarrow \Rightarrow \frac{a}{b-a} \uparrow} \end{aligned}$$

$$\text{విఱియోగం} = 49 \text{ kgs}$$

$$\frac{1}{49} \times 49 \text{ kg} = 1 \text{ kg} \uparrow$$

$$\text{క్రితి విఱియోగం} = 49 + 1 = 50 \text{ kg.}$$

**OR**

$$\text{ఫర్} \times \text{విఱియోగం} = \text{అధ్యు}$$

$$\text{మందుఫర్} 100 \text{ Rs} - \text{ప్రస్తావము.}$$

$$100 \text{ Rs} \times 49 \text{ kgs} = \text{అధ్యు}$$

$$2 \times \downarrow \quad 98 \text{ Rs} \times x \text{ kgs} = \text{అధ్యు}$$

$$\cancel{100} \times \cancel{49} = \cancel{98} \times x$$

$$x = 50 \text{ kgs.}$$

$$\textcircled{193} \quad \frac{\text{మొత్తం రుష్య}}{\text{మందుఫర్}} = \text{విఱియోగం.}$$

$$\text{రంధ్రం సారా కొండిక - వెదుటం సారా కొండిక} = 10.5 \text{ kgs}$$

$$\frac{\text{మొత్తం రుష్య}}{\text{రంధ్రం సారా కొండిక}} \rightarrow \frac{\text{మొత్తం}}{\text{రంధ్రం సారా కొండిక}} = 10.5$$

$$\frac{100 \text{ Rs}}{79x} - \frac{100 \text{ Rs}}{100x} = \frac{21}{2}$$

$$\frac{100}{x} \left( \frac{100 - 79}{79 \times 100} \right) = \frac{21}{2}$$

$$\frac{100}{x} \left( \frac{21}{79 \times 100} \right) = \frac{21}{2}$$

$$x = \frac{2}{79} \text{ Rs.}$$

$$\begin{aligned} \text{రంధ్రం సారా కొండిక} &= 79x \\ &= 79 \times \frac{2}{79} \\ &= 2 \text{ Rs.} \end{aligned}$$

**OR**

$$\frac{\text{ఫర్}}{21\% \downarrow} = \frac{21}{100} \downarrow \rightarrow \frac{21}{100-21} \uparrow = \frac{21}{79} \uparrow$$

$$\boxed{\frac{a}{b} \downarrow \Rightarrow \frac{a}{b-a} \uparrow}$$

మందుఫర్ = n కొండిక

$$\text{పరిశీలన విఱియోగం} = \frac{21}{79} \times n = \frac{21}{2}$$

$$n = \frac{79}{2} \text{ కొండిక}$$

$$\text{మందుఫర్} = \frac{\text{మొత్తం రుష్య}}{\text{విఱియోగం}} = \frac{100 \text{ Rs}}{\frac{79}{2}} = \frac{200}{79} \text{ Rs}$$

$$\text{ప్రస్తావము} = 79\% \cdot \frac{200}{79}$$

$$= \frac{79}{100} \times \frac{\frac{200}{2}}{79}$$

$$= 2 \text{ Rs.}$$

194) ప్రారంభిక గుడ్కుస్థ - శైఖచంద్రస్థ = 3

$$\frac{\text{మొత్తం తెఱ్ణ}}{\text{మొత్తం గుడ్కుస్థ}} = \frac{\text{మొత్తం}}{\text{శైఖచంద్రస్థ}} = 3$$

$$\frac{7.8}{100} - \frac{7.8}{1000} = 3$$

$$\frac{7.8}{x} \left( \frac{130 - 100}{130 \times 100} \right) = 3$$

$$\frac{7.8}{x} \left( \frac{30}{130 \times 100} \right) = 3$$

$$x = \frac{7.8}{1300} \Rightarrow x = \frac{786}{13000} \Rightarrow x = \frac{6}{1000}$$

$$\text{ప్రారంభిక గుడ్కుస్థ} = 130x \\ = 130 \times \frac{6}{1000}$$

$$\text{న్యూట్రిషన్ గుడ్కుస్థ} = \frac{13 \times 6}{100}$$

$$\text{టోల్స్ గుడ్కుస్థ} = \frac{13 \times 6}{100} \times 12 \\ = 9.36$$

OR

$$\frac{3}{10} \uparrow = \frac{3}{10+3} \downarrow = \frac{3}{13} \downarrow$$

$$\frac{a}{b} \uparrow \Rightarrow \frac{a}{b+a} \downarrow$$

వ్యంయ = n eggs.

$$\frac{3}{13} \times n = 3$$

$$= n = 13 \text{ రూప్యాలు}$$

$$\text{మొత్తం గుడ్కుస్థ} = \frac{\text{మొత్తం రూప్య}}{\text{బెల్లు రూప్య}} = \frac{7.8 \text{ Rs}}{13} = 0.6 \text{ Rs}$$

$$\text{న్యూట్రిషన్ గుడ్కుస్థ} = 130\% \cdot 0.6$$

$$\text{టోల్స్ గుడ్కుస్థ} = 12 \times 130\% \cdot 0.6 \\ = 12 \times 1.3 \times 0.6 \\ = 9.36$$

195) రెండో స్థాయిటీల్స్ - మొత్తం = 6.21g

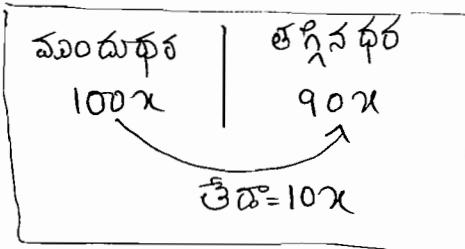
$$\frac{279}{90x} - \frac{279}{100x} = \frac{62}{10}$$

$$\frac{279}{x} \left( \frac{100-90}{90 \times 100} \right) = \frac{62}{10}$$

$$\frac{10}{x \times 10 \times 10} = 2$$

$$x = \frac{1}{20} = 0.05$$

$$\text{తేడా} = 10x = 10 \times 0.05 = 0.5.$$



$$10\% \downarrow = \frac{1}{10} \downarrow \Rightarrow \frac{1}{10-1} \uparrow = \frac{1}{9} \uparrow$$

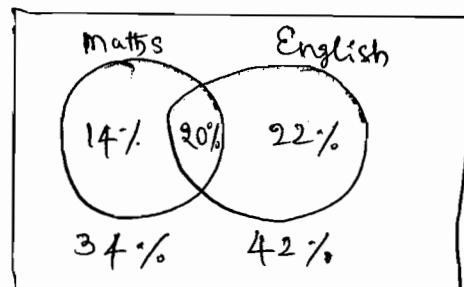
$$n \text{ లేఖలు} \quad \frac{1}{9} \times n = 6.2$$

$$n = 6.2 \times 9 \text{ లేఖలు}$$

$$\text{మొత్తం గుడ్కుస్థ} = \frac{\text{రూప్య}}{\text{లేఖలు}} = \frac{279}{62 \times 9} = \frac{10}{2} = 5$$

$$\text{తేడా} = 10\% \text{ తెగ్గినాలు} = 10\% \cdot 5 = 0.5$$

196)



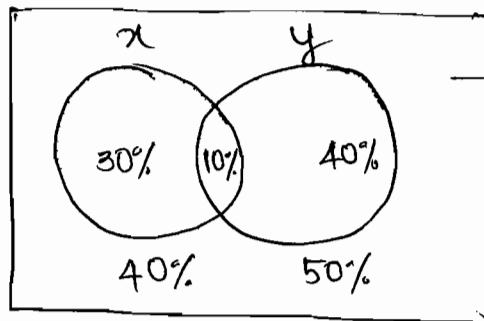
→ Failed Candidates

$$\text{మొత్తం failed} = 14 + 20 + 22\% \Rightarrow 56\%$$

$$\text{pass \%} = 100 - 56\% = 44\%.$$

ప్రత్తి = 100% మంది అనుకో.

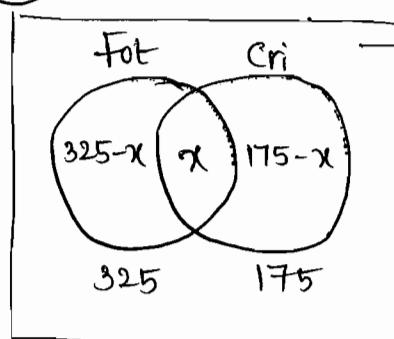
197



$$\begin{aligned} \text{ప్రత్తిలున వారు నిటి} \\ \text{-చదువువారు} \\ = 100\% - 80\% \\ = 20\% \end{aligned}$$

ప్రత్తింపిణ్ణింపులు చదివే వారు =  $30+10+40=80\%$

198

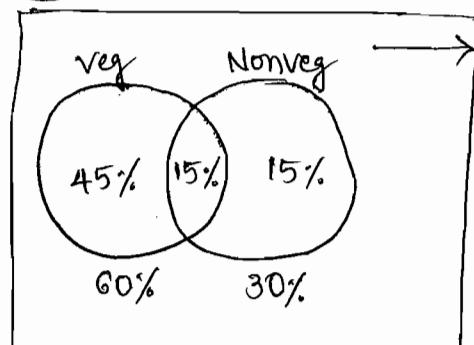


$$\begin{aligned} \text{ప్రత్తి} &= 450 \\ &\quad - 50 \\ &\quad \hline 400 \\ 50 \text{ మంది నిటి యిషటు} \\ 400 \text{ కిణ్ణింపు చదివే వారు} \end{aligned}$$

$$\begin{aligned} 325-x + x + 175-x &= 400 \\ 500-400 &= x \\ x &= 100 \text{ మంది.} \end{aligned}$$



199



ప్రత్తి తీసే వారు =  $45+15+15=75\%$ .

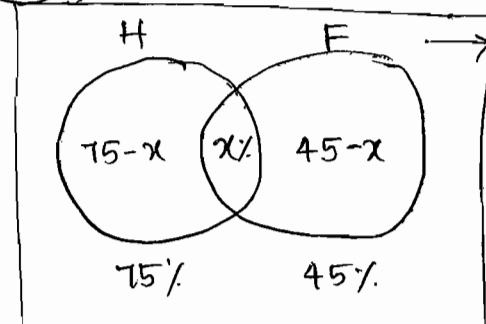
ప్రత్తి తీసే వారు =  $100\% - 75\% = 25\%$ .

$$= 25\% \times 96$$

$$= 24 \text{ మంది.}$$

200

ప్రత్తి మంది 100% అనుసుమ.

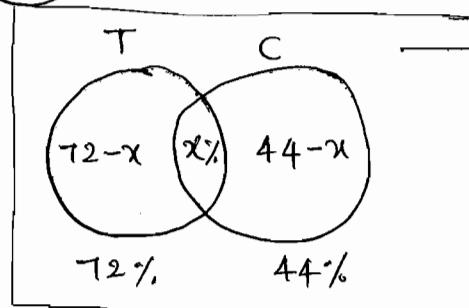


$$\begin{aligned} 75-x+x+45-x &= 100 \\ 120-100 &= x \\ 20 \text{ మంది వారు} &= x = 20\% \end{aligned}$$

$$x = 20\% \times 600$$

$$x = 120$$

201

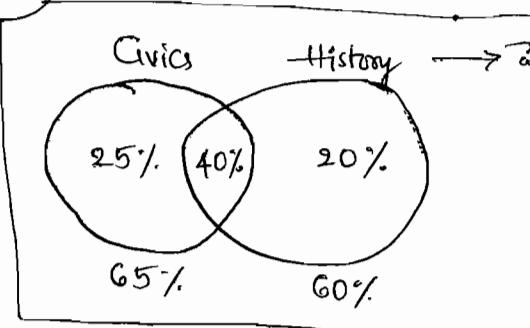


$$\begin{aligned} \text{ప్రత్తి} &= 72-x+x+44-x = 100 \\ 116-100 &= x \end{aligned}$$

$$20 \text{ మంది} x = 16\%$$

$$\begin{aligned} 16 &\rightarrow 40 \text{ మంది} \\ 100 &\rightarrow ? = \frac{\frac{50}{100} \times \frac{5}{40}}{\frac{16}{2}} = 250 \end{aligned}$$

202



Passed Candidates

ప్రత్తి సబ్జెక్టులు చదువువారు =  $25+40+20=85\%$ .

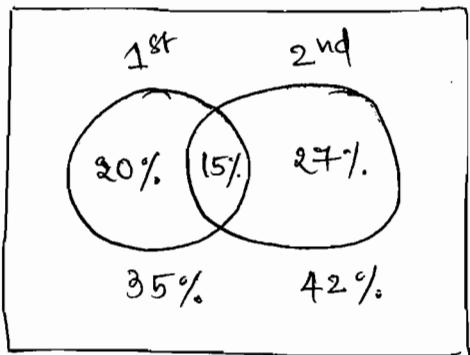
Failed =  $100\% - 85 = 15\%$ .

$$15 \rightarrow 90$$

$$100\% \rightarrow ? = \frac{100 \times 90}{15} = 600$$

203

మొత్త 100% అస్వానువా.



Failed Candidates.

$$\begin{aligned}
 \text{క్రిస్ సబ్జెక్ట్ లో మొత్తమే} &= 20 + 27\% \\
 &= 47\% \\
 &= 47 \times 2500 \\
 &= 1175
 \end{aligned}$$



# PROFIT & LOSS

CP → Cost price (క్షेत्रపల)

SP → Selling price (అందువలెను)

MP → Marked price / Listed price /  
Labeled price → (మరిగొప్పిన విషయాలలో)

\* ఏథరు లో కొన్ని విషయాలలో స్టార్ట్ లేదా ఎంబ్రేజ్ లేవు వ్యతిశాఖలలో ఉన్నాయి.

Examples:

Q) CP = 300Rs, SP = 400, Profit% = ?

మొత్తము కొన్ని విషయాలలో కొన్ని విషయాలలో ఉన్నాయి.

$$(i) \text{ Profit\%} = \frac{\text{MP} - \text{CP}}{\text{CP}} \times 100 \\ = \frac{400 - 300}{300} \times 100 = \frac{100}{300} \times 100 = \frac{1}{3} = 33.33\% \uparrow$$

$$(ii) \text{ Profit\%} = \frac{\text{SP} - \text{CP}}{\text{CP}} \times 100 \\ = \frac{400 - 300}{300} \times 100 = 33.33\% \uparrow$$

$$(iii) \frac{\text{MP}}{\text{CP}} = \frac{\text{SP}}{\text{CP}} = \frac{400}{300} = \frac{4}{3} \quad \text{ప్రాథమిక}$$

$$\text{Profit\%} = \frac{1}{3} \times 100 = 33.33\% \uparrow$$

$$(iv) \frac{\text{SP}}{\text{CP}} = \frac{400}{300} = \frac{4}{3} = 1 + \frac{1}{3} \quad \text{ప్రాథమిక} \\ = \frac{1}{3} \times 100 = 33.33\% \uparrow$$

$$(v) \frac{\text{SP}}{\text{CP}} = \frac{400}{300} = \frac{4}{3} = 1 + 0.3333 \quad \text{ప్రాథమిక}$$

$$= 0.3333 \times 100$$

$$= 33.33\% \uparrow$$

Q) CP = 300Rs, SP = 200, నెప్పుకొతు = ?

$$(i) \text{Neppu} = \frac{\text{SP} - \text{CP}}{\text{CP}} \times 100 = \frac{200 - 300}{300} \times 100 \\ = \frac{-100}{300} \times 100 = -33.33\% \downarrow$$

(ii) 100 మణిది 300 లోగి వింతకొతు?

$$= \frac{100}{300} \times 100 = 33.33\% \downarrow$$

$$(iii) \frac{\text{MP}}{\text{CP}} = \frac{\text{SP}}{\text{CP}} = \frac{200}{300} = \frac{2}{3} \quad \text{1 త్రిభాగి} \\ \Rightarrow \frac{1}{3} \times 100 = 33.33\% \downarrow$$

$$(iv) \frac{\text{SP}}{\text{CP}} = \frac{200}{300} = \frac{2}{3} = 1 - \frac{1}{3} \quad \text{నెప్పు} \\ = 33.33\% \downarrow$$

Q) CP = 400Rs, లాఫ్టుకొతు = 20%, SP = ?

(i) 100% (P → 400 Rs)

$$120\% \rightarrow ? = \frac{120 \times 400}{100} = 480$$

(ii) SP = 120% CP

$$SP = \frac{6}{5} \times 400$$

$$SP = 480$$

(iii) SP = 120% CP

$$SP = 1.2 \times CP \\ = 1.2 \times 400$$

$$SP = 480$$

(iv) = 20% 400

$$= 80$$

$$= 400 + 80 = 480$$

Q) CP = 500, నెప్పుకొతు = 10%, SP = ?

(i) 100% → 500

$$90\% \rightarrow ? = \frac{90 \times 500}{100} = 450$$

(ii) SP = 90% CP

$$= \frac{9}{10} \times 500 \Rightarrow 450$$

(iii) 10% 500

$$= 50$$

$$= 500 - 50 \Rightarrow 450.$$

Q1)  $Sp = 960$ , లాఘవతో  $= 20\%$ ,  $Cp = ?$

(i)  $120\% \rightarrow 960$

$$\frac{Cp}{100\%} \rightarrow ? \quad \frac{100 \times 960}{120\%} = 800$$

(ii)  $Sp = 120\% Cp$

$$\frac{160}{960} = \frac{16}{5} \times Cp \Rightarrow Cp = 800$$

(iii)  $Sp = 120\% Cp$

$$\frac{80}{960} = \frac{1}{12} \times Cp$$

$$Cp = 800$$

Q2)

$Sp = 810$ , నష్టతో  $= 10\%$ ,  $Cp = ?$

i)  $Sp = 90\% \rightarrow 810$

$$Cp = 100\% \rightarrow ? \quad \frac{100 \times 810}{90\%} = 900$$

ii)  $Sp = 90\% Cp$

$$\frac{90}{810} = \frac{9}{10} \times Cp \Rightarrow Cp = 900$$

iii)  $Sp = 90\% Cp$

$$\frac{810}{90\%} = 0.9 \times Cp \Rightarrow Cp = 900$$



Q3) 5 రూపాలను 6 రూ. 11 లంబులై, 6 రూపాలను 5 రూ. 10 లంబులై లాభ/నష్టతో వివరాలను సమానం చేయాలి.

1st Step కొన్నటలను సమానం చేయాలి.

2nd Step  $Cp = 36$ ,  $Sp = 25$

$$= \frac{11}{36} \times 100\% \Rightarrow \frac{275}{9} \Rightarrow 30 \frac{5}{9}\% \downarrow$$

Q4) 12 లంబుల ఇస్కు 15 లంబుల అధ్యానాల ను 6 రూ. లాభ/నష్టతో వివరాలను సమానం చేయాలి.

$$\frac{12}{15} Cp = \frac{5}{4} Sp$$

$$\frac{Sp}{Cp} = \frac{4}{5} \left( \text{లాభం} \right) \Rightarrow \frac{1}{5} \times 100\% = 20\% \downarrow$$

Q5) 20 రూపాల చిట్టుగూ అప్పునపుడు 5 రూపాల లాఘవతో నమోదు చేయాలి. లాఘవతో వివరాలను సమానం చేయాలి.

లాఘవ = గ.వ - భ.వ

$$5Sp = 20Sp - 20Cp$$

$$20Sp = 20Sp - 5Sp$$

$$20Cp = \frac{15}{3} Sp$$

$$\frac{Sp}{Cp} = \frac{4}{3} \left( 1 \text{ రూపాలు} \right)$$

$$\frac{1}{3} \times 100 = 33.33\% \uparrow$$

Q6) 16 రూపాల చిట్టుగూ అప్పునపుడు 4 రూపాల లాఘవతో నమోదు చేయాలి. లాఘవతో వివరాలను సమానం చేయాలి.

నష్టం = భ.వ - గ.వ

$$4Cp = 16Cp - 16Sp$$

$$16Sp = 16Sp - 4Cp$$

$$4Sp = \frac{1}{3} Cp$$

$$\frac{Sp}{Cp} = \frac{3}{4} \left( 1 \text{ రూపాలు} \right)$$

$$\frac{Sp}{Cp} = \frac{1}{4} \times 100$$

$$= 25\% \downarrow \text{నష్టం}$$

R.S. Aggarwal Book

1) లాఘవతో  $= \frac{70 \text{ Paise}}{70 \times 100} = 1\%$

2) a)  $\frac{17}{36} \times 100\% = \frac{425}{9} = 47 \frac{2}{9}\%$

b)  $\frac{24}{50} \times 100\% = 48\%$

c)  $\frac{19}{40} \times 100\% = \frac{95}{4} = 47.5\%$

d)  $\frac{29}{60} \times 100\% = \frac{145}{3} = 48 \frac{1}{3}\%$

3) Cp Sp  
200 - 350 300 - 1425  
గట్టం లాఘవ = 225

$$8 \text{ books లాఘవ} = 8 \times 225 = 1800$$

$$\textcircled{4} \quad \begin{array}{r} \text{Sp} \quad 2602.58 \\ \rightarrow \text{CP} \quad 2090.42 \\ \hline \text{Profit} \quad \times 512.16 \end{array}$$

$$\text{Profit \%} = \frac{\text{P}}{\text{CP}} \times 100 = \frac{512.16}{2090} \times 100 = 25\%$$

Approximately 25% profit.

$$\textcircled{5} \quad \text{CP} = 4700 + 800 = 5500$$

$$\text{Sp} = 5800 \leftarrow \text{Profit} = 300 \text{Rs}$$

$$\text{Profit \%} = \frac{300}{5500} \times 100 = \frac{6}{11} = 5\frac{5}{11}\%$$



$$\textcircled{6} \quad \begin{array}{l} 10 \text{ kgs} \rightarrow 420 \text{ Rs} \\ 1 \text{ kg} \rightarrow ? = \frac{420 \times 1}{10} = 6 \text{ Rs/kg} \end{array}$$

$$\begin{array}{ccc} \text{CP} & & \text{SP} \\ 6 \text{ Rs} & & 6.5 \text{ Rs} \\ & 0.51 & \uparrow \\ & \text{Profit} = 0.5 \text{ Rs} = \frac{1}{2} \text{ Rs.} & \end{array}$$

$$\text{Profit \%} = \frac{\frac{1}{2}}{6} \times 100 = \frac{1}{12} \times 100 = 8.33\% \text{ (OR) } 8\frac{1}{3}\%$$

$$\textcircled{7} \quad \text{CP} = 375 \text{ Rs/dozen}$$

$$\text{SP} = 33 \times 12 \text{ Rs/dozen}$$

$$\frac{\text{SP}}{\text{CP}} = \frac{33 \times 12}{375} = \frac{132}{125} \leftarrow \text{Profit \%}$$

$$\text{Profit \%} = \frac{7}{125} \times 100 = \frac{28}{5} = 5.6\%$$

$$\textcircled{8} \quad \begin{array}{r} \text{CP} \\ 100 \rightarrow 350 \text{Rs} \\ 1 \rightarrow ? \\ = \frac{350}{100} \\ = 3.5 \text{ Rs} \end{array} \quad \begin{array}{r} \text{Sp} \\ 12 \rightarrow 48 \text{Rs} \\ 1 \rightarrow ? \\ = \frac{48}{12} \\ = 4 \text{ Rs} \end{array}$$

0.5  $\cancel{\text{Rs}}$

$$= \frac{0.51}{3.5} \times 100 = \frac{1}{7} \times 100 \Rightarrow 14\frac{2}{7}\% \uparrow$$

OR

$$\begin{array}{r} \text{CP} \\ 100 \quad 350) \times 6 \quad (12 \quad 48) \times 50 \end{array}$$

వస్తువునిసంఖ్యలు  $\underline{[100, 12]} = 600$

$$\begin{array}{r} \text{CP} \quad 2100 \quad \text{Sp} \quad 2400 \\ \cancel{200} \quad \cancel{600} \quad \cancel{300} \text{ emp } 0 \\ = \frac{200}{2100} \times 100 \Rightarrow \frac{1}{7} \times 100 \Rightarrow 14\frac{2}{7}\% \uparrow \end{array}$$

$$\textcircled{9} \quad \text{CP} = 1400$$

$$\begin{array}{l} 15\% \text{ sp } 0 \\ 100 \rightarrow 1400 \\ 85\% \rightarrow ? \\ = \frac{1400 \times 85}{100} \\ = 1190 \end{array} \quad \begin{array}{l} \text{Sp} = 85\% \text{ of } 1400 \\ \text{Sp} = \frac{85}{100} \times 1400 \\ \text{Sp} = 1190 \end{array}$$

$$\begin{array}{r} \text{CP} = 1400 \\ - 210 \\ \hline 1190 \end{array}$$

10

$$400 \xrightarrow[+80]{20\% \uparrow} 480 \xrightarrow[48]{10\% \uparrow} 528$$

OR

$$400 \times \frac{120}{100} \times \frac{110}{100} = 528$$

$$11) CP = 80,000 + 5000 + 1000$$

$$CP = 86,000$$

$$SP = 125\% CP$$

$$= \frac{5}{4} \times 86000$$

$$= 107500$$

$$120 \text{ Ream SP} = 10800$$

$$1 \text{ Ream SP} = \frac{10800}{120} = 90 \text{ Rs.}$$

17)

$$CP = 20 \text{ kg} \times 8 \text{ RS} + 10 \text{ RS} = 170 \text{ RS}$$

లొగ్గు = 170 RS

$$SP = 5 \text{ kg} \times 30 \text{ RS} + 20 \text{ kg} \times 4 \text{ RS} = 230 \text{ RS}$$

$$\text{లొగ్గు} = 230 - 170 = 60 \text{ RS.}$$

$$\text{సాధ్యత} = \frac{60}{170} \times 100$$

$$= \frac{600}{17} = 35.29\% \text{ లొగ్గు}$$

18)

$$\text{లొగ్గు} = 20\%$$

$$\text{లొగ్గు} = 20\% \text{ CP}$$

$$1100 = \frac{1}{5} \times CP$$

$$CP = 5500 \text{ (మరవ్వుతులకీ నేడు).}$$

$$\text{స్వాచ్ఛ అసలికర} + \text{మరవ్వుతుల} \\ 100\% + 10\% = 110\%$$

$$\text{మరవ్వుతులకర} 110\% \rightarrow 5500$$

$$\text{అసలికర} 100\% \rightarrow ? = 5000$$

$$\text{మరవ్వుతుల వీద భార్య} = 10\% \text{ అసలికర} \\ = 10\% \cdot 5000 \\ = 500$$

19)

కెప్ట

Reality | 228000

2000

2000

$$\begin{array}{c} 5\% \text{ waste} \\ 100 \\ \hline 1900 \text{ వ్యవహరించాలి} \\ \times 25 \text{ RS} \\ \hline 47,500 \end{array}$$

$$\begin{array}{c} 50\% \text{ waste} \\ 1000 \\ \hline 1000 \text{ వ్యవహరించాలి} \\ \times 25 \\ \hline 25,000 \end{array}$$

$$SP = 125\% CP$$

$$\frac{47500}{47500} = \frac{5}{4} \times CP$$

$$CP = 38,000$$

$$\text{స్టో} = 13,000$$

$$12) SP = 100 \text{ RS} \quad \text{Profit} = 15 \text{ RS}$$

$$CP = SP - \text{Profit} \Rightarrow 100 - 15 = 85 \text{ RS}$$

$$\text{సాధ్యత} = \frac{15}{85} \times 100$$

$$= \frac{300}{17} = 17 \frac{11}{17}$$

$$75\% \rightarrow 34.8$$

$$100\% \rightarrow ? = \frac{4}{100} \times 34.8 \\ = 46.4$$

10.30

$$100\% + 22.5\% = 122.5\%$$

$$10.3 122.5\% \rightarrow 392$$

$$\text{లొగ్గు} 22.5\% \rightarrow ?$$

$$5 \times 9 \\ \times 49 \\ = \frac{22.5 \times 392}{122.5} = 72 \text{ RS.}$$

15)

$$CP = x$$

$$x \times \frac{110}{100} \times \frac{112}{100} = 616$$

$$x = 500$$

$$16) 120 \text{ Reams } CP = 120 \times 80 \text{ RS} + 280 \text{ RS} + 120 \times \frac{40}{100} \\ + 72 \text{ RS}$$

$$= 9600 + 280 + 48 + 72$$

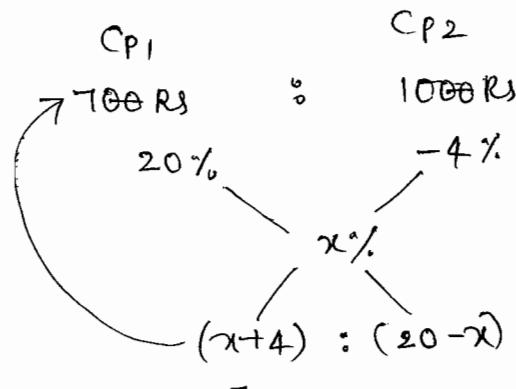
$$= 10,000$$

$$8\% \text{ profit } SP = 108\% 10,000 \\ = 10800$$

$$SP = 10800$$

[OR] ດັບໂຫຼາຍ ແລ້ວ ອະນຸຍາດ

ຮັບ = +, ສົ່ງ = -



$$\frac{x+4}{20-x} \times \frac{7}{10}$$

$$10x + 40 = 140 - 7x$$

$$17x = 100 \Rightarrow x = \frac{100}{17} = 5\frac{15}{17}$$

$$\text{ອຳນວຍ} = \frac{4}{3} \text{ ຕົວແລ}$$

$$Sp = \frac{4}{3} Cp$$

$$\frac{Sp}{Cp} = \frac{4}{3} \quad \text{ກົດປະກິດ.}$$

$$\text{ຮັບ} = \frac{1}{3} \times 100 = 33.33\%$$

$$Cp : Sp = 4 : 5$$

$$\frac{Cp}{Sp} = \frac{4}{5}$$

$$\frac{Sp}{Cp} = \frac{5}{4} \quad \text{ຂອດນັກທີ່ໄດ້ 1 ພະຍິກິດ.}$$

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

$$\frac{Sp}{Cp} = \frac{7}{5} \quad \text{ກົດປະກິດ}$$

$$\frac{Cp}{Sp} = \frac{2}{5} = 2 : 5$$

$$\text{Case 1} \quad \text{Case 2}$$

Cp 100 RS	Sp 120 RS	Cp 100 RS	Sp 240 RS
20% ຮັບ	140% ສົ່ງ	140% ຮັບ	140% ສົ່ງ

$$\text{ຮັບ} = \frac{140}{100} \times 100 = 140\%$$

(20) ເມື່ອ ລົງທຶນ = 600 RS  
ລົງທຶນ = 6%  
ກົດປະກິດ = 2%  $\left( \frac{12}{4} - 6\% \right)$   
ກົດປະກິດ = 2%  $(600 = 12\%)$   
 $Cp = \text{ກົດປະກິດ} + 12 = 612$   
 $Sp = 765 \quad \text{ຮັບ}$

$$\text{ຮັບ} = \frac{153}{612} \times 100 \Rightarrow 25\% \uparrow$$

(21) 85%  $\rightarrow 18700$   
115%  $\rightarrow ?$   
 $= \frac{115}{85} \times 18700$   
 $= 25300$

(22) 80%  $\rightarrow 9 RS$   
105%  $\rightarrow ?$   
 $= \frac{105}{80} \times 9 = \frac{189}{16} = 11.81 RS.$

(23) 6,30,000  $\rightarrow 105\%$   
5,00,000  $\rightarrow ?$   
 $= \frac{500,000 \times 105}{630,000} = \frac{250}{3} = 83.33\%$   
ສົ່ງ = 100% - 83.33% = 16.66%.

(24) ①  $Sp_1 = 120\% Cp$   
 $\frac{840}{5} = \frac{6}{1} \times Cp$   
 $Cp_1 = 700$   
 $Cp = 700 + 1000 = 1700 \quad \text{ຮັບ}$   
 $Sp = 840 + 960 = 1800 \quad \text{ຮັບ}$   
 $\text{ຮັບ} = \frac{100}{1700} \times 100 = 5\frac{5}{17}$

②  $Sp_2 = 96\% Cp_2$   
 $\frac{960}{100} = \frac{96}{1} \times Cp_2$   
 $Cp_2 = 1000$

	CP	SP	Loss
Case 1	$x \text{ Rs}$	$y \text{ Rs}$	$(y - x)$
Case 2	$x \text{ Rs}$	$2y \text{ Rs}$	$(2y - x)$

$$\begin{aligned} \text{Loss%} &= \text{CP} - \text{SP} \\ &= x - \frac{x}{16} \\ &= \frac{15x}{16} \end{aligned}$$

$$\text{Loss%} = \frac{15x}{16} = 15 \text{ Rs}$$

$$x = 16 \text{ Rs.}$$

కొత్త లాభ =  $3 \times \text{పొత్త లాభ}$

$$2y - x = 3(y - x)$$

$$2y - x = 3y - 3x$$

$$2x = y$$

$$\frac{SP}{CP} = \frac{y}{x} = \frac{2}{1} \quad \text{1 వర్గింధ.}$$

$$\text{లాభశతమానం} = \frac{1}{1} \times 100 \Rightarrow 100\%.$$

	CP	SP	Loss
Case 1	$x \text{ Rs}$	$y \text{ Rs}$	$y - x$
Case 2	$x \text{ Rs}$	$\frac{y}{2} \text{ Rs}$	$\frac{y}{2} - x$

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

$$3x = \left( x - \frac{y}{2} \right) \times 100$$

$$3x = 10x - 5y$$

$$7x = 5y$$

$$\frac{SP}{CP} = \frac{y}{x} = \frac{1}{5} \quad \text{2 వర్గింధ.}$$

$$\text{లాభశతమానం} = \frac{2}{5} \times 100 = 40\%.$$

31) SP ఏ 40% నుండి CP అధికంగా CP ఏ SP కండి?

$$CP = 40\% SP$$

$$CP = \frac{2}{5} \times SP$$

$$SP = \frac{5}{2} \times CP$$

$$SP = \frac{5}{2} \times \frac{100}{100 + 40} \times CP$$

$$SP = 250\% CP.$$

32) CP =  $x \text{ Rs}$  అన్నిసువు.

$$\text{Loss%} = \frac{x}{16} \text{ Rs}$$



$$\begin{aligned} \text{Loss%} &= \text{CP} - \text{SP} \\ &= x - \frac{x}{16} \\ &= \frac{15x}{16} \end{aligned}$$

$$\text{Loss%} = \frac{15x}{16} = 15 \text{ Rs}$$

$$x = 16 \text{ Rs.}$$

$$(33) \quad \frac{1}{4} \text{ లివంతు లాభ} = 25\% \text{ లాభ}$$

$$SP = 125\% CP$$

$$\frac{15}{375} = \frac{1}{4} \times CP$$

$$CP = 300$$

$$(34) \quad \text{అప్పినిషట �SP} = 100 \text{ Rs} \quad \text{అన్నిసువు.}$$

$$\text{Loss%} = 10\% SP$$

$$= 10\% 100 \text{ Rs}$$

$$= 10 \text{ Rs.}$$

$$\text{Loss%} = \text{CP} - \text{SP}$$

$$10 \text{ Rs} = CP - 100 \text{ Rs}$$

$$CP = 110 \text{ Rs}$$

$$\text{అనంత లాభశతమానం} = \frac{10}{110} \times 100 = 9\frac{1}{11}\%$$

$$(35) \quad \text{అప్పినిషట SP} = 300 \text{ Rs} \quad \text{అన్నిసువు.}$$

$$\text{Loss%} = \frac{1}{3} \times SP$$

$$= \frac{1}{3} \times 300$$

$$\text{Loss%} = 100 \text{ Rs}$$

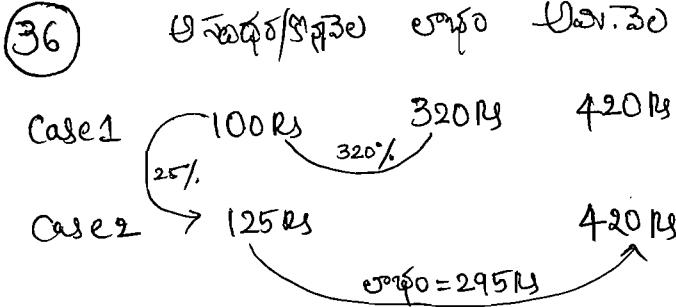
$$\text{Loss%} = \text{CP} - \text{SP}$$

$$100 = CP - 300$$

$$CP = 400$$

$$\text{అనంత లాభశతమానం} = \frac{100}{400} \times 100 \left( \frac{1}{4} \right)$$

$$= 25\% \downarrow \text{Loss%}.$$



ரூபாய் 295 முன்றி அவசியத்திற்கு 420 மீல்வாட்டுதல்

$$= \frac{295}{420} \times 100 \Rightarrow 70\% \text{ (எவ்வகு)} \\ \text{கிட.}$$

37) நம்மால்

$CP = 100 - 25$	$SP = 125 - 25$
$x = 832 - CP$	$x = CP - 448$

$$832 - CP = CP - 448 \\ 2CP = 1280 \\ CP = 640$$

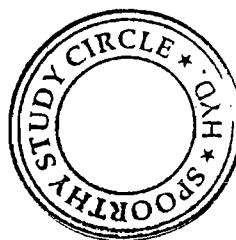
$$SP = 150\% CP \\ = \frac{3}{2} \times 640 \\ = 960$$

38) நம்மால்

$CP = 100 - 25$	$SP = 125 - 25$
$2x = 900 - CP$	$x = CP - 450$

$$2x = 900 - CP \\ 2(CP - 450) = 900 - CP \\ 2CP - 900 = 900 - CP \\ 3CP = 1800 \\ CP = 600$$

$$SP = 125\% CP \\ = \frac{5}{4} \times 600 \\ = 750$$



39) நம்மால்

$CP = 1920 - 48$	$SP = 1280 - 48$
$x = CP - 1280$	$x = SP - 1280$

$$1920 - CP = CP + 1280 \\ 2CP = 3200 \\ CP = 1600$$

$$SP = 125\% CP \\ = \frac{5}{4} \times 1600 \\ SP = 2000$$

40) 20% எடுத்து =  $\frac{1}{5} \times 5x = x$  எடுத்து

$CP = 1060 - SP$	$SP = 125 - 10$
$(6x = 1060 - SP) \times 5$	$(5x = CP - 950) \times 6$
$30x = 1060 \times 5 - 5SP$	$30x = 6CP - 950 \times 6$

$$1060 \times 5 - 5CP = 6CP - 950 \times 6$$

$$11CP = 1060 \times 5 + 950 \times 6$$

$$11CP = 5300 + 5700$$

$$11CP = 11000$$

$$CP = 1000$$

$$SP = 120\% CP$$

$$= 120 \times 1000$$

$$= 1200$$

41)  $\frac{3}{12} CP = \frac{2}{8} SP$

$$\frac{SP}{CP} = \frac{3}{2} \quad \text{1 பகுதி}$$

$$\text{ரூபாய்கள்} = \frac{1}{2} \times 100 = 50\% \uparrow$$

42)  $19CP = 16SP$

$$\frac{SP}{CP} = \frac{19}{16} \quad 3\frac{3}{4}\%$$

$$\text{ரூபாய்கள்} = \frac{3}{16} \times 100 \Rightarrow \frac{15}{4} \Rightarrow 18\frac{3}{4}\%$$

$$43) 50 \text{ SP} = 40 \text{ CP}$$

$$\frac{\text{SP}}{\text{CP}} = \frac{4}{5} \quad \text{15% Profit.}$$

$$\text{వస్తువుతో} = \frac{1}{5} \times 100 \\ = 20\% \text{ Loss.}$$

$$44) 110 \text{ SP} = 120 \text{ CP}$$

$$\frac{\text{SP}}{\text{CP}} = \frac{12}{11} \quad \text{15% Profit.}$$

$$= \frac{1}{11} \times 100 \Rightarrow 9\frac{1}{11}\%$$

$$45) 20 \text{ CP} = x \text{ SP}$$

$$\frac{\text{SP}}{\text{CP}} = \frac{20}{x} \quad (20-x) \text{ % Profit.}$$

$$\text{వాఫితో} = \frac{(20-x)}{x} \times 100 = 25,$$

$$80 - 4x = x$$

$$5x = 80$$

$$x = 16$$

$$46) \text{ నీవు వుధర} = 10 \text{ RS} \quad \text{అనుమతి.}$$

$$\text{shop} \Rightarrow 5 \text{ వుధర} + 1 \text{ వుధర} \cancel{\text{Free}} =$$

$$6 \text{ వుధర} = 60 \text{ RS}$$

$$\text{customer} \Rightarrow 5 \text{ వుధర} + \text{వుధర} \cancel{\text{Free}} =$$

$$5 \times 10 \text{ RS} + 0 = 50 \text{ RS}$$

$$\% \text{ క్లిష్టింగ్} = \frac{10 \text{ RS}}{60 \text{ RS}} \times 100 \\ = 16\frac{2}{3}\%$$

$$47) \text{ వాఫి} = 18 \text{ RS} - 12 \text{ RS}$$

$$3 \text{ CP} = 18 \text{ SP} - 18 \text{ CP}$$

$$3 \text{ CP} = 16800 - 18 \text{ CP}$$

$$21 \text{ CP} = 16800$$

$$\text{CP} = \frac{16800}{21} \Rightarrow 800 \text{ RS.}$$

$$48) \text{ వాఫి} = 18 \text{ RS} - 12 \text{ RS}$$

$$4 \text{ SP} \leftarrow \overbrace{12 \text{ SP} - 12 \text{ CP}}$$

$$12 \text{ CP} = 12 \text{ SP} - 4 \text{ SP}$$

$$12 \text{ CP} = 8 \text{ SP}$$

$$\frac{\text{SP}}{\text{CP}} = \frac{3}{2} \quad \text{15% Profit.}$$

$$\text{వాఫితో} = \frac{1}{2} \times 100 \doteq 50\%$$

$$49) \text{ వాఫి} = 17 \text{ RS} - 17 \text{ SP}$$

$$5 \text{ CP} = 17 \text{ SP} - 720 \text{ RS}$$

$$720 = 17 \text{ CP} - 5 \text{ CP}$$

$$720 = 12 \text{ CP}$$

$$\text{CP} = \frac{720}{12}$$

$$\text{CP} = 60$$

50)

$$\text{వాఫి} = 36 \text{ RS} - 36 \text{ SP}$$

$$4 \text{ SP} + 36 \text{ SP} = 36 \text{ CP}$$

$$40 \text{ SP} = 36 \text{ CP}$$

$$\frac{\text{SP}}{\text{CP}} = \frac{9}{10} \quad \text{15% Profit.}$$

$$\text{వాఫితో} = \frac{1}{10} \times 100 = 10\% \downarrow$$

51)

$$\frac{\text{CP}}{1 \text{ dozen}} = 16 \text{ RS}$$

$$2 \text{ dozen} = 16 \times 2 = 32 \text{ RS} = 1.5 \text{ dozen} \times 12 \text{ RS} +$$

$$0.5 \text{ dozen} \times 4 \text{ RS}$$

$$12 \text{ రూప్యాలు} = 18 \text{ RS} + 2 \text{ RS}$$

$$\text{వాఫి} = \frac{12}{32} \times 100$$

$$= 3 \left( \frac{100}{8} \right) = 3(12.5) \Rightarrow 37.5\%$$

52 వస్తువుల సమస్యల చేయండి

CP	SP
7 వస్తువుల 34RS	4 వస్తువుల 19RS
4 వస్తువుల 17RS	4 వస్తువుల 19RS

$$\frac{17}{2} \rightarrow 4 \text{ వస్తువుల}$$

$$45RS \rightarrow ? \quad \frac{45 \times 4}{2} = 90 \text{ వస్తువుల.}$$

53

CP	SP
(10 వస్తువుల 25RS) $\times 9$	(9 వస్తువుల 25RS) $\times 10$

$$\text{వస్తువుల సమస్యల చేయండి } [10, 9] = 90$$

90 వస్తువుల 225RS	90 వస్తువుల 250RS
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$$\frac{Sp}{Cp} = \frac{\frac{10}{25}}{\frac{9}{225}} \times \frac{10}{9} \text{ ఒకపాటి.}$$

$$\text{లాభశతం} = \frac{1}{9} \times 100 = \frac{1}{9} \%$$

54

CP	SP
(6 వస్తువుల 5RS) $\times 5$	(5 వస్తువుల 6RS) $\times 6$

$$\text{తెలిగు} = [6, 5] + 30$$

30 వస్తువుల 25RS	30 వస్తువుల 36RS
------------------	------------------

11 పథించి.

$$\begin{aligned} \text{లాభశతం} &= \frac{11}{25} \times 100 \\ &= 44 \%. \end{aligned}$$



55

CP	SP
16 వస్తువుల 24RS	(8 వస్తువుల 18RS) $\times 2$

$$\text{లాభశతం} = \frac{12}{24} \times 100 \Rightarrow 50\% \uparrow$$

56

$$[1, 8] \text{ లింగాను} = 56$$

CP	SP
(7 వస్తువుల 9RS) $\times 8$	(8 వస్తువుల 11RS) $\times 7$

$$56 \text{ v.} \parallel \quad 12RS$$

$$56 \text{ v.} \parallel \quad 77RS$$

లాభం వస్తువుల

$$5RS \rightarrow 56$$

$$10RS \rightarrow ? = \frac{10 \times 56}{5} = 112 \text{ వస్తువుల}$$

57

$$[3, 2] \text{ లింగాను} = 6$$

CP	SP
(3 వస్తువుల 1RS) $\times 2$	
(2 వస్తువుల 1RS) $\times 3$	
6 వస్తువుల 2RS	
6 వస్తువుల 3RS	6RS

$$12 \text{ వస్తువుల } 5RS$$

$$\begin{aligned} \text{20\% లాభం} &= \frac{1}{5} \\ &= \frac{1}{5} \times 5RS = 1RS \end{aligned}$$

$$(12 \text{ వస్తువుల}) \rightarrow 6RS$$

$$\text{dozen} \rightarrow 6RS.$$

58

CP	SP
(2 వస్తువుల 1RS) $\times 3$	
(3 వస్తువుల 2RS) $\times 2$	

Cp	Sp
(2 వ్యవస్థల 1Rs) $\times 3$	
వ్యవస్థల (3 వ్యవస్థల 2Rs) $\times 2$	(5 వ్యవస్థల 3Rs) $\times 12$
6 వ్యవస్థల 3Rs	60 వ్యవస్థల 36Rs
6 వ్యవస్థల 4Rs	
(12 వ్యవస్థల 7Rs) $\times 5$	
60 వ్యవస్థల 35Rs	1 రంగాలు 35 రూపాయితాతో.

$$\frac{35}{35} \times \frac{1}{7} \times 100 = \frac{20}{7} = 2\frac{6}{7}\%$$

Cp	Sp
1 dozen 10Rs	1 dozen 11Rs
1 dozen 8Rs	
2 dozen 18Rs	2 dozens 22Rs
	రంగాలు 4Rs.

రంగాలు సంఖ్య  
4Rs  $\rightarrow$  2 dozens

$$120Rs \rightarrow = \frac{120 \times 2}{4} = 60 \text{ dozens}$$

60 toffees  $\rightarrow$  1 Rs

$$1 \text{ Toffee} \rightarrow ? = \frac{1}{6} \text{ Rs.}$$

$$Cp 100\% \rightarrow \frac{1}{6} \text{ Rs.}$$

$$Sp 120\% \rightarrow ?$$

$$= \frac{120 \times \frac{1}{6}}{100} = \frac{1}{5} \rightarrow \frac{1}{5} \text{ వ్యవస్థల}$$

1 రంగాలు 5 వ్యవస్థల అవ్యాప్తి.

61 12 toffees  $\rightarrow$  1Rs  
1 Toffee  $\rightarrow ? = \frac{1}{12} \text{ Rs}$

$$80\% \rightarrow \frac{1}{12} \text{ Rs}$$

$$120\% \rightarrow ? = \frac{\frac{120}{12} \times \frac{1}{4}}{80} = \frac{1}{8} \rightarrow \frac{1}{8} \text{ రూపాయితాతో}$$

1 రంగాలు 8 వ్యవస్థలను అవ్యాప్తి.

62 45 lemons  $\rightarrow$  40Rs

$$1 \text{ lemon} \rightarrow ? = \frac{40}{45} = \frac{8}{9} \text{ Rs}$$

$$80\% \rightarrow \frac{8}{9} \text{ Rs}$$

$$120\% \rightarrow ? = \frac{\frac{120}{80} \times \frac{8}{9}}{3} = \frac{1}{3} \rightarrow \frac{1}{3} \text{ వ్యవస్థల}$$

4 రంగాలు  $\rightarrow$  3 lemons

$$24 \text{ రంగాలు} \rightarrow ? = \frac{24 \times 3}{4} = 18$$

63

$$\begin{array}{ll} n_1 & x_1 \\ 26 \text{ kgs} & 20 \text{ Rs} \\ n_2 & x_2 \\ 30 \text{ kgs} & 36 \text{ Rs} \end{array}$$

$$\text{సమాధానం} = \frac{n_1 x_1 + n_2 x_2}{n_1 + n_2}$$

$$= \frac{26 \times 20 + 30 \times 36}{26 + 30} = \frac{520 + 1080}{56}$$

$$= \frac{1600}{56} = \frac{200}{7}$$

Cp	Sp
$\frac{200}{7}$ Rs	30 Rs

$$\frac{Sp}{Cp} = \frac{30}{\frac{200}{7}} = \frac{210}{200} = \frac{21}{20} \rightarrow 13\frac{1}{2}\%$$

$$\text{రంగాలు} = \frac{1}{20} \times 100 = 5\%$$

OR

Cp | Sp

$$26 \text{ kgs } 20 \text{ Rs} = 520 \text{ Rs}$$

$$30 \text{ kgs } 36 \text{ Rs} = 1080 \text{ Rs}$$

1600 kgs

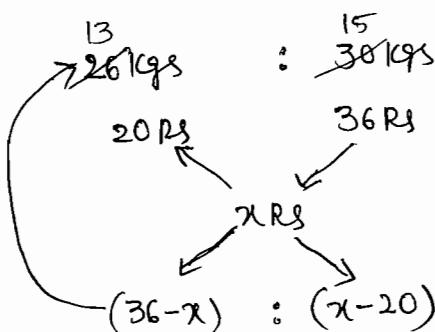
$$56 \text{ kgs } \times 30 \text{ Rs} = 1680$$

80 Rs per kg

$$= \frac{5}{1600} \times 100 \Rightarrow 5\%$$

OR

Allegation method



$$= \frac{36-x}{x-20} \times \frac{13}{15}$$

$$= 540 - 15x = 13x - 260$$

$$= \frac{28x}{7} = \frac{200}{200}$$

$$x = \frac{200}{7}$$

$$\frac{Sp}{Cp} = \frac{30}{\frac{200}{7}} = \frac{210}{200} = \frac{21}{20} \text{ अर्थात् } 105\%.$$

$$\text{लाभ} = \frac{1}{25} \times 100 = 5\%.$$

$$64) \bar{\text{व्यापक दूरी}} = \frac{n_1 x_1 + n_2 x_2}{n_1 + n_2}$$

$$= \frac{30 \times 11.5 + 20 \times 14.25}{30 + 20}$$

$$= \frac{345 + 285}{50} = \frac{630}{50}$$

$$\bar{\text{व्यापक दूरी}} = \frac{63}{5}$$

Sp = 130% Cp

$$= \frac{130}{100} \times \frac{63}{5} = \frac{819}{50 \times 2} = \frac{1638}{100}$$

$$\Rightarrow 16.38 (\text{लाभ})$$

(65)

30 kgs

17.5 Rs

(15.5 - x)

30 kgs

x Rs

2

120% → 18.6

100% → ?

= 100 \times 18.6

\frac{120}{100}

= \frac{186}{120}

= \frac{31}{20}

= \frac{31}{2} = 15.5

$$\frac{15.5 - x}{2} \times \frac{1}{1}$$

$$15.5 - x = 2$$

$$x = 15.5 - 2 \Rightarrow x = 13.5$$

(66)

2 : 4 : 3

n<sub>1</sub>    n<sub>2</sub>    n<sub>3</sub>

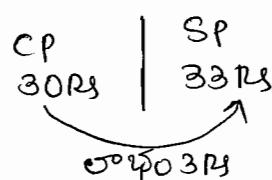
$$50 \text{ Rs} \quad 20 \text{ Rs} \quad 30 \text{ Rs}$$

$$x_1 \quad x_2 \quad x_3$$

$$\bar{\text{व्यापक दूरी}} = \frac{n_1 x_1 + n_2 x_2 + n_3 x_3}{n_1 + n_2 + n_3}$$

$$= \frac{2 \times 50 + 4 \times 20 + 3 \times 30}{2 + 4 + 3}$$

$$= \frac{100 + 80 + 90}{9} = \frac{270}{9} = 30.$$



$$\text{लाभ} = \frac{3}{30} \times 100 = 10\% \uparrow$$

(67)

प्रायः

6.4 Rs/Lit

$\frac{64}{10}$  Rs

प्रति

0 Rs

$\frac{64}{11}$  Rs

64 - 0

$\frac{64}{11}$

$$64 - 0 : \frac{64}{10} - \frac{64}{11}$$

$$\frac{64}{11} : \frac{64}{110} \left( \frac{11-10}{110} \right) = \left( \frac{1}{11} : \frac{1}{110} \right) \times 10 = 1 + \frac{3}{8} = \frac{11}{8}$$

ప్రాయః నీపు = 10 : 1  
నీపు : ప్రాయః 1 : 10

68)

మొత్తం	— రూప్తం
2 Kgs	3 Kgs
200 Rs	x Rs

$118\% \cdot x = 177$

$\frac{118}{100} \times x = 177 \quad (59 \times 2, 59 \times 3)$

$x = 150$

$$\text{వర్ణనాధర} = \frac{n_1 x_1 + n_2 x_2}{n_1 + n_2}$$

$$150 = \frac{2 \times 200 + 3 \times x}{2+3}$$

$\boxed{150 = \frac{400 + 3x}{5}}$

$$150 = \frac{400 + 3x}{5}$$

$$750 = 400 + 3x$$

$$350 = \frac{3x}{116.66}$$

$x = \frac{350}{3}$

$$x = 116.66$$

69) ఏ వస్తువు?

విలువు	విలువు
Cp	SP
$40n + 3000$	$60n$

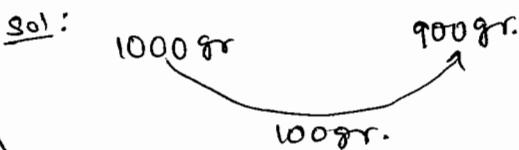
రాఫ్టో = 4.3 - 3.3  
 $1000 \text{Rs} = 60n - (40n + 3000)$   
 $1000 \text{Rs} = 60n - 40n - 3000$   
 $\downarrow (+)$   
 $20n = 4000$   
 $n = 200$

concept

### Dishonest Dealer (అశాంకించుటానికి)

$$\text{formula} = \frac{\text{అప్పుడు వస్తువు}}{\text{అప్పుడు వస్తువు}} \times 100$$

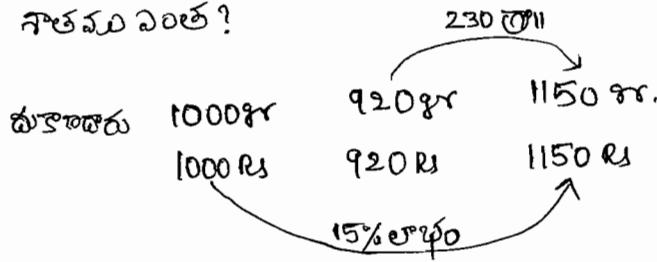
Q1) ఒక వెనంచేసే వ్యాపారి 1 kg కి బచుటగే 900 రూప్తలు తూర్పు దోషాద్యుమ్మి అని లాభస్తంపుత?



$$\text{రాఫ్టో = } \frac{\text{అప్పుడు వస్తువు}}{\text{అప్పుడు వస్తువు}} \times 100$$

$$= \frac{100}{900} \times 100 = 11.11\%$$

Q2) ఒక వెనంచేసే వ్యాపారి 1 kg కి బచుటగే 920 gr. తూర్పు వాటితూ, 1 kg కి వ్యాపారిల్లో 15% లాభంతో వస్తువు అప్పుస్తో, అతని ఉని లాభ సాతవమి ఎంత?

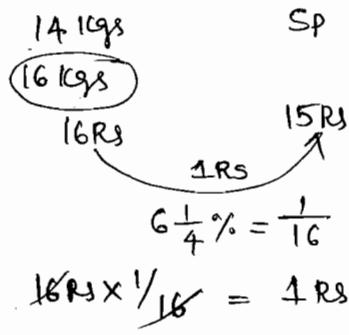


$$\text{రాఫ్టో = } \frac{\text{అప్పుడు వు}}{\text{అప్పుడు వు}} \times 100$$

$$= \frac{230}{920} \times 100 = \frac{25}{41} = 25\%$$

Q3 పొనటికీ వ్యవాధి 16 kg లక్ష బండులలో  
14 kg కు తూకం వాడుతూ, 16 kg లక్ష ఫర్మచెస్టు  
 $6\frac{1}{4}\%$  నిష్టత్వానికి అవ్యాతున్నానన్ Customer  
ను నమ్మబల్కాడు. అయితే గతి అసి లాభ  
క్షేత్రం ఎంత?

మరిందాడు 14 kg 16 kg  
14 Rs. 16 Rs.

Customer  
  
 $16 \text{Rs} \times \frac{1}{16} = 1 \text{Rs}$   
 $6\frac{1}{4}\% = \frac{1}{16}$   
 $16 \text{Rs} \times \frac{1}{16} = 1 \text{Rs.}$

Cp 14 kg వస్తువులు Sp 15 Rs అవ్యాతున్నాడు

$$\text{లాభశతం} = \frac{1}{14} \times 100 =$$

$$= 7.14\% \text{ or } 7\frac{1}{7}\%$$

R.S.-AGarwal Book

Q4 1 mtr = 100 cm 90 cm  
10 cm

$$\text{లాభశతం} = \frac{\text{గుర్తువు} - \text{గిమ్మనింపు}}{\text{గిమ్మనింపు}} \times 100$$

$$= \frac{10}{90} \times 100$$

$$= 11.11\% \uparrow$$

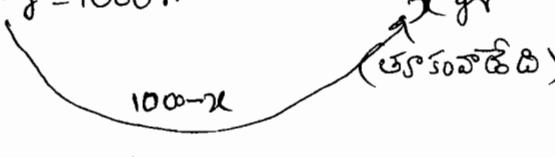


Q5 1 kg = 1000 gr 800 gr  
200 gr.

$$\text{లాభశతం} = \frac{\text{గుర్తువు} - \text{గిమ్మనింపు}}{\text{గిమ్మనింపు}} \times 100$$

$$= \frac{200}{800} \times 100$$

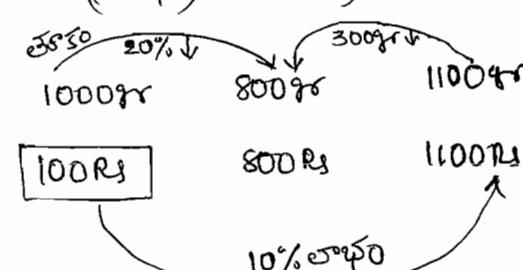
$$= 25\% \uparrow$$

Q2 1 kg = 1000 gr  
  
 $\text{లాభశతం} = \frac{\text{గుర్తువు} - \text{గిమ్మనింపు}}{\text{గిమ్మనింపు}} \times 100$   
 $6\frac{18}{47} = \frac{1000 - x}{x} \times 100$   
 $\frac{300}{47} = \frac{1000 - x}{x} \times 100$   
 $3x = 47000 - 47x$

Q3 CP 10% వ్యాసం | Sp 10% వ్యాసం  
 (11 వస్తువులు 10Rs) x 9 | (9 వస్తువులు 10Rs) x 11  
 99 వస్తువులు 90Rs | 99 వస్తువులు 110Rs  
 20 Rs.

$$\text{లాభశతం} = \frac{20}{90} \times 100$$

$$= 2 \left( \frac{100}{9} \right) = 2(11.11) \Rightarrow 22.22\%$$

Q4 మరిందాడు  
  
 $1000 \text{gr} \xrightarrow{-20\%} 800 \text{gr}$   
 $800 \text{gr} \xrightarrow{+300\%} 1100 \text{gr}$   
 $10\% \text{ లాభం}$

$$\text{లాభశతం} = \frac{\text{గుర్తువు} - \text{గిమ్మనింపు}}{\text{గిమ్మనింపు}} \times 100$$

$$= \frac{300}{800} \times 100$$

$$= 3(12.5\%) \Rightarrow 37.5\%$$

Q5 100Rs  $\xrightarrow{-20\%, -20\%}$  80Rs  $\xrightarrow{+10\%, +8\%}$  88Rs  
 వస్తువులు పోచువు  $\xrightarrow{-12\%}$  మగిలన వస్తువులు

$$\text{నెప్పశతం} = \frac{12}{100} \times 100$$

$$= 12\% \downarrow$$

76

$$x \times \frac{120}{100} \times \frac{125}{100} \times \frac{3}{4} = 225$$

$$x = 150$$

77 A కిందినథరు =  $x$  Rs (మరవ్వుత్తులమీడాటాలు)

$$x \times \frac{120}{100} \times \frac{90}{100} \times \frac{100}{100} = 1188$$

$$x = 1000$$

$$\begin{aligned} \text{A కిందిన అసలుథరు} &= 1000 - 110 \\ &= 890 \end{aligned}$$

78

$$\begin{array}{ccccccc} x & & 5\% \text{ లాఫో } & y & & 2\% \text{ నష్టి } & x \\ \text{అసలుథరు} & +7500 & \rightarrow & 1,57,500 & \rightarrow & 154350 & \\ 1,50,000 & & & & & & \end{array}$$

$$x \text{ గాం } = 1,57,500$$

$$\begin{array}{l} y \text{ తెగిచేసి } \\ \underline{\times \text{ గాం } - 3150} \end{array}$$

79

$$x \times \frac{118}{100} \times \frac{120}{100} \times \frac{125}{100} = 30.09$$

$$x \times \frac{118}{100} \times \frac{5}{6} \times \frac{5}{4} = \frac{30.09}{100}$$

$$x = 17$$

80

$$5.30 = SP = 144$$

$$CP = x \text{ Rs}, \text{ వాఫో profit} = x\%$$

$$SP = CP + \text{Profit}$$

$$144 = x + x\% x$$

Go with options.

$$= \frac{80 + 80\% \times 80}{100}$$

$$144 = 80 + 64$$

$$144 = 144$$

81

మరవ్వుత్తు థర్ సి.పి. = 150 Rs అన్నిటను

$$\text{ఇంఫర్ సి.పి.} = \frac{13}{15} \times SP = \frac{13}{15} \times 150 = 130 \text{ Rs}$$

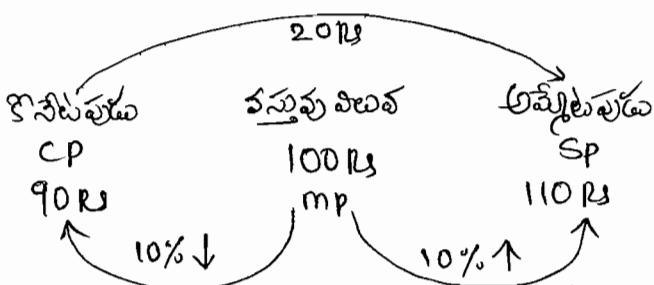
$$\Rightarrow \text{కొత్త థర్ మరవ్వు} SP_1 = 168 \text{ Rs}$$

$$\text{లాఫో} = 381 \text{ Rs}$$

$$\text{లాఫో} = \frac{38}{130} \times 100 = \frac{380}{13} = 29 \frac{3}{13}\%$$

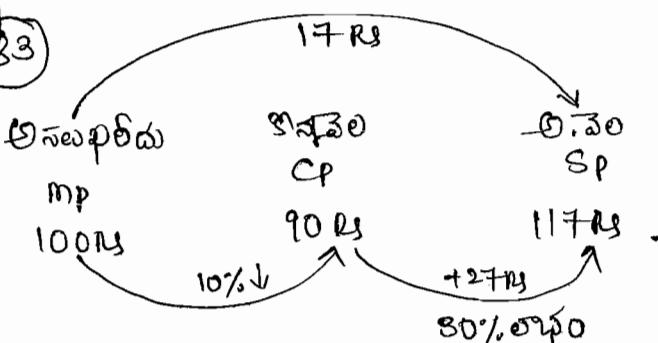
82

వస్తువు లివు 100 Rs అనుమతి.



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

$$= 22.22\% \text{ (OR)} 22 \frac{2}{9}\%$$



$$= \frac{17 \text{ Rs}}{100 \text{ Rs}} \times 100\%$$

$$= 17\%$$

84

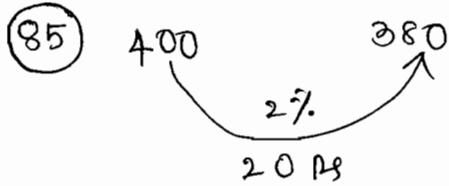
$$SP_1 = 340$$

$$SP_2 = 350$$

$$\begin{array}{c} 10 \text{ Rs} \\ 5\% \end{array}$$

$$5\% \rightarrow 10 \text{ Rs}$$

$$100\% \rightarrow ? = \frac{100 \times 10}{5} = 200$$

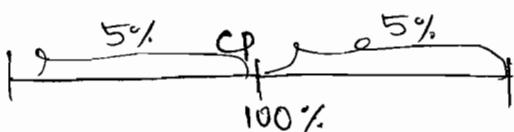


$$\frac{Sp_1}{Sp_2} = \frac{\frac{52}{104} \times CP}{\frac{53}{106} \times CP}$$

$$Sp_1 : Sp_2 = 52 : 53.$$

$$CP 100\% \rightarrow ? = \frac{100 \times 20}{2} = 1000 \text{ Rs}$$

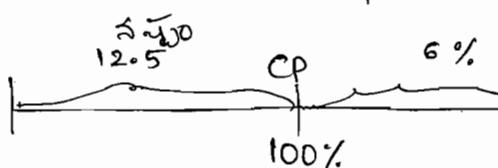
86



$$10\% \rightarrow 15$$

$$CP 100\% \rightarrow ? = \frac{100 \times 15}{10} = 150 \text{ Rs.}$$

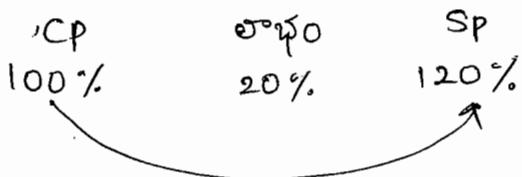
87



$$18.5 \rightarrow 51.8$$

$$100\% \rightarrow ? = \frac{100 \times 51.8}{18.5} = 280 \text{ Rs}$$

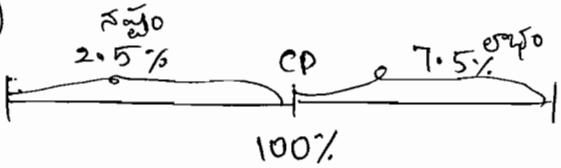
88



$$20\% \rightarrow 240$$

$$Sp 120\% \rightarrow ? = \frac{120 \times 240}{20} = 1440$$

89



$$10\% \rightarrow 100 \text{ Rs}$$

$$Sp 112.5\% \rightarrow ? = \frac{112.5 \times 100}{10} = 1125 \text{ Rs.}$$

90

$$Sp_1 = 104\% CP$$

$$Sp_2 = 106\% CP$$

Concept

$$CP_1 = CP_2$$

⑤ పండున్నిటి లభితా 2000 రూలో వెంటి  
20%↑, పొద్ది 20%↓ అవుతో మొత్తం ఏదు  
అధిక/నుహ కుతో ఐటి)

$$CP_1 = 2000$$

$$Sp_1 = 120\% CP$$

$$Sp_1 = 2400$$

$$CP_2 = 2000$$

$$Sp_2 = 80\% CP_2$$

$$Sp_2 = 1600$$



$$\text{మొత్తం } CP = CP_1 + CP_2 = 2000 + 2000 = 4000$$

$$\text{మొత్తం } Sp = Sp_1 + Sp_2 = 2400 + 1600 = 4000$$

No profit No loss.

$$CP_1 = CP_2 \quad x\% \uparrow, x\% \downarrow \text{ over all}$$

No profit/No loss

6

$$Sp_1 = Sp_2$$

పండున్నిటి లభితా 960 రూలో పునర్వ్యాప వెంటి

20%↑, పొద్ది 20%↓ వ్యాప మొత్తం ఏదు

అధిక నుహ మా?

$$Sp_1 = 960$$

$$Sp_1 = 120\% CP_1$$

$$960 = \frac{120}{100} \times CP_1$$

$$CP_1 = 800$$

$$Sp_2 = 960$$

$$Sp_2 = 80\% CP_2$$

$$960 = \frac{80}{100} \times CP_2$$

$$CP_2 = 1200$$

$$\text{మొత్తం } CP = CP_1 + CP_2 = 800 + 1200 = 2000$$

$$\text{మొత్తం } Sp = Sp_1 + Sp_2 = 960 + 960 = 1920$$

$$\text{నుహ} = \frac{1920 - 2000}{2000} \times 100 = 4\% \downarrow$$

$$Sp_1 = Sp_2 \quad x\% \uparrow, x\% \downarrow = \frac{x^2}{100} \% \downarrow$$

91

$$Sp_1 = Sp_2 = 308$$

$$12\% \uparrow 12\% \downarrow = 308$$

$$\begin{aligned} x\% \uparrow & \quad x\% \downarrow = \frac{x^2}{100}\% \downarrow \\ & = \frac{12^2}{100}\% \downarrow \\ & = \frac{144}{100}\% \downarrow \\ & = 1\frac{11}{25}\% \end{aligned}$$

92

$$Sp_1 = Sp_2 = 1.995 \text{ Lakhs}$$

$$5\% \uparrow = 5\% \downarrow$$

$$\begin{aligned} x\% \uparrow & = x\% \downarrow = \frac{x^2}{100}\% \downarrow \\ & = \frac{5^2}{100}\% \downarrow \\ & = \frac{25}{100} = \frac{1}{4} \downarrow \\ & = 0.25\% \downarrow. \end{aligned}$$

93

$$Sp_1 = 4000$$

$$Sp_1 = 125/CP_1$$

$$4000 = \frac{51}{4} CP_1$$

$$CP_1 = 3200$$

$$\text{Total } Sp = Sp_1 + Sp_2 = 4000 + 4000 = 8000$$

$$\text{Total } Cp = Cp_1 + Cp_2 = 8000$$

$$3200 + Cp_2 = 8000$$

$$Cp_2 = 4800$$

$$\text{Ans : } 16.66\% \text{ or } 16\frac{2}{3}\%$$

94

$$Sp_1 = 1 \text{ Lakh}$$

$$Sp_1 = 80\% CP_1$$

$$1L = \frac{4}{5} \times CP_1$$

$$CP_1 = \frac{5}{4}$$

$$Sp_2 = 1 \text{ Lakh}$$

$$Sp_2 = 120\% CP_2$$

$$1 = \frac{6}{5} \times CP_2$$

$$CP_2 = \frac{5}{6}$$

$$\text{Total } Cp = CP_1 + CP_2 = \frac{5}{4} + \frac{5}{6}$$

$$= \frac{15+10}{12} = \frac{25}{12} \text{ Lakhs.}$$

$$Sp_1 = Sp_2$$

$$20\% \uparrow = 20\% \downarrow \text{ Overall } 4\% \downarrow$$

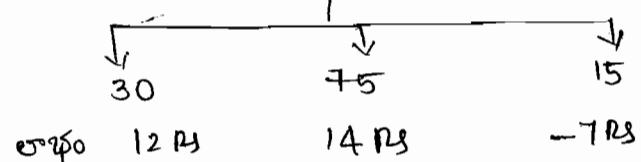
$$\text{Loss} = 4\% \cdot \frac{25}{12} \text{ Lakhs}$$

$$= \frac{40}{100} \times \frac{25}{12} = \frac{1}{12} \text{ Lakhs.}$$

95

110R கூடுதல்

120வற்றுல்

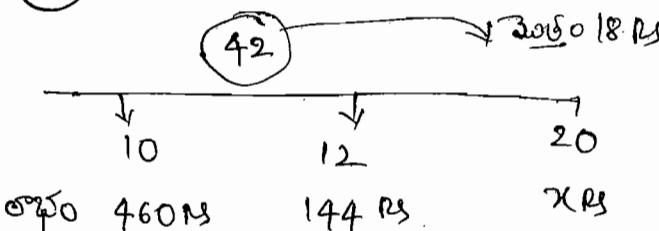


$$\text{மொத்தமாக } \frac{\text{எல்லா}}{\text{ஒரு}} = (30 \times 12) + (14 \times 15) = (1 \times 15)$$

$$360 + 1050 - 105 = 1305$$

$$\text{ஏங்கள் } \frac{1305}{120} = \frac{10.87}{8} = 10.8$$

96



$$\begin{aligned} \text{மொத்தமாக } & = 42 \times 18 \\ & = 756 \end{aligned}$$

$$460 + 144 + x = 756$$

$$604 + x = 756$$

$$x = 152$$

$$20 - \text{ఫో} @ \rightarrow 152$$

$$1 - \text{ఫో} \rightarrow = \frac{1 \times 152}{20} = 7.6$$

97

$$\begin{array}{ccc} \frac{2}{8} \text{ dozens} & : & \frac{3}{12} \text{ dozens} \\ +10 & : & +20 \\ x & & \\ (20-x) & : & (10-x) \end{array}$$

$$\frac{20-x}{10-x} \times \frac{2}{3}$$

$$60 - 3x = 20 - 2x - 20$$

$$5x = 80$$

$$x = \frac{80}{5} = 16$$



98

$$\begin{array}{ccc} \frac{3}{4} & : & \frac{1}{4} \\ -10\% & : & +10\% \\ x & & \\ (10-x) & : & (x+10) \end{array}$$

$$\frac{10-x}{x+10} \times \frac{3}{1}$$

$$10-x = 3x + 30$$

$$4x = -20$$

$$x = \frac{-20}{4}$$

$$x = -5\%, 108.$$

99

$$\begin{array}{ccc} \frac{2}{3} & : & \frac{1}{3} \\ +20 & & +14 \\ x & & \\ (x-14) & : & (20-x) \end{array}$$

$$\frac{x-14}{20-x} \times \frac{2}{1}$$

$$x-14 = 40-2x$$

$$3x = 54$$

$$x = \frac{54}{3} = 18$$

100

400 cloths (అందులు 400RS లను)

200 cloths	100 cloths	100 cloths
200RS	100RS	100RS
20% లాభం	20% నెప్పు	కొన్సంధి

$$0.30 = 204 + 804 + 1004 = 420RS$$

$$\text{లాభస్థత} = \frac{20}{400} \times 100 \Rightarrow 5\% \uparrow.$$

101

ఒత్తింకిలురు = x RS

90x	
40x	50x
10% లాభం	20% లాభం

$$\text{సమయ} = 110\% 40x + 120\% 50x$$

$$\text{సమయ} = 44x + 60x \quad \checkmark 15\% \text{ లాభం}$$

$$= 104x$$

$$= 115\% 90x$$

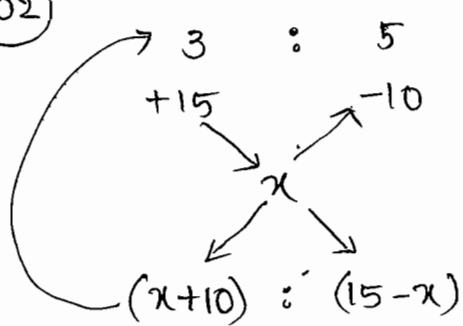
$$= 103.5x$$

$$\text{తేలు} = 0.5x$$

$$\Rightarrow 0.5x = 40RS$$

$$\frac{x}{2} = 40 \Rightarrow x = 80 RS$$

102



$$\frac{x+10}{15-x} \times \frac{3}{5}$$

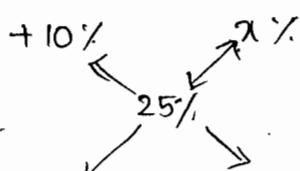
$$5x+50 = 45-3x$$

$$8x = -5$$

$$x = \frac{-5}{8}\% \text{ Loss}$$

103

$$\frac{1}{3000} : \frac{1}{3000}$$



$$(x-25) : (25+10)$$

$$x-25 : 15$$

$$\frac{x-25}{15} \times \frac{1}{1}$$

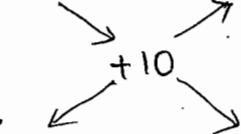
$$x-25 = 15$$

$$x = 40\%$$

104

$$\text{পাখো} : \text{সূজো}$$

$$+20 \quad \quad \quad -5$$

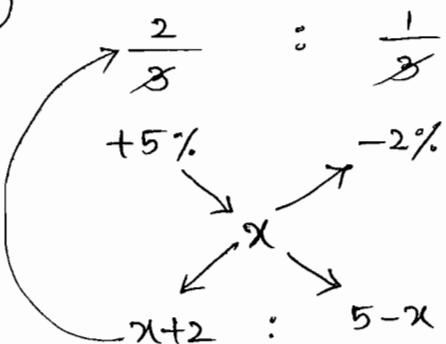


$$\frac{15}{3} : \frac{10}{2}$$

$$\text{নেতৃত্ব গ্রহণ সময়} = \frac{2}{5} \times 24$$

$$= \frac{48}{5} = 9.6 \text{ kg.}$$

105



$$\frac{x+2}{5-x} \times \frac{2}{1}$$

$$10-2x = x+2$$

$$3x = 8$$

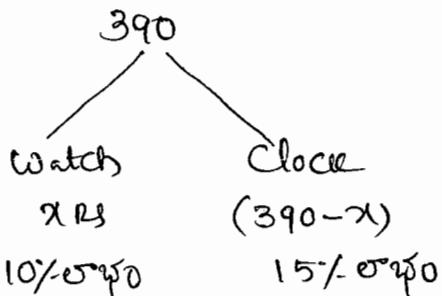
$$x = \frac{8}{3}\%$$

$$\frac{8}{3}\% x = 400$$

$$\frac{8}{3} \times \frac{1}{100} x = \frac{5}{100}$$

$$x = 15000$$

106



$$10\% x + 15\% (390-x) = 51.5$$

$$10\% x + 15\% 390 - 15\% x = 51.5$$

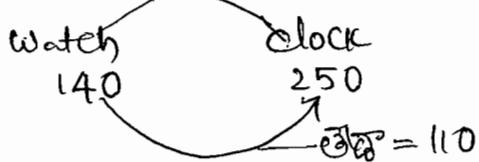
$$-5x + 58.5 = 51.5$$

$$5\% x = 7$$

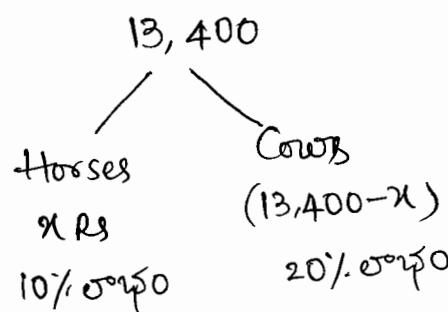
$$\frac{5}{100} x = 7$$

$$x = 140$$

390



(107)



$$10\% x + 20\% (13,400 - x) = 1880$$

$$10\% x + 20\% (13,400 - x) = 1880$$

$$(-) \quad (+)$$

$$-10\% x + 2680 = 1880$$

$$(-) \quad (+)$$

$$10\% x = 800$$

$$\frac{1}{10} x = 800$$

$$\text{సర్వాంగం } x = 8000$$

$$\Delta \text{ సర్వాంగం} = \frac{8000}{4} = 2000$$

(108)

$$650 \rightarrow \begin{cases} A \\ B \end{cases}$$

$$Sp_1 = 120\% CP_1 \quad Sp_2 = 15\% CP_2$$

$$Sp_1 = Sp_2$$

$$120\% CP_1 = 15\% CP_2$$

$$24\%$$

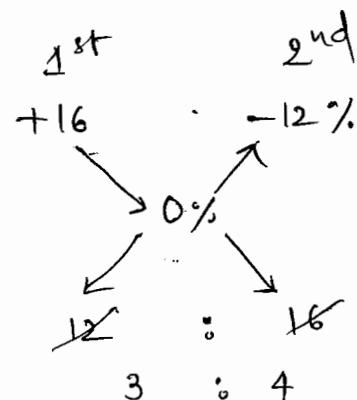
$$\frac{CP_1}{CP_2} = \frac{5}{8}$$

$$CP_1 : CP_2 = 5 : 8$$

$$CP_1 = \frac{5}{13} \times 650 = 250$$

$$CP_2 = \frac{8}{13} \times 650 = 400$$

(109)



$$1^{\text{st}} = \frac{3}{7} \times 840 = 360$$

$$2^{\text{nd}} = \frac{4}{7} \times 840 = 480$$

(110)

$$+ \begin{array}{r} -7\% c + 17\% t = 296 \\ 7\% c + 12\% t = 400 \\ \hline 29\% t = 696 \end{array}$$

$$\frac{29}{100} t = \frac{696}{24}$$

$$t = 2400$$



**ముద్దుషాపాల [Marked price]**

Q: ఒక వర్కుడు 10% డిసైల్ రూప్యాంగాలలో 10% లాఫు వస్తుంది. తీవ్రంగా 450 పుఅర్త మరుచుపెల ఎంత?

A: మరుచుపెల్లి 10% డిసైల్ రూప్యాంగాల, తీవ్రంగా 10% లాఫు వస్తుంది.

$$Sp = 90\% mp \quad | \quad Sp = 110\% CP$$

$$90\% mp = 110\% CP$$

$$9 mp = 11 CP$$

$$9 mp = 11 \times \frac{5}{4} CP$$

$$mp = 550$$

(III)  $m_p = 650$

$$\text{Discount } 25\% = -16.25$$

$$\begin{array}{r} 650 \\ - 160.25 \\ \hline 633.75 \end{array}$$

$$\begin{aligned}
 & 112 \quad 2,72\,000 = 2,00,000 + 72,000 \\
 & \quad \quad \quad -4\% \downarrow \quad -20.5\% \downarrow \\
 & \quad \quad \quad -8000 \quad -1800 \\
 \\ 
 & = 1,92,000 + 70,200 \\
 \\ 
 & = 2,62,200
 \end{aligned}$$

$$\textcircled{113} = 1400 \times \frac{8\phi}{100} \times \frac{9\phi}{1\phi\phi}$$

$$= 14 \times 72$$

$$= 1008$$

(114)

$$= \frac{3}{\frac{80}{68}} x + 0.4 \Rightarrow 15$$

115

$\frac{\text{ముద్దు}}{mP_1} = x$	$\frac{\text{ముద్దు}}{mP_2} = x$
----------------------------------	----------------------------------

$100\% - 15\% = 85\%$

$$85\% \quad 2x = 37.4$$

$$\frac{85}{100} \times 2x = \frac{374}{100}$$

$$\begin{array}{r} 100 \\ \cancel{85} \cancel{\times} \\ \hline 1 \end{array} \quad \begin{array}{r} 22 \\ \cancel{374} \\ \hline 10 \end{array}$$

$$117 \quad x \text{ ප්‍රතිඵලීය හෝඩ් } \\ 1500 \times \frac{80}{100} \times \frac{100-x}{100} = 1104 \\ 100 - x = 92 \\ x = 8$$

(118)  $\frac{3}{5}\% x = \frac{4}{20}\% y$

## Growth options - C

~~86~~ : ~~86~~  
4 : 3

4 : 3

(119) கூடுதல் ரீதி = 100%.

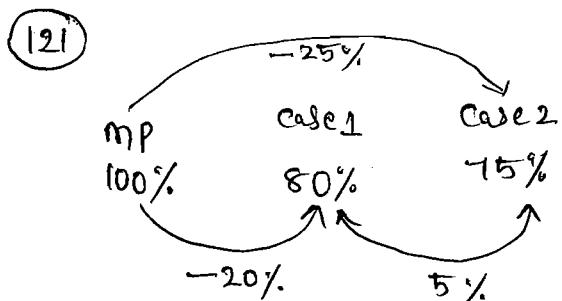
$$20\% \downarrow \quad 80\% \rightarrow 24 \text{ Rs}$$

$$30\% \downarrow \quad 70\% \rightarrow ? = 21 \text{ Rs.}$$

$$= \frac{70}{100} \times 24 = 21 \text{ Rs.}$$

$$MP \times \frac{100-x}{100} = y$$

$$mp = \frac{100y}{100-x}$$



$$100\% \rightarrow = \frac{100 \times 500}{5} = 10,000$$

122

$$(i) 100 \xrightarrow{-20\% \downarrow} 80 \text{ Rs} \xrightarrow{-30\% \downarrow} 56.$$

$-20 \text{ Rs}$

$-24 \text{ Rs}$

$44\% \downarrow$

$$(ii) 100 \times \frac{80}{100} \times \frac{70}{100} = 56$$

$44\% \downarrow$

$$(iii) \text{मूल राशि का अवृत्ति} = a + b + \frac{ab}{100}$$

$$a = -20, b = -30$$

$$= -20 - 30 + \frac{-20 \times -30}{100}$$

$$= -50 + 6$$

$$= -44\% \downarrow$$

123

 $10\% \downarrow, 12\% \downarrow, 15\% \downarrow$ 

$$\begin{aligned} &= a + b + \frac{ab}{100} \\ &= -10 - 12 + \frac{-10 \times -12}{100} \\ &= -22 + 1.2 \\ &= -20.8 \end{aligned} \quad \begin{aligned} &= a + b + \frac{ab}{100} \\ &= -20.8 - 15 + \frac{-20.8 \times -15}{100} \\ &= -35.8 + 3.12 \\ &= -32.68 \end{aligned}$$

124

$$(i) 2000 \xrightarrow{-20\% \downarrow} 1600 \xrightarrow{-10\% \downarrow} 1440$$

$-400$

$-160$

$$(ii) 2000 \times \frac{80}{100} \times \frac{90}{100} = 1440$$

125

$$80 \text{ Rs} \xrightarrow{-5\% \downarrow} 76 \text{ Rs} \xrightarrow{-5\% \downarrow} 72.2 \text{ Rs}$$

$-4 \text{ Rs}$

$-3.8$

OR

$$80 \times \frac{19}{100} \times \frac{19}{100} = \frac{361}{5} = 72.2$$

$\frac{19}{20} \cdot \frac{20}{5}$

126

$$12000 \xrightarrow{-15\% \downarrow} 10200 \xrightarrow{-10\% \downarrow} 9180 \xrightarrow{-5\% \downarrow} 8721$$

$-1800$

$-1020$

$9180$

$8721$

OR

$$= 12000 \times \frac{17}{85} \times \frac{90}{100} \times \frac{95}{100}$$

$\frac{3}{4}$

$$= 3 \times 17 \times 9 \times 19$$

$$= 8721$$

127

$$x \times \frac{88}{100} \times \frac{95}{100} = 209$$

$\frac{8}{50}$

$\frac{5}{5}$

$$x = 50 \times 5 \Rightarrow 250$$

128

$$40\% \quad \text{---} \quad -36\%, -4\%$$

$$\text{Overall} = a + b + \frac{ab}{100}$$

$$= -36 - 4 + \frac{-36 \times -4}{100}$$

$$= -40 - 1.44$$

$$\text{अंकित} = 1.44\%$$

$$\text{अंकित} = 1.44\% \text{ } 1,00,000$$

$$= 1440$$

129

Bill में 100% अवृत्ति है।



$$-35\% \quad \text{---} \quad -20\%, -20\%$$

$$\text{Overall} = a + b + \frac{ab}{100}$$

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

$$= -40 + 4$$

$$= -36\%$$

$$\text{अंकित} = 1\%$$

$$1 \rightarrow 22\% \\ 100\% \rightarrow 2200$$

130

మొదటివారు	దొర్చివారు
$-30\%, -6\%$	$-20\%, -16\%$
$= a+b + \frac{ab}{100}$	$= a+b + \frac{ab}{100}$
$= -30-6 + \frac{-30 \times -6}{100}$	$= -20-16 + \frac{-20 \times -16}{100}$
$= -36+1.8$	$= -36+3.2$
తేడా $10.4\%$	
$= 10.4\% \text{ off}$	
$= 9.8 \text{ Rs.}$	

131

దొర్చి తినిలో  $x\%$ , ఉన్నావువం.

$$120 \times \frac{90}{100} \times \frac{100-x}{100} = 550.8$$

$$\begin{array}{rcl} 8 & & 85 \\ 72 \times 9 \times (100-x) & = & 55080 \\ & & \downarrow 680 \quad 2 \\ & & 6120 \\ 100-x & = & 85 \end{array}$$

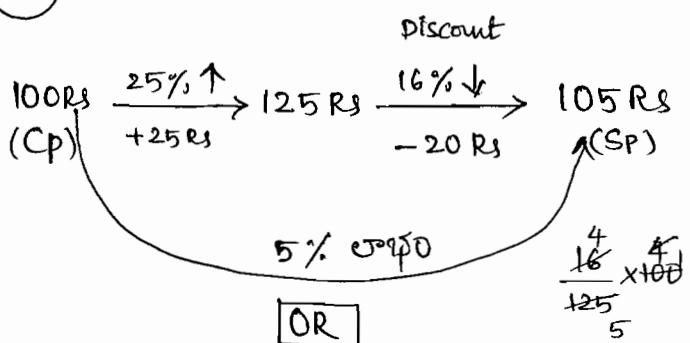
$$x = 15\%$$

132

CP	SP
$\delta = 150 \times 250 \text{ Rs} = 37500$	$MP = 320 \text{ Rs}$
$\text{trasport} \quad 2500$	$\text{discount } 5\% \quad \frac{16}{304 \text{ Rs}}$
$\frac{37500 + 2500}{40,000}$	$Sp = 150 \times 304 \text{ Rs}$
$\text{తేడా } = 5600$	

$$\begin{aligned} &= \frac{5600}{40000} \times 100 \\ &= 14\%. \end{aligned}$$

133



$$\begin{aligned} &= a+b + \frac{ab}{100} \\ &= 25-16 + \frac{25 \times -16}{100} \\ &\Rightarrow 9-4 \\ &\Rightarrow 5\% \end{aligned}$$

134



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

$$= 30-6.25 + \frac{30 \times -6.25}{100}$$

$$= 23.75 - 1.875$$

$$= 21.875$$

$$\begin{array}{r} 23.75 \\ 1.875 \\ \hline 21.875 \end{array}$$

135

 $30\% \uparrow, 10\% \downarrow, 10\% \downarrow$ 

$$\begin{aligned} &= a+b + \frac{ab}{100} \\ &= 30-10 + \frac{30 \times -10}{100} \\ &= 20-3 \\ &= 17 \\ &= 5.3 \end{aligned}$$

so, increased by  $5.3\%$ 

136

wholesale	Retailer
$30 \text{ వ్యాపారం } = 27 \text{ Rs}$	$4 \text{ వ్యాపారం }$
$1 \text{ వ్యాపారం }$	$1 \text{ Rs}$
$30 \text{ వ్యాపారం }$	$30 \text{ Rs}$

$$\text{margin} = \frac{31}{279} \times 100 \Rightarrow 11.11 / 11.\overline{1} \text{ Rs.}$$

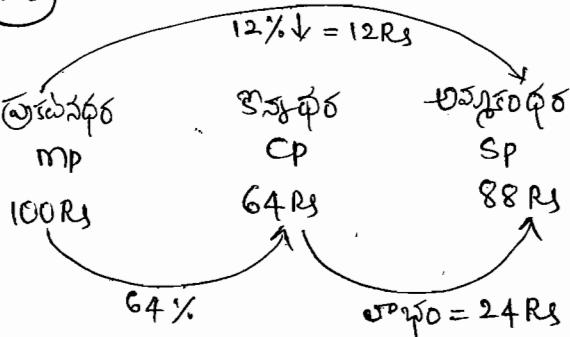
(137)

$$\begin{array}{l}
 MP = 300 \text{ Rs} \\
 SP = 120\% \text{ CP} \\
 \frac{50}{300} = \frac{6}{5} \times CP \\
 CP = 250 \text{ Rs}
 \end{array}
 \quad
 \begin{array}{l}
 MP = 300 \text{ Rs} \\
 \text{Discount } 10\% = -30 \text{ Rs} \\
 SP = 270 \text{ Rs}
 \end{array}$$

20% लाभ

$$\text{लाभ प्रतिशत} = \frac{20}{250} \times 100 \Rightarrow 8\%$$

(138)



$$\text{लाभ प्रतिशत} = \frac{24}{88} \times 100 = 27.27\%$$

(139)

$$x \times \frac{90}{100} \times \frac{108}{100} = 680.40$$

$$x \times \frac{90}{100} \times \frac{108}{100} = \frac{7567}{10}$$

$$x = 700$$

(140)  $a = x\% \uparrow, b = 10\% \downarrow, \text{Overall} = 20\% \uparrow$ 

$$= a + b + \frac{ab}{100} = 20$$

$$x - 10 + \frac{x \times -10}{100} = 20$$

$$x - \frac{x}{10} = 30$$

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

$$x = \frac{100}{3} \Rightarrow 33\frac{1}{3}\%$$

(141)  $a = x\% \uparrow, b = 20\% \downarrow, \text{Overall} = 25\% \uparrow$ 

$$a + b + \frac{ab}{100} = 25$$

$$x - 20 + \frac{x \times -20}{100} = 25$$

$$x - \frac{x}{5} = 45$$

$$\frac{4x}{5} = 45$$

$$x = \frac{225}{4}\%$$

$$\text{प्राप्त धन} = \frac{225}{4} \times \frac{1}{100} \times 1200 \\ = 675$$

$$\text{कुल व्यय} = 1200 + 675 = 1875 \text{ Rs.}$$

(142)  $SP = 90\% MP \quad | \quad SP = 112\% CP$ 

$$90\% MP = 112\% CP$$

$$45 MP = 56 CP$$

$$\frac{CP}{MP} = \frac{45}{56}$$

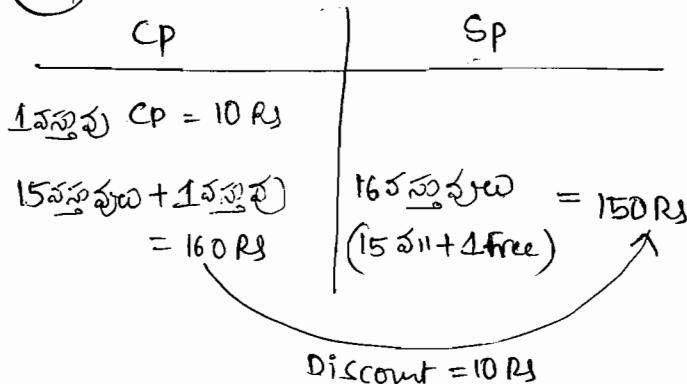
(143)  $SP = \frac{2}{5} MP \quad | \quad SP = 75\% CP$ 

$$SP = \frac{3}{4} CP$$

$$\frac{2}{5} MP = \frac{3}{4} CP$$

$$\frac{MP}{CP} = \frac{3}{4} \times \frac{5}{2} \Rightarrow \frac{15}{8}$$

(144)



$$\text{Discount} = \frac{10 \text{ Rs}}{16.5 \text{ Rs}} \times 100 \\ = 6.25\% \downarrow$$

116

$$100 \text{Rs} \quad x\% \uparrow \quad 4\% \downarrow \quad (6.25\% \downarrow) = 135 \text{Rs}$$

$$100 \times \frac{100+x}{100} \times \frac{96}{100} \times \frac{15}{16} = 135$$

$$100+x = 150$$

$$x = 50$$

145

$a = 10\% \uparrow, b = x\% \downarrow, \text{Overall} = 1\% \downarrow$

$$a+b+\frac{ab}{100} = -1$$

$$10-x + \frac{10x-x}{100} = -1$$

$$-x - \frac{x}{100} = -11$$

$$-\frac{11x}{10} = -11$$

$$x = 10$$

OR

$$100 \times \frac{100+x}{100} \times \frac{100-x}{100} = 99$$

$$100-x = 90$$

$$x = 10$$

146

$$100 \text{Rs} \times \frac{135}{100} \times \frac{100-x}{100} = 108 \text{Rs}$$

$$100-x = 80$$

$$x = 20$$

OR

$a = 35\% \uparrow, b = x\% \downarrow, \text{Overall} = 8\% \uparrow$

$$= a+b+\frac{ab}{100} = 8$$

$$= 35-x + \frac{35x-x}{100} = 8$$

$$= \frac{24x}{20} = -24 \Rightarrow x = 20$$

147 400 Clothes CP = 400 Rs  
 $\downarrow 20\% \uparrow \text{వ్యాప్తి}$   
 $MP = 480 \text{Rs.}$

400 Clothes (400 Rs)

200 clothes	100 clothes	100 clothes
CP 200 Rs	CP = 100 Rs	CP = 100
MP 240 Rs	MP 120 Rs	$+10\% \rightarrow MP = 120 \text{Rs}$
SP = 240 Rs	SP = 96 Rs	$20\% \downarrow \rightarrow SP = 72 \text{Rs}$

$$SP = 240 + 96 + 72 \Rightarrow 408 \text{Rs.}$$

$$CP = 400 \quad SP = 408$$

$$\frac{8}{400} \times 100 \Rightarrow 2\%$$

148 SP = 90% MP |  $\frac{SP}{MP} \times \frac{CP}{CP}$   
~~Profit = 70Rs~~ CP = ?

so, E Question Cannot Determine.

149 SP = 95% MP | SP = 115% CP  
~~95% MP = 115% CP~~

$$19 MP = 23 CP$$

$$19 \times 6500 = 23 CP$$

$$CP = \frac{19 \times 6500}{23} \quad \frac{23 \times 6500(282)}{46}$$

$$= 19 \times 282$$

$$= 5358$$

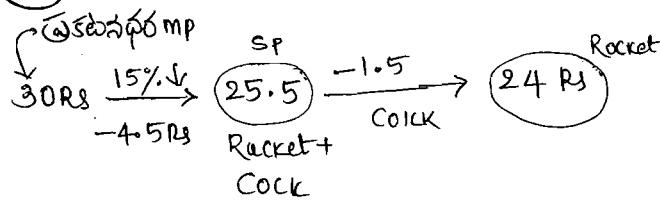
150  $20\% \uparrow$

మాన్యమార్కు	మాన్యమార్కు	ఇలాట్ మార్కు
100 Rs	85 Rs	120 Rs
$15\% \downarrow$		$25\% = 35 \text{Rs}$

$$120 \rightarrow 2880 \text{ Rs}$$

$$85 \rightarrow ? = \frac{85 \times 24}{120} = 2040$$

151

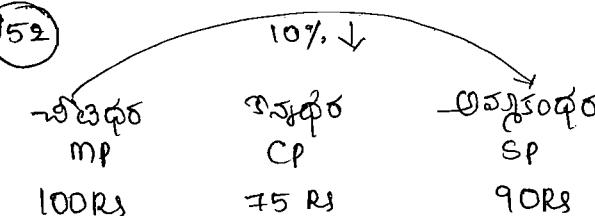


$$120\% \times x = 24 \text{ Rs}$$

$$\frac{6}{5} \times x = 24$$

$$x = 20 \text{ Rs.}$$

152



$$120\% \text{ CP} = 90 \text{ Rs}$$

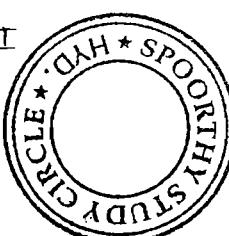
$$\frac{6}{5} \times CP = 90$$

$$CP = 75 \text{ Rs}$$

$$\begin{array}{ccc} MP & CP & SP \\ 100 \text{ Rs} & 75 \text{ Rs} & 90 \text{ Rs} \\ \downarrow 20\% & \downarrow 20\% & \downarrow 20\% \\ 100 \text{ Rs} & 75 \text{ Rs} & 90 \text{ Rs} \end{array}$$

$$\text{Profit \%} = \frac{5}{75} \times 100$$

$$= \frac{20}{3} = 6 \frac{2}{3}\%$$



153

$$SP = 92\% \text{ MP} \quad | \quad SP = 119.6\% \text{ CP}$$

$$92\% \text{ MP} = 119.6\% \text{ CP}$$

$$\frac{92}{100} \text{ MP} = \frac{119.6}{100} \text{ CP}$$

$$\frac{MP}{CP} = \frac{13}{10}$$

கீழெண்டு காரணமாக MP = SP

$$\frac{SP}{CP} = \frac{13}{10} \quad (\text{கிடைவில்லை})$$

$$\text{Profit \%} = \frac{3}{10} \times 100 \Rightarrow 30\% \uparrow$$

154

$$SP = 90\% \text{ MP} \quad | \quad SP = 150\% \text{ CP}$$

$$\frac{90}{100} \text{ MP} = \frac{150}{100} \text{ CP}$$

$$\frac{MP}{CP} = \frac{5}{3} \quad (2 \text{ பகுதி})$$

கீழெண்டு நிதி ஒத்துவாட்டி MP = SP

$$\frac{SP}{CP} = \frac{5}{3} \quad (2 \text{ பகுதி})$$

$$\text{Profit \%} = \frac{2}{3} \times 100 \Rightarrow 66.66 \text{ or } 66 \frac{2}{3}\%$$

155

$$SP = 95\% \text{ MP}$$

$$\frac{14}{266} = \frac{95}{100} \times MP$$

$$MP = 280$$

$$MP = SP_1 = 280$$

$$SP_1 = 112\% \text{ CP}$$

$$\frac{205}{280} = \frac{112}{100} \times CP$$

$$CP = 250$$

156

$$SP = 115\% \text{ CP}$$

$$SP = 115\% \text{ of } 320$$

$$SP = 368$$

$$\begin{array}{r} 100\% - 320 \\ 10\% - 32 \\ \hline 5 - 16 \\ \hline 368 \end{array}$$

$$MP - 32 = SP$$

$$MP - 32 = 368$$

$$MP = 400 \text{ Rs}$$

$$CP = 320 \text{ Rs}$$

$$SP = MP = 400$$

$$80 \text{ Rs.}$$

$$\text{Profit \%} = \frac{80}{320} \times 100 \Rightarrow 25\%.$$

157

$$SP = 95\% \text{ MP} \quad | \quad SP = 123.5\% \text{ CP}$$

$$95\% \text{ MP} = 123.5\% \text{ CP}$$

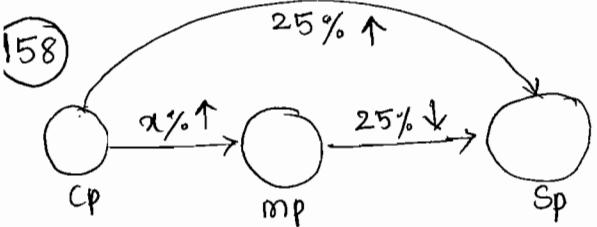
$$\frac{95}{100} \text{ MP} = \frac{247}{100} \times CP$$

$$\frac{MP}{CP} = \frac{13}{10}$$

கீழெண்டு ஒத்துவாட்டி MP = SP

$$\frac{SP}{CP} = \frac{13}{10} \quad (3 \text{ பகுதி})$$

$$\text{Profit \%} = \frac{3}{10} \times 100 \Rightarrow 30\%.$$



$$a = x\% \uparrow, b = 25\% \downarrow \quad \text{Overall} = 25\% \uparrow$$

$$\text{Overall} = a+b + \frac{ab}{100} = 25$$

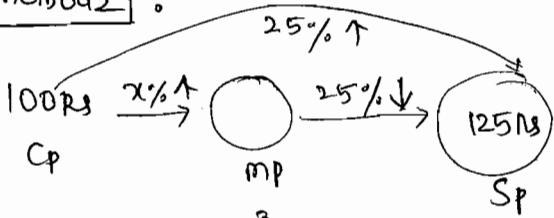
$$x - 25 + \frac{x \times -25}{100} = 25$$

$$x - \frac{x}{4} = 50$$

$$\frac{3x}{4} = 50$$

$$x = \frac{200}{3} = 66.\overline{6} \% \quad \text{or} \quad 66\frac{2}{3}\%$$

Method 2 :



$$100Rs \xrightarrow{x\% \uparrow} \text{MP} \xrightarrow{25\% \downarrow} 125Rs$$

$$100 \times \frac{100+x}{100} \times \frac{75}{100} = 125$$

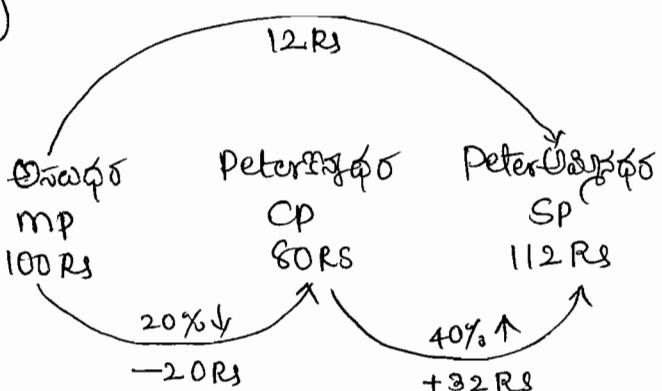
$$(100+x) \times 3 = 500$$

$$100+x = \frac{500}{3}$$

$$x = \frac{200}{3} = 66\frac{2}{3}\%$$



59

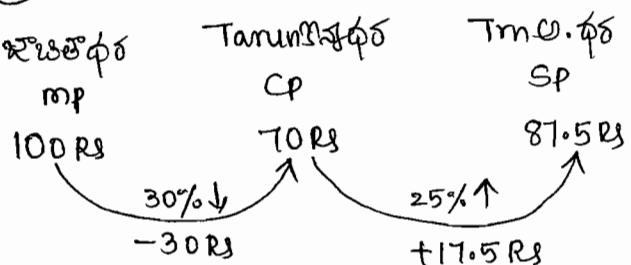


= 12% of 100% එහි පාඨමාලා?

$$= \frac{12}{100} \times 100$$

$$= 12\%.$$

160



$$87.5 \xrightarrow{x100} 8750$$

$$100\% \xrightarrow{x100} ? \quad 10,000$$



వడ్డిరీటు 12.5% అనేది పిసెలు 100 రూల్చి ఎంతాడో?

$$= \frac{12.5}{100} \times 100 \Rightarrow 12.5\%$$

Q7) కొత్తసామాను 5 సాయాల్ తరువాత ఉచ్చే, లేది సామాను తరువాత అవకాశి వట్టినమందు ఎంత?

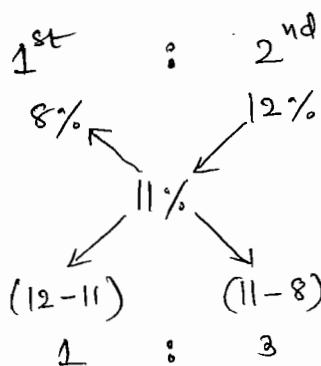
$$A = P + I \quad | \quad A = P + I$$

$$3P = P + 2P \quad | \quad 2P = P + 6P$$

$$2P \rightarrow 5\text{ సాయాల్}$$

$$6P \rightarrow ? = \frac{6 \times 5}{2} = 15\text{ సాయాల్}$$

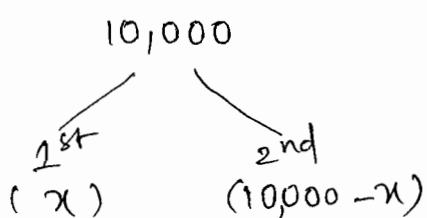
Q8) ఒకవ్యక్తి తనద్వారానే 10 వేల రూపాయలను ఇంధనస్థకీతులలు 8%, 12% వడ్డిరీటుల అను ఇచ్చాడు. లక్ష్మి పెత్తంపీడు 11% వడ్డి ఉపాయంది. ప్రయత్నించాడు ల్యాంకీతునికి 8% ఇచ్చాడనిమిత్తం విభజించాడు.



$$1^{\text{st}} = \frac{1}{4} \times 10,000 = 2500$$

$$2^{\text{nd}} = \frac{3}{4} \times 10,000 = 7500$$

(OR)



$$8\%x + 12\% (10,000 - x) = 11\% 10,000$$

R.S. Aggarwal Book

$$\textcircled{1} \quad SI = \frac{P \times T \times R}{100} = \frac{4800 \times \frac{9}{4} \times \frac{17}{2}}{100} \\ = 153 \times 6 \\ = 918$$

$$\textcircled{2} \quad SI = \frac{P \times T \times R}{100} = \frac{16800 \times \frac{3}{4} \times \frac{25}{4}}{100} \\ = \frac{21}{42} \times 3 \times \frac{25}{4} \\ = \frac{1575}{2} \Rightarrow 787.5$$

(OR)

$$SI = t \ r \% \ p \\ = \frac{3}{4} \times \frac{6 \frac{1}{4}}{4} \% \cdot 16800 \\ = \frac{3}{4} \times \frac{1}{16} \times \frac{25}{4} \cdot 16800 \\ = \frac{1575}{2} = 787.5.$$

\textcircled{3}

9<sup>th</sup> march 2009 — 21<sup>st</sup> may 2009

$$\text{March} = 31 - 9 = 22$$

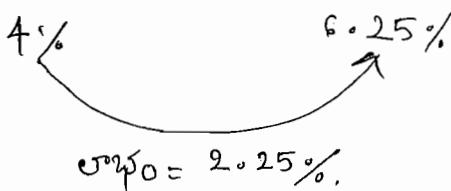
$$\text{April} = 30$$

$$\text{May} = \frac{21}{73 \text{ day}}$$

$$= \frac{21}{365} = \frac{1}{5} \text{ సాయాల్}$$

$$SI = \frac{P \times T \times R}{100} = \frac{1820 \times \frac{1}{5} \times \frac{3}{2}}{100} \\ = 27.3$$

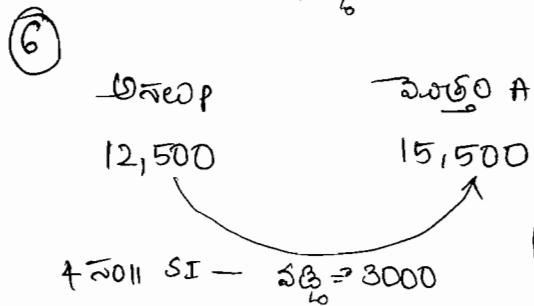
\textcircled{4}



$$\begin{aligned} \text{③ } \text{மாது} &= 2125\% \text{ of } 5000 \\ &= \frac{225}{100} \times 5000 \\ &= 11250 \end{aligned}$$

$$\begin{aligned} \text{⑤ } 1 \text{ நூலின் வடிகூடு} &= 45\% \text{ of } 450 \\ &= 20.25 \end{aligned}$$

$$\text{விருப்பநூல்} = \frac{\text{விருப்பங்கூடு}}{1 \text{ நூலின் வடிகூடு}} = \frac{81^4}{20.25} = 4 \text{ நூல்}$$



$$1 \text{ நூல் SI} = \frac{3000}{4} = 750$$

வடிகூடு ர = வடிகூடு 750 மாத மாத 12,500 மாத

$$\text{வடிகூடு?} \Rightarrow \frac{750}{12,500} \times 100 \Rightarrow 6\%.$$

$$\text{⑦ } 2 \text{ நூல் மாத} = 2 \frac{41}{123} = 2 \frac{1}{3} = \frac{7}{3} \text{ நூல்}$$

$$\frac{7}{3} \text{ நூல்} \rightarrow 252$$

$$1 \text{ நூல்} \rightarrow ? = \frac{1 \text{ நூல்} \times 252 \times 3}{7} = 108$$

வடிகூடு ர = 108 மாத மாத 1690 மாத வடிகூடு

$$= \frac{108}{1690} \times 100 \Rightarrow 6 \frac{3}{4}\%$$

$$\text{⑧ } P = 1200$$

$$\frac{t}{500} = \frac{r}{\text{வடிகூடு}}$$

$$SI = 432 \rightarrow r = ?$$

$$SI = \frac{P \times r \times t}{100}$$

$$432 = \frac{1200 \times r \times t}{100}$$

$$r^2 = 36$$

$$r = 6$$

$$\text{⑨ } r = 12\%, t = 3 \text{ நூல்}, SI = 5400$$

$$SI = 36\%$$

$$36\% P = 5400$$

$$\frac{36}{100} \times P = \frac{5400}{150}$$

$$P = 15000$$

(OR)

$$36\% \rightarrow 5400$$

$$100\% \rightarrow ?$$

$$= \frac{100 \times 5400}{36}$$

$$= 15000$$

$$\text{⑩ } r = 5\%, t = 2 \text{ yrs}, A = 132, P = ?$$

$$A = P + I$$

$$= 100\% + 10\%$$

$$= 110\%$$

$$110\% \cdot P = 132$$

$$\frac{110}{100} \times P = \frac{132}{100}$$

$$P = 120$$

(OR)

$$110\% \rightarrow 132$$

$$100 \rightarrow ?$$

$$= \frac{100 \times 132}{110}$$

⑪

$$r = 9\%, t = 5 \text{ நூல்}, SI = 401625, P = ?$$

$$SI = 45\%$$

$$45\% P = 401625$$

$$\frac{45}{100} \times P = \frac{4016.25}{100} \Rightarrow P = \frac{401625}{45}$$

$$P = 8925$$

$$\text{⑫ } t = x, r = x\%, SI = x, P = ?$$

$$SI = \frac{P \times t \times r}{100}$$

$$x = \frac{P \times x \times x}{100}$$

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

3)

Case 1

$$\text{3 years} \Rightarrow SI = 156$$

$$\text{1 year} = \frac{156}{3} = 52$$

வடிவமீன் = 52 அந்த 800 மீல் எங்களுக்கு?

$$= \frac{\frac{13}{2}}{800} \times 100 = \frac{13}{2} \Rightarrow r = 6.5\%$$

Case 2

$$P = 800, t = 3 \text{ yrs}, r = 6.5 + 4 = 10.5\%.$$

$$\begin{aligned} A &= P + I \\ &= 800 + 31.5\% \end{aligned}$$

$$A = 131.5\% \cancel{800}$$

$$A = 131.5\% \cancel{800} \\ = 1052.0.$$

$$14) \quad \text{1 year } SI = 1750$$

$$\text{1 year} = \frac{1750}{100} = 250$$

வடிவமீன் = 250 அந்த ~~(அது)~~ மீல் எங்களுக்கு?  
ஏது.

கேள்வியின் மூல பிரிவை கணக்காக கொண்டு வரவில்லை. Cannot determine.

15)

$$SI_1 = SI_2$$

$$\frac{P_1 t_1 r_1}{100} = \frac{P_2 t_2 r_2}{100}$$

$$\frac{50}{800} \times \frac{1}{2} \times \frac{9}{2} = \frac{150}{150} \times t_2 \times 8$$

$$t_2 = 9 \text{ yrs.}$$

16)

Case 4

$$\begin{aligned} P &= 64 & A &= 83.2 \\ \text{1 year} & & \text{3 முத்து} & \\ \text{SI} & & & \\ \text{SI} &= 19.8 & & \\ t &= 2 \text{ yrs.} & & \end{aligned}$$

$$\begin{aligned} P &= 86, & t &= 4 \text{ yrs} \\ \text{SI} &=? & A &=? \\ A &= P + I & & \end{aligned}$$

Case 2

$$SI = \frac{P t r}{100} \rightarrow r = ? \text{ %}$$

$$SI \propto P t$$

$$\frac{SI_1}{SI_2} = \frac{P_1 t_1}{P_2 t_2}$$

$$\frac{1.2}{19.2} = \frac{32 \times 2}{64 \times 4}$$

$$SI_2 = 43 \times 1.2$$

$$= 51.6$$

$$\begin{aligned} A &= P + I \\ &= 86 + 51.6 \\ &= 137.6 \end{aligned}$$

$$17) \quad \text{இவ்வினாவிற்கு } P_1 = P_2$$

$$\begin{aligned} SI_1 &= SI_2 \\ \frac{P_1 t_1 r_1}{100} &= \frac{P_2 t_2 r_2}{100} \\ 8 \times 5 &= 15 \times r_2 \\ r_2 &= 8\% \end{aligned}$$

$$18) \quad \begin{array}{c} \text{அந்த}=0.5\% \\ \swarrow \quad \searrow \\ 4.5\% \qquad \qquad \qquad 5\% \end{array}$$

$$\text{வடிவமீன்} = 202.50$$

$$\begin{aligned} 4.5 &\rightarrow 202.50 & 45 \\ 0.5 &\rightarrow ? = \frac{0.5 \times 202.50}{4.5} \\ &= 22.50 \end{aligned}$$

19)

$$\text{முத்து} = 504$$

$$\begin{aligned} r &= 5\% \\ t &= 4 \text{ yrs.} \end{aligned}$$

$$\begin{aligned} A &= P + I \\ &= 100\% + 20\% \end{aligned}$$

$$A = 120\%$$

$$\begin{aligned} \text{முத்து} &=? \\ r &= 10\% \\ t &= 2 \frac{1}{2} \text{ yrs.} \\ A &= P + I \\ &= 100\% + 25\% \\ A &= 125\% \end{aligned}$$

$$\begin{aligned} 120\% &\rightarrow 504 \\ 125\% &\rightarrow ? = \frac{25}{125} \times \frac{504}{100} = 525. \end{aligned}$$

(21)

11 సెప్టెంబర్

3 సెప్టెంబర్	5 సెప్టెంబర్	3 సెప్టెంబర్
6% p.a	9% p.a	13% p.a
మొత్తం వర్షా = 18%.	45%	39%

$$\text{మొత్తం వర్షా} = 18 + 45 + 39 = 102$$

$$\text{మొత్తం వర్షా} 102\% \rightarrow 8160$$

$$\text{అనుభం} - 100\% \rightarrow ?$$

$$= \frac{100 \times 8160}{102} = 8000$$

(22)

Case 1

$$P = P, r = r, t = 10 \text{ yrs}, SI = 600$$

$$SI = \frac{P \times r}{100}$$

$$600 = \frac{P \times 10 \times r}{100}$$

$$r = \frac{6000}{P}$$

Case 2

$$t = 5$$

$$P = P$$

$$r = r$$

$$SI_1 = \frac{P \times r}{100}$$

$$= P \times 5 \times \frac{6000}{P}$$

$$= 300$$

$$t = 5$$

$$P = 3P$$

$$r = r$$

$$SI_2 = \frac{P \times r}{100}$$

$$SI_2 = 3P \times 5 \times \frac{6000}{P}$$

$$SI = 900$$

$$SI = SI_1 + SI_2$$

$$= 300 + 900$$

$$= 1200$$

(23)

అనుభం — వర్షా

$$\text{సెలవు} 1 \text{ రూపాయి} = 3 \text{ paise}$$

$$\text{సెలవు} 10 \text{ రూపాయిలో} = 30 \text{ paise}$$

$$4 \text{ సెలవులో} 10 \text{ రూపాయిలో} = 120 \text{ paise}$$

$$1.2 \text{ RS}$$

(24)

చాలావడి

$$r = 10\% \text{ p.a}$$

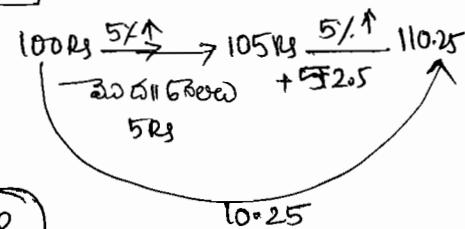
$$100Rs \xrightarrow[10Rs]{10\% \uparrow} 110Rs$$

నువ్వువడి

తుండీ ఉన్నటలో ప్రస్తుతి వర్షా  
కావుతున్నాడు.

$$r = 10\% \text{ p.a.}$$

6 సెలవులో  $r = 5\% \text{ half yearly}$



OR

$$a = 5\%, b = 5\%$$

$$+ 5\% \uparrow \quad + 5\% \uparrow$$

$$\text{Overall} = a + b + \frac{ab}{100}$$

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

$$= 10 + \frac{25}{100}$$

$$= 10.25.$$

(25)

$$\text{మొత్తం} = \text{అనుభం} + \text{వర్షా}$$

$$A = P + I$$

$$A_4 = P + 4I = 854$$

$$A_3 = P + 3I = 815$$

$$I = 39$$

$$P + 3I = 815$$

$$P + 3 \times 39 = 815$$

$$P + 117 = 815$$

$$P = 815 - 117 \Rightarrow$$

$$= 698.$$

26

$$\text{ప్రెత్త} = \text{అను} + \text{వడ్డి}$$

$$P + 7I = 1020$$

$$P + 2I = 720$$

$$\begin{array}{r} - \\ - \\ \hline 5I = 300 \end{array}$$

$$I = 60$$

$$\rightarrow P + 2I = 720$$

$$P + 2(60) = 720$$

$$P + 120 = 720$$

$$\begin{aligned} P &= 720 - 120 \\ &= 600 \end{aligned}$$

27

$$P + 8I = 12005$$

$$P + 5I = 9800$$

$$\begin{array}{r} - \\ - \\ \hline 3I = 2205 \end{array}$$

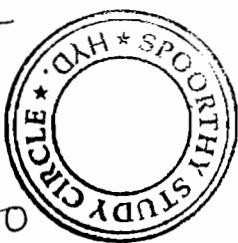
$$I = 735$$

$$\rightarrow P + 5(735) = 9800$$

$$P + 3675 = 9800$$

$$P = 9800 - 3675$$

$$P = 6125$$



వడ్డిరేటు = వడ్డి 735 అనుబంధ 6125లోపుకొనట?

$$r = \frac{\text{వడ్డి}}{\text{అనుబంధ}} \times 100$$

$$= \frac{735}{6125} \times 100$$

$$\frac{245}{49}$$

$$= 12\%$$

28

$$P + 4I = 1064.2$$

$$P + 2.5I = 1012$$

$$\begin{array}{r} - \\ - \\ \hline 1.5I = 55.2 \end{array}$$

$$I = \frac{18.4}{15.5} = \frac{18.4}{5} = 36.8$$

$$P + 2.5I = 1012$$

$$P + 2.5(36.8) = 1012$$

$$P + 92.00 = 1012$$

$$\curvearrowleft$$

$$P = 920$$

వడ్డిరేటు = వడ్డి 36.8 అనుబంధ 920లోపుకొనట?

$$r = \frac{\text{అనుబంధ}}{\text{అనుబంధ}} \times 100$$

$$= \frac{36.8}{920} \times 100$$

$$= 4\%.$$

29

$$\text{ప్రెత్త} = \text{అను} + \text{వడ్డి}$$

$$200\text{Rs} = 100\text{Rs} + 100\text{Rs}$$

$$r = 12\%$$

$$1\text{నుం} \text{SI} = 12\% \text{ of } 100\text{Rs}$$

$$1\text{నుం} \text{SI} = 12\text{Rs}$$

$$\text{వర్షాను} = \frac{\text{ప్రెత్త వడ్డి}}{1\text{నుం} \text{వడ్డి}}$$

$$= \frac{100}{12}$$

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

$$= 8\text{సు} 14\text{ సెంచెయి}$$

30

$$\text{ప్రెత్త} = \text{అను} + \text{వడ్డి}$$

$$200\text{Rs} = 100\text{Rs} + 100\text{Rs}$$

$$12\text{సు} \text{ వడ్డి SI} = 100\text{Rs}$$

$$1\text{సు} \text{ వడ్డి SI} = \frac{100}{12} \text{Rs} = 8\frac{1}{3} \text{Rs.}$$

వడ్డిరేటు = వడ్డి  $8\frac{1}{3}$  అనుబంధ 100లోపుకొనట?

$$= \frac{8\frac{1}{3}}{100} \times 100 = 8\frac{1}{3}\%.$$

31

$$\text{ప్రెత్త} = \text{అను} + \text{వడ్డి}$$

$$400 = 100\text{Rs} + 300\text{Rs}$$

$$15\text{సు} \text{ SI} = 300\text{Rs} \quad (\frac{300}{15})$$

$$1\text{సు} \text{ SI} = 20\text{Rs}$$

$$r = \frac{20}{100} \times 100 \Rightarrow 20\%.$$

$$32 \quad 2P = P + P \quad | \quad 4P = P + 3P$$

$$\begin{array}{l} P \rightarrow 6\text{సు} \\ 3P \rightarrow ? \end{array} = \frac{3P \times 6}{P} = 18\text{సు}$$

$$(33) \text{ वैध} = \text{प्र} + \text{व}$$

$$3P = P + 2P$$

$$\text{वैध} = P + V$$

$$2P = P + P$$

$$2P \rightarrow 15\text{लाख} \text{ (ठिकाण)}$$

$$P \rightarrow ? = P 7\frac{1}{2}\text{लाख} + 3\text{लाख}$$

$$= 1\text{लाख } 10\text{लाख}$$

(34)

~~$$r = 16\frac{2}{3}\%, t = 54r, \text{ देखिए पर्याप्त जानकारी नहीं है।}$$~~

~~$$r = 20\%, t = 5\text{yr}, \dots$$~~

~~$$5\text{yr देखिए, } 10\text{लाख } 40\text{लाख पर्याप्त जानकारी नहीं है।}$$~~

$$2P = P + P$$

$$P \rightarrow 5\text{yr}$$

$$3P \rightarrow ? = \frac{3P \times 5}{P} = 15\text{yr}$$

(35)

$$P = P$$

$$r = 8\%$$

$$t = 6\text{yrs}$$

$$SI = \frac{P}{2}$$

$$SI = \frac{P + r}{100}$$

$$\cancel{\frac{P}{2}} = \frac{P \times 6 \times 8}{100}$$

So, Data Inadequate



(36)

$$SI = \frac{2}{5}P$$

$$P = P$$

$$r = ?$$

$$t = 10$$

$$SI = \frac{P + r}{100}$$

$$\frac{2}{5}P = \frac{P \times 10 \times r}{100}$$

$$r = 4\%$$

(37)

$$SI = 0.125P$$

$$= \frac{125}{1000} \times P$$

$$P = P$$

$$r = 10\%$$

$$t = ?$$

$$SI = \frac{P + r}{100}$$

$$\frac{5}{25}P = \frac{P \times t \times \frac{2}{4}}{100}$$

$$t = \frac{5}{4}$$

$$t = 1 \frac{1}{4} \text{ years.}$$

(38)  $SI = 40\% P = \frac{2}{5}P$

$$P = P, r = 5\%, t = ?$$

$$SI = \frac{P + r}{100}$$

$$\frac{2P}{5} = \frac{P \times t \times 5}{100}$$

$$t = 8 \text{ yrs.}$$

(39)

$$\text{वैधता} = \text{प्र} + \text{व}$$

$$A = \frac{7}{B} \times P$$

$$A = P + \frac{P}{6}$$

$$SI = \frac{P + r}{100}$$

$$\frac{P}{6} = \frac{P \times 3 \times r}{100}$$

(40)

$$SI = \frac{1}{9} \times P$$

$$P = P, r = r, t = t, f = r$$

(वैधता, प्र, वर्ष, लम्बाई)

$$SI = \frac{P + r}{100}$$

$$\frac{P}{9} = \frac{P \times r \times r}{100} \Rightarrow r^2 = \frac{100}{9} \Rightarrow r = \sqrt{\frac{100}{9}} = 3\frac{1}{3}\%$$

(41)

$$SI = \frac{9}{16}P$$

$$\text{वैधता} = 500$$

$$r = t$$

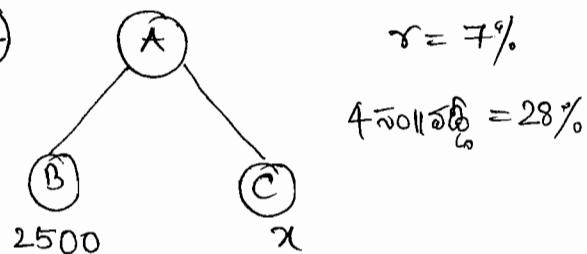
$$SI = \frac{P + r}{100}$$

$$\frac{9}{16}P = \frac{P + t}{100}$$

$$t^2 = \frac{900}{16}$$

$$= 7\frac{1}{2} \text{ years.}$$

42



$$\tau = 7\%$$

$$4\text{ సార్లకి} = 28\%$$

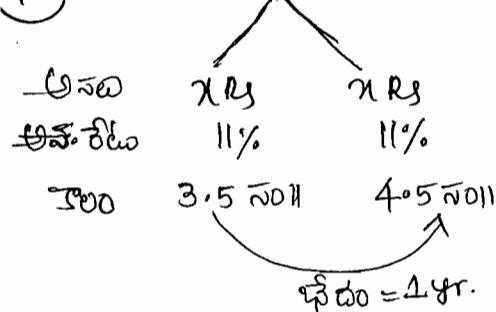
$$\begin{aligned} \text{మొత్తం వర్తీ} &= 28\% (2500 + x) = 1120 \\ &= \frac{28}{100} (2500 + x) = 1120 \end{aligned}$$

$$2500 + x = 4000$$

$$x = 4000 - 2500$$

$$x = 1500$$

43



$$\text{వర్తీలో ధైర్య} = 11\% x = 41.25$$

$$\frac{11}{100} x = \frac{41.25}{100}$$

$$x = 3750$$

44

$$\text{గిసయ} = x \text{ అనుభావమ.}$$

$$\begin{aligned} \frac{x \times \frac{15}{12} \times \frac{15}{12}}{100} - \frac{x \times \frac{8}{12} \times \frac{25}{2}}{100} &= 32.5 \\ \frac{225x - 200x}{24} &= 3250 \end{aligned}$$

$$\frac{25x}{24} = 3250$$

$$x = 3120$$

45

$$\begin{aligned} \frac{A}{4} &= \frac{B}{5} \quad (\text{అప్పుడు}) \\ \frac{A}{B} &= \frac{4}{5} \\ A : B &= 4 : 5 \\ 4x &= 5x \end{aligned}$$

మొత్తం వర్తీ

$$12\% 4x + 14\% 5x = 354$$

$$48/x + 70/x = 354$$

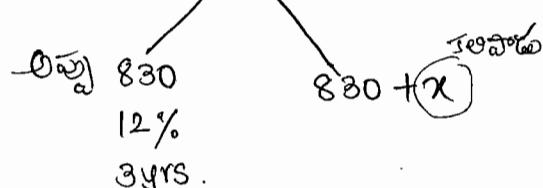
$$118\% x = 354$$

$$\frac{118}{100} x = \frac{354}{100}$$

$$x = 300$$

$$\begin{aligned} \text{మొత్తం పెట్టుబడి} &= 4x + 5x = 9x \\ &= 9 \times 300 \\ &= 2700 \end{aligned}$$

46



$$42\% (830 + x) - 36\% 830 = 93.90$$

$$(42\% 830 + 42\% x) - (36\% 830) = 93.90$$

$$\frac{6}{100} 830 + 42\% x = 93.9$$

$$6 \times 830 + 42x = 9390$$

$$4980 + 42x = 9390$$

$$42x = 9390 - 4980$$

$$42x = 4410$$

$$x = \frac{4410}{42}$$

$$x = 105$$

(47)

$$500 \quad 600$$

P అసలు

r వర్షిం 3% 4.5%

t రో 1 సాలు 1 సాలు

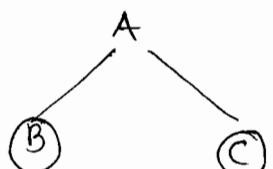
$$\text{మొత్తం వడ్డి} = 3\% \times 500 + 4.5\% \times 600 = 126$$

$$15x + 27x = 126$$

$$42x = 126$$

$$x = 3$$

(48)



P అసలు - 5000

r వర్షి. r%

t రో 2 సాలు

8000

r%

4 సాలు

$$\text{మొత్తం వడ్డి} = 2r\% \times 5000 + 4r\% \times 3000 = 2200$$

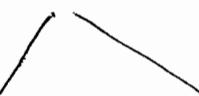
$$100r + 120r = 2200$$

$$220r = 2200$$

$$r = 10\%$$



(49)



అసలు = 725

వర్షి = r% / సాలు

రో = 1 సాలు

అసలు = 362.5

వర్షి = 2r% / సాలు

రో = 4 సాలు ( $\frac{1}{12} = \frac{1}{3}$  సాలు)

$$r\% \times 725 + \frac{1}{3} \times 2r\% \times 362.5 = 33.5$$

$$725r + \frac{2}{3} \times 362.5r = 33.5$$

$$725 \left( r + \frac{2}{3}r \right) = 33.5$$

$$725 \left( \frac{5}{3}r \right) = 33.5$$

$$r = \frac{67 \times 3}{29 \times 2} = r = \frac{201}{58}$$

$$r = 3.4 / 3.6$$

(50) 3 సాలు వడ్డి (SI) లోకిదా = 13.5  
1 సాలు " " " =  $\frac{13.5}{3} = 4.5$

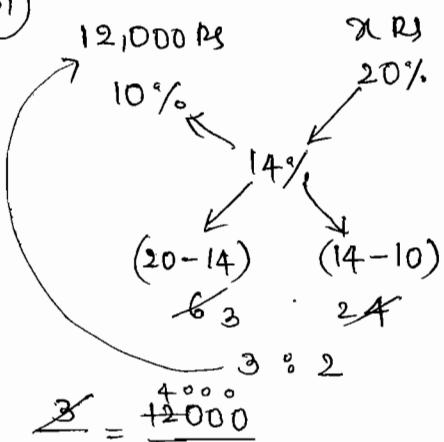
1 సాలు వడ్డిలోకిదా 4.5 అనేది అసలు 1500 అన్నాడు

$$\text{వర్షిం} = \frac{\text{అసలు}}{\text{ఎందుకొస్తా}} \times 100$$

$$= \frac{4.5}{1500} \times 100$$

$$\text{వర్షిం} = 0.3\%$$

(51)



$$x = 8000$$

$$\text{మొత్తం పట్టుబడ్డి} = 12000 + 8000 = 20,000$$

(OR) weighted Avg Method

$$\text{సమానం వడ్డిం} = \frac{n_1 x_1 + n_2 x_2}{n_1 + n_2}$$

$$14 = \frac{12000 \times 10 + x \times 20}{12000 + x}$$

$$14 \times 12000 + 14x = 10 \times 12000 + 20x$$

$$6x = 4x \frac{20}{12000}$$

$$x = 8000$$

$$\text{మొత్తం} = 12000 + 8000 = 20,000$$

(52) P = 2600, r =  $6 \frac{2}{3}\%$  or  $6 \frac{20}{3}\%$   
t = ?

$$SI = \frac{P+r}{100} = \frac{2600 \times \frac{20}{3} \times t}{100}$$

$$SI = 26 \times \frac{20}{3} \times t \quad (\text{అధ్యాత్మ నిధీ})$$

దశలు, హిస్టోరీ

So, t = 3 తేదీ 3 తోషి నుండి.

(53) A      B

$$P_1 \quad P_2$$

$$t_1 = \frac{1}{2} \text{ yr} \quad t_2 = \frac{1}{2} \text{ yr}$$

$$r_1 = 5 \quad r_2 = 4$$

$$r_1 : r_2 = 5 : 4$$

$$SI_1 = SI_2$$

$$\frac{P_1 \times r_1}{100} = \frac{P_2 \times r_2}{100}$$

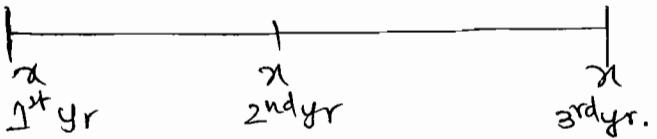
$$\frac{P_1}{P_2} = \frac{r_2}{r_1} = \frac{4}{5}$$

↳ ఇటువంచ్చిగాడి

### Installments in Simple Interest

Amount

(Q1) 1980 రూ. || ల లోన్ షెట్తు బాపును 10% వర్షాదీంతం 3 సా. ల లో చెల్లాన్ని 2 గంగులలు దింత ?



అతివాయిదా = x అనుమతి (వర్షాదీంతం)

$$3x + 10\% \cdot 2x + 10\% \cdot x = 1980$$

$$x \left( 3 + \frac{1}{10} \times 2 + \frac{1}{10} \right) = 1980$$

$$x \left( \frac{30+2+1}{10} \right) = 1980$$

$$x \left( \frac{33}{10} \right) = 1980$$

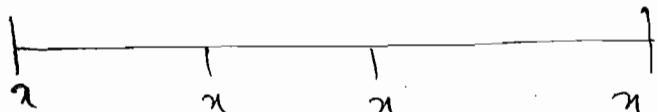
$$x = 600$$

Explanation:

600	600	600
After 1 <sup>st</sup> yr	60	60
After 2 <sup>nd</sup> yr		
1800 180 1980		

(57)

అతివాయిదా అనుమతి (వర్షాదీంతం రూటు)



$$4x + 5\% \cdot 3x + 5\% \cdot 2x + 5\% \cdot x = 6450$$

$$4x + 15\% \cdot x + 10\% \cdot x + 5\% \cdot x = 6450$$

$$4x + 30\% \cdot x = 6450$$

$$4x + \frac{3x}{10} = 6450$$

$$\frac{43x}{10} = 6450$$

$$x = 1500$$

(54) అనుమతి P

$r\%$

2 yrs.      తేడా 2%      (r+2%)      2 yrs.

$$1 \text{ సా. తేడా} = 2\% \quad | \quad 4 \rightarrow 72$$

$$2 \text{ సా. తేడా} = 4\% \quad | \quad 100\% \rightarrow ? = \frac{100 \times \frac{18}{72}}{4} = 1800$$

మంగళ 3% అయితే



$$1 \text{ సా. తేడా} = 3\% \quad | \quad 6\% \xrightarrow{x/12} 72$$

$$2 \text{ సా. తేడా} = 6\% \quad | \quad 100\% \xrightarrow{x/12} = 1200 \text{ Rs.}$$

(55)

$r_1 = 10\%$        $r_2 = 12.5\%$   
తేడా 2.5%

$$2.5\% \rightarrow 1250$$

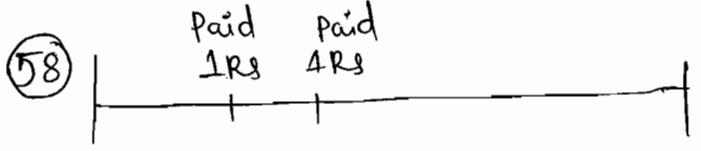
$$100\% \rightarrow ? = \frac{100 \times 12500}{500} = 50000$$

(56)

$r_1 = 8\%$        $r_2 = 7\frac{3}{4}\%$   
తెగ్గులు  $\frac{1}{4}\%$

$$\frac{1}{4} \rightarrow 61.5$$

$$8\% \rightarrow ? = \frac{100 \times 61.5}{\frac{1}{4}} = \frac{6150}{4} = 24600$$



$$\text{Total} = 10\text{Rs} \quad 9\text{Rs} \quad 8\text{Rs} \dots \dots \dots - 1\text{Rs}$$

$$\text{Sum of terms} = 10 + 9 + 8 + \dots + 1$$

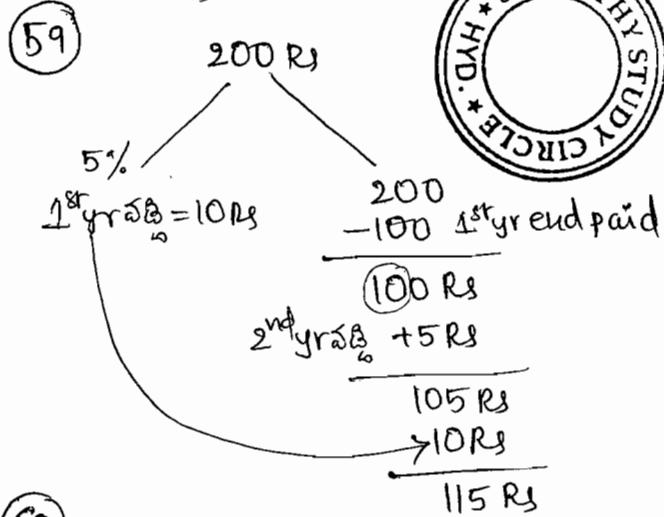
$$= \frac{n(n+1)}{2} = \frac{10(11)}{2} = 55$$

$$P = 55\text{Rs}, t = 1\text{year} = \frac{1}{12} \text{months}, r = ? \text{ SI} = 1\text{Rs}.$$

$$\text{SI} = \frac{ptr}{100}$$

$$1\text{Rs} = \frac{55 \times \frac{1}{12} \times r}{100}$$

$$r = \frac{240}{20} = r = 21\frac{9}{11}\%$$



(60) Given  $P = 20,000$

$$\text{First year's 1st Instalment} = \frac{1000}{19000}$$

$$\text{Sum of terms} = 19000 + 18000 + \dots + 1000$$

$$= 1000(19 + 18 + 17 + \dots + 1)$$

$$= 1000 \left( n \left( \frac{n+1}{2} \right) \right)$$

$$= 1000 \left( \frac{19 \times 20}{2} \right)$$

$$= 190,000$$

$$P = 19,000, r = 6\%, t = 1\text{year} = \frac{1}{12} \text{months}$$

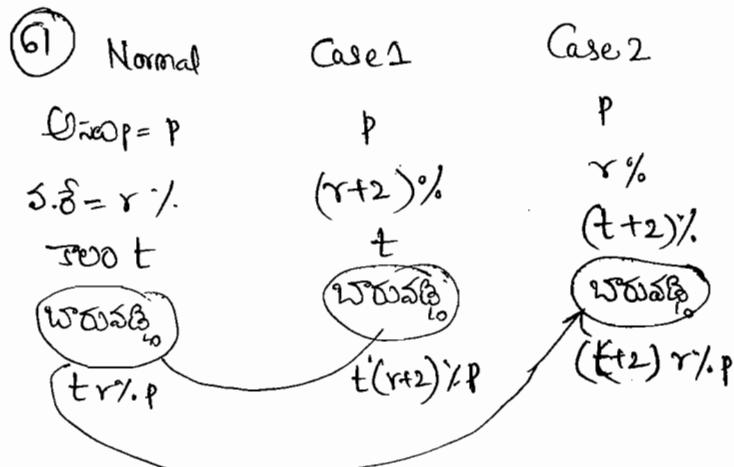
$$\text{SI} = \frac{P \cdot t \cdot r}{100}$$

$$= \frac{19000 \times \frac{1}{12} \times 6}{100}$$

$$SI = \frac{1900}{2}$$

$$SI = 950$$

$$\text{1st Instalment} = 1000 + 950 \rightarrow 1950$$



So, Variables  $P, t, r$  are same in 2 cases - Hence.

Given (3 conditions, 2 variables) data will be.

(62)

$$\begin{array}{ccccc} 13900 & & & & \\ \swarrow & & \searrow & & \\ B & & A & & \\ x\text{Rs} & & (13900-x) & & \\ 11\% & & 14\% & & \\ 2\text{months} & & 2\text{months} & & \end{array}$$

$$22\%x + 28\% (13900-x) = 3508$$

$$22\%x + 28\% 13900 - 28\%x = 3508$$

$$-6x + 3892 = 3508$$

$$6\%x = 384$$

$$\frac{6}{100}x = 384$$

$$x = 6400$$

(63)

$$\begin{array}{ccccc} 2600 & & & & \\ \swarrow & & \searrow & & \\ x & & y & & \\ 10\% & & 9\% & & \\ 5\text{months} & & 6\text{months} & & \end{array}$$

वर्द्धिलाभवार्ष

$$SI_1 = SI_2$$

$$\frac{25}{50}x \cdot x = \frac{27}{54} \cdot xy$$

$$25x = 27xy$$

$$\frac{x}{y} = \frac{27}{25}$$

$$x:y = 27:25$$

$$x = \frac{27}{52} \times 2600$$

$$x = 1350$$

64

$$3 \text{ లో } 11 \text{ SI} = 300 \text{ Rs}$$

$$1 \text{ లో } 11 \text{ SI} = \frac{300}{3} = 100 \text{ Rs}$$

మొత్తం పీడన వర్ణించుట = 100 రూప్యల లో 50 రూప్య కొత్తం

$$= \frac{100}{1550} \times 100\% = \frac{200}{31}\%$$

$$x : y$$

$$5\% : 8\%$$

$$\frac{200}{31}\%$$

$$8 - \frac{200}{31} : \frac{200}{31} - 5$$

$$\frac{248 - 200}{31} : \frac{200 - 155}{31}$$

$$\frac{48}{31} : \frac{45}{31}$$

$$16 : 15$$

10,000

2000	4000	1400	( <u>గిర్జెలు</u> )
8%	7.5%	8.5%	x%

$$\text{మొత్తం పీడన} = 160 \text{ Rs} + 300 \text{ Rs} + 119 \text{ Rs} + 26x = 813$$

$$579 + 26x = 813$$

$$26x = 234$$

$$13x = 117$$

$$13x = 117$$

$$x = 9\%$$

$$1^{\text{st}} \quad \quad \quad 2^{\text{nd}}$$

$$9\% \quad \quad \quad 11\%$$

$$9.75\% \quad \quad \quad 9.75\%$$

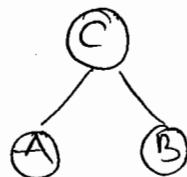
$$+25 : 0.75$$

$$5 : 3$$

$$1^{\text{st}} = \frac{5}{8} \times \frac{12500}{1000000} = 62500$$

$$2^{\text{nd}} = \frac{3}{8} \times \frac{12500}{1000000} = 37500$$

67



$$C : A = \left( \frac{3}{150} : \frac{2}{100} \right) \times 4 \quad | \quad C : B = \frac{12}{240} : \frac{5}{100}$$

$$C : A = 12 : 8$$

$$C : B = 12 : 5$$

$$\text{పాట్టించుడి} = A : B : C = 8 : 5 : 12$$

$A$	$B$	$C$
$8x$	$5x$	$12x$
10%	12%	15%

అనువొమత.

$$\text{మొత్తం పీడన} = 10\% \cdot 8x + 12\% \cdot 5x + 15\% \cdot 12x = 3200$$

$$80\% \cdot x + 60\% \cdot x + 180\% \cdot x = 3200$$

$$320\% \cdot x = 3200$$

$$\frac{320}{100} = \frac{3200}{100}$$

$$x = 1000$$

$$B \text{ పాట్టించుడి} = 5 \times 1000 = 5000$$

68

2600

$x$	$y$	$z$
4%	6%	8%

$$SI_1 = SI_2 = SI_3$$

$$\frac{4}{2}x = \frac{6}{3}y = \frac{8}{4}z$$

$$\frac{2x}{12} = \frac{34}{12} = \frac{4z}{12}$$

$$\frac{x}{6} = \frac{4}{4} = \frac{z}{3}$$

$$x : y : z = 6 : 4 : 3$$

$$x = \frac{6}{13} \times \frac{2600}{100} = 1200$$

3సార్ల  
2, 3, 4  
= (12)

69

(69)

2379

$x$	$y$	$z$
5%	5%	5%
2 లోలీ	3 లోలీ	4 లోలీ
వర్షా - 10%	15%	20%
అసెం - 100%	100%	100%
మొత్తం - 110%	115%	120%

మొత్తం సమానం

$$A_1 = A_2 = A_3$$

$$110\% \cdot x = 115\% \cdot y = 120\% \cdot z$$

$$22x = 23y = 24z$$

$$\frac{22x}{22 \times 23 \times 24} = \frac{23y}{22 \times 23 \times 24} = \frac{24z}{22 \times 23 \times 24}$$

$$\frac{x}{552} = \frac{4}{528} = \frac{2}{506}$$

(సాధ్య)

$$x:y:z = 552 : 528 : 506$$

$$= 276 : 264 : 253$$

$$x = \frac{276}{793} \times 2379$$

$$x = 828$$



(70)

మొత్తం విలువు =  $12x$ 

$\frac{1}{3}$ ఫ్రో	$\frac{1}{4}$ ఫ్రో	విలువు
$4x$	$3x$	$5x$
7%	8%	10%
$28\% x + 24\% x + 50\% x = 561$		

$$102\% x = 561$$

$$\frac{102}{100} \times x = \frac{561}{50}$$

$$x = 550$$

$$\begin{aligned} \text{విలువు} &= 12x \\ &= 12 \times 550 \\ &= 6600 \end{aligned}$$

# Compound Interest

\* విధ్వని ఎక్కువాలు తెలుసున్నటి చూస్తోమా.

Q1) ప్రసాద  $P = 3000$ ,  $r = 10\% \text{ p.a.}$  (చుక్కలాభాన్తరిణి)  
 $t = 3 \text{ yrs}$ , మొత్తం  $A = ?$ , చుక్క చీ.ఐ. = ?

$$\text{మొత్తం } A = P \left(1 + \frac{r}{100}\right)^n \quad [\text{చ.వ. సంఖ్యాతీఱిణి}]$$

$$\text{మొత్తం } A = P \left(1 + \frac{r}{200}\right)^{2n} \quad [\text{చ.వ. అభిసంఖ్యాతీఱిణి}]$$

$$\text{మొత్తం } A = P \left(1 + \frac{r}{400}\right)^{4n} \quad [\text{చ.వ. త్రిపుస్తకం}]$$

$P = \text{ప్రసాద}, r = \text{rate of interest}, n = \text{ఎత్తసంఖ్య}$

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

$$\begin{aligned} A &= 3000 \left(1 + \frac{10}{100}\right)^3 \\ &= 3000 \left(\frac{11}{10}\right)^3 \\ &= 3000 \left(\frac{1331}{1000}\right) \end{aligned}$$

$$A_3 = 3993$$

$$\text{C.I.} = A - P \Rightarrow 3993 - 3000$$

$$\text{C.I.} = 993.$$

Method 2

Q2)  $P = 3000$ ,  $r = 10\% \text{ p.a.}$ ,  $t = 3 \text{ yrs.}$   
 $\downarrow$   
 (చ.వ. సంఖ్యాతీఱిణి)

i) ప్రథమంగా మొత్తం  $A_1 = 110\% \text{ of } 3000 = 3300$

ii) " " " చుక్క చీ.ఐ. ( $C.I_1$ ) =  $10\% \text{ of } 3000 = 300$

iii) రెండవ " " మొత్తం  $A_2 = 121\% \text{ of } 3000 = 3630$

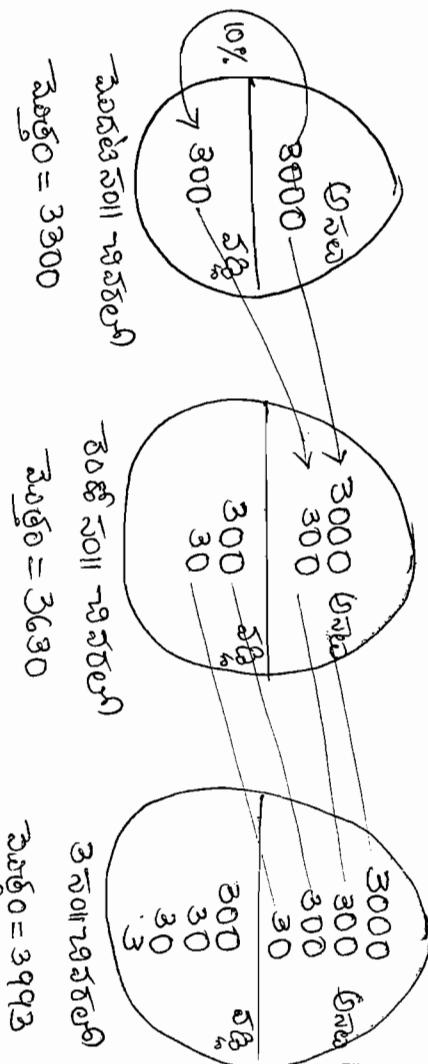
iv) " " " చుక్క ( $C.I_1 + C.I_2$ ) =  $21\% \text{ of } 3000 = 630$

v) మహాండు " " మొత్తం  $A_3 = 133.1\% \text{ of } 3000 = 3993$

vi) " " " చుక్క ( $C.I_1 + C.I_2 + C.I_3$ ) = 993  
 $(33.1\% \text{ of } 3000)$

- (VII) తేవం పెద్దఁఁసంగా చూవ  $C.I_1 = 10\% \text{ of } 3000 = 300$   
 (VIII) " " రెండవ సంగా " "  $C.I_2 = 11\% \text{ of } 3000 = 330$   
 (IX) " " మహాండు సంగా " "  $C.I_3 = 363$   
 $(121\% \text{ of } 3000)$

Method 3:



- (i)  $A_1 = 3300$   
 (ii)  $C.I. = 300$   
 (iii)  $A_2 = 3630$   
 (iv)  $C.I. (C.I_1 + C.I_2) = 630$   
 (v)  $A_3 = 3993$   
 (vi)  $C.I. (C.I_1 + C.I_2 + C.I_3) = 993$   
 (vii)  $C.I_1 = 300$   
 (viii)  $C.I_2 = 330$   
 (ix)  $C.I_3 = 363.$

చూయవడ్కి		చక్కనిపుడ్కి		
SI	A	CI	A	
$r = 10\%$				
1 సం    చెవరులు	10%	110%	10%	110%
2 సం	20%	120%	21% [only 2 <sup>nd</sup> yr = 11%]	121%
3 సం    చెవరులు	30%	130%	33.1% [only 3 <sup>rd</sup> yr = 12.1%]	133.1%
4 సం	40%	140%	46.41% [only 4 <sup>th</sup> yr = 13.31%]	146.41%
$r = 20\%$				
1 సం    చెవరులు	20%	120%	20%	120%
2 సం	40%	140%	44%	144%
3 సం	60%	160%	72.8%	172.8%
$r = 80\%$				
1 సం    చెవరులు	80%	180%	30%	130%
2 సం	60%	160%	69%	169%

Q2)  $P = 2560, r = 6 \frac{1}{4}\% \text{ p.a}$   
(చూయవడ్కి నాటికైన్ని)

$t = 2 \text{ yrs}, A = ?, CI = ?$

Sol: వెబత్తి = అనల + వడ్కి  
 $= 100\% + 6.25$   
 $= 1 + \frac{1}{16}$

తేడా = చక్కనిపుడ్కి  $\Rightarrow \frac{17}{16} - \frac{3050}{32000}$   
 $\Rightarrow \frac{17}{16} - \frac{3}{4}$  అనల  
 $\Rightarrow \frac{1}{16}$  సంసీలనీ

$$= \left(\frac{17}{16}\right)^2$$

$\Rightarrow \frac{289}{256} - \frac{3050}{32000}$   
 $\Rightarrow \frac{289}{256} - \frac{3}{4}$  అనల  
 $\Rightarrow \frac{1}{256}$  సంసీలనీ

(i) P  $\xrightarrow{\times 10} 2560$

R  $\xrightarrow{\times 10} ? 2890$

(ii) P  $\xrightarrow{\times 10} 2560$

CI  $\xrightarrow{\times 10} 330$

Q3)  $P = 4320, r = 16 \frac{2}{3}\% \text{ (p.a)}$ ,

$t = 3 \text{ yrs}$ , చక్కనిపుడ్కి, చూయవడ్కికి తేడాబంత?

Sol: వెబత్తి = అనల + వడ్కి  
 $= 100\% + 16 \frac{2}{3}\%$

$$= 1 + \frac{1}{6}$$

$$= \frac{7}{6} - \frac{3050}{32000}$$

తేడా = CI.



3 வருடங்கள்

$$\left(\frac{1}{6}\right)^3 = \frac{343 - A}{216 - P} \quad \text{தீட்டு CI = 127.}$$

$$P = 216, r = 16\frac{2}{3}\% = \frac{1}{6}$$

$$1 \text{ வருட } SI = \frac{1}{6} \times 216 = 36$$

$$3 \text{ வருட } SI = 3 \times 36 = 108$$

$$CI \& SI \text{ தீட்டு} = 127 - 108 = 19$$

$$) 216 \xrightarrow{\times 20} 4320$$

$$\text{கு } 19 \xrightarrow{\times 20} 380$$

OR



Method 2:

\* Imp formula's.

$$2 \text{ வருடங்கள் } SI \& CI \text{ தீட்டு} = \frac{PR^2}{100^2} \quad (\text{OR}) P(R)$$

$$3 \text{ வருடங்கள் } SI \& CI \text{ தீட்டு} = \frac{PR^2}{100^2} \left( \frac{300+R}{100} \right) \\ (\text{அல்லது}) \\ = PR^2 (3+R)$$

$$3 \text{ வருட } SI \& CI \text{ தீட்டு} = PR^2 (3+R) \quad (R = 16\frac{2}{3}\%)$$

$$R = 16\frac{2}{3}\% = \frac{1}{6}$$

$$= PR^2 (3+R)$$

$$= 4320 \left(\frac{1}{6}\right)^2 (3+\frac{1}{6})$$

$$= 4320 \left(\frac{1}{36}\right) \left(\frac{19}{6}\right)$$

$$= 380$$

R.S. Aggarwal Book

Most FAQ = 4%

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

$$-A = P + I \\ = 1 + \frac{1}{25} = \frac{26}{25} - P$$

$$\begin{array}{c|c} \frac{1}{25} & \frac{26}{25} \\ \hline \left(\frac{26}{25}\right)^2 & = \frac{676}{625} - A \\ \hline & \frac{676}{625} - P \end{array}$$

$$\begin{array}{c|c} 3 \text{ வருட} & 4 \text{ வருட} \\ \hline \left(\frac{26}{25}\right)^3 & \left(\frac{26}{25}\right)^4 \\ \hline = \frac{15576}{15625} & = \frac{456976}{390625} \end{array}$$

most FAQ 5 %

$$5\% = \frac{B}{100} = \frac{1}{20}$$

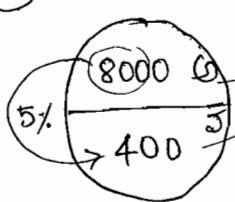
$$-A = P + I \\ = 1 + \frac{1}{20} = \frac{21}{20}$$

$$\begin{array}{c|c} \frac{1}{20} & \frac{21}{20} \\ \hline \left(\frac{21}{20}\right)^2 & = \frac{441}{400} - A \\ \hline & \frac{441}{400} - P \end{array}$$

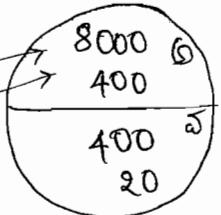
$$\begin{array}{c|c} 3 \text{ வருட} & 4 \text{ வருட} \\ \hline \left(\frac{21}{20}\right)^3 & \left(\frac{21}{20}\right)^4 \\ \hline = \frac{9261}{8000} & = \end{array}$$

# R.S. AGGARWAL BOOK

①



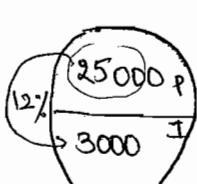
1 వ సంవత్సరము



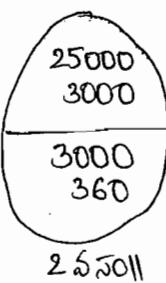
2 వ సంవత్సరము

$$\text{మొత్త} = 8820$$

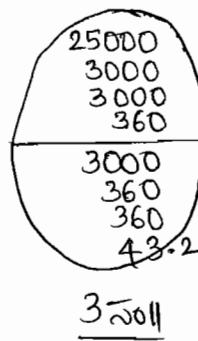
②



1 సంవత్సరము



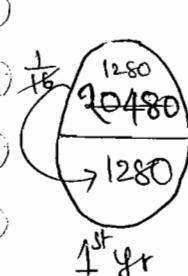
2 వ సంవత్సరము



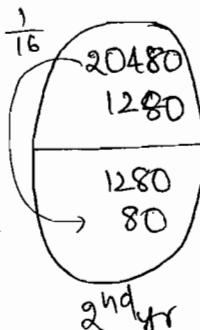
3 సంవత్సరము

$$\begin{aligned} CI &= 9000 \\ &\quad 1080 \\ &\quad \underline{143.2} \\ &\underline{10123.2} \end{aligned}$$

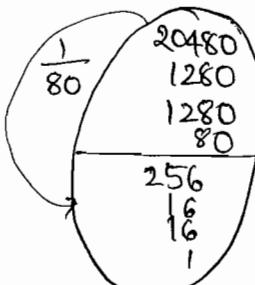
③



1st yr



2nd yr

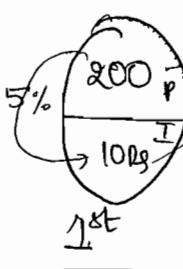


~ నవమిశ్రము

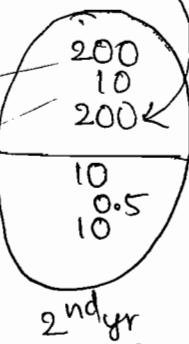
$$\begin{aligned} 1280 \\ 1280 \\ 256 \\ 80 \\ 33 \\ \hline 2929 \end{aligned}$$

$$\begin{aligned} 365 \rightarrow \frac{1}{16} \\ 738 \rightarrow ? \\ = 738 \times \frac{1}{16} \\ = \frac{365}{5} \\ = \frac{1}{80} \end{aligned}$$

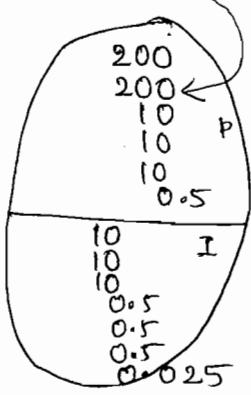
④



1st



2nd yr



3rd

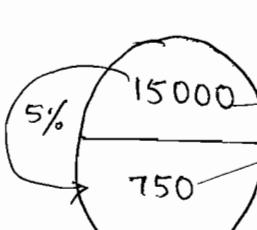
$$\begin{aligned} 5\% \ 0.5 \\ = \frac{5}{100} \times 0.5 \\ = 0.05 \times 0.5 \\ = 0.025 \end{aligned}$$

$$\begin{array}{r} 600 \\ 60 \\ 2 \\ \hline 0.025 \\ \hline 62.025 \end{array}$$

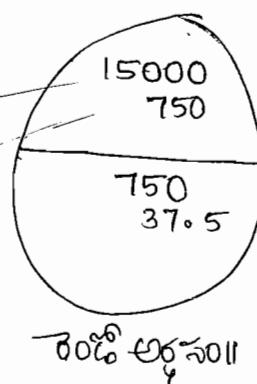
⑤

$$r = 10\% \text{ p.a}$$

సత్కరణ లభసాల తెల్పినే  $r = 5\% \text{ halfyearly}$



మొత్తాల్పు సంవత్సరము



మొత్తాల్పు సంవత్సరము

$$15000$$

$$1500$$

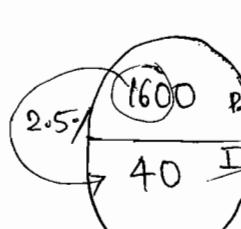
$$37.5$$

$$\hline 16537.5$$

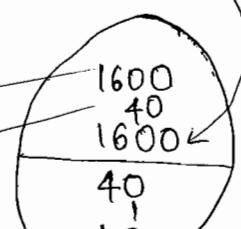
⑥

$$r = 5\% \text{ p.a.}$$

సత్కరణ లభసాల  $r = 2.5\% \text{ halfyearly}$ .



మొదటి సంవత్సరము



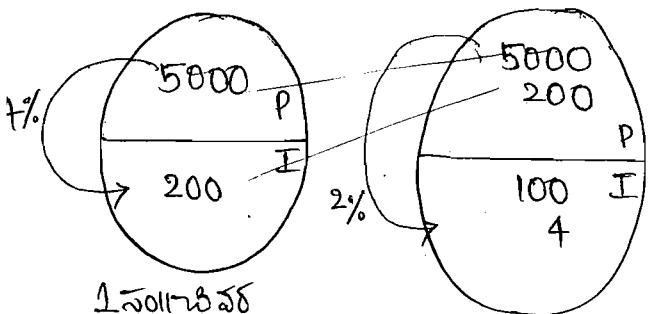
మొదటి సంవత్సరము

$$\begin{aligned} \text{మొత్తాల్పు} &= 40 + 40 + 1 + 40 \\ &= 121 \end{aligned}$$

$$2.5 = \frac{10\%}{4}$$

⑦

7) సాధారణ వ్యత్యాస తేజిస్తే  $r = 4\% \text{ p.a.}$



1 సాధారణ వ్యత్యాస

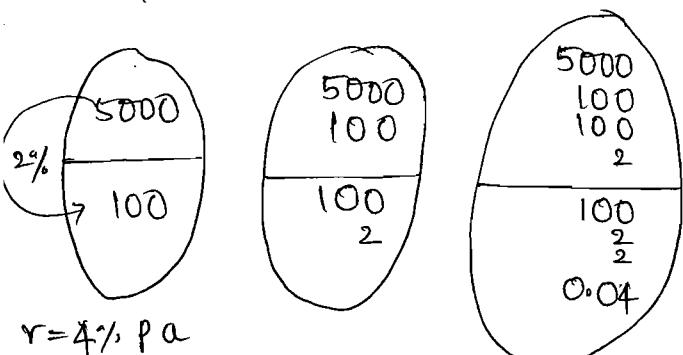
అధికంగా వ్యత్యాస

$r = 4\% \text{ p.a.}$

అధికంగా  $r = 2\% \text{ half year}$

$$\text{వ్యత్యాస} CI = 200 + 100 + 4 = 304 \text{ Rs.}$$

అధికంగా చక్కనిట్లు తేజిస్తే



$r = 4\% \text{ p.a.}$

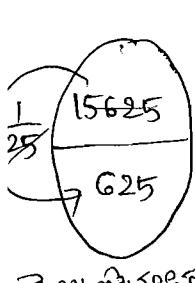
$r = 2\% \text{ half year}$

$$\text{వ్యత్యాస} CI = 300 + 6 + 0.04 = 306.04$$

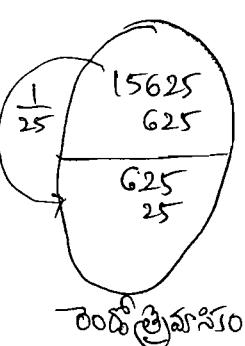
$$CI \text{ ల మధ్య తేజిశాఖ = } 304 - 306.04 = 2.04$$

8)  $r = 16\% \text{ p.a.}, t = 9 \text{ సాయంత్రికాలం}$

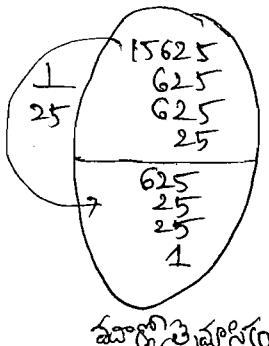
$$\text{వ్యత్యాస తేజిస్తే} r = 4\% = \frac{4}{100} = \frac{1}{25}$$



మొత్తాలు ప్రాప్తిస్తుంది



మొత్తాలు ప్రాప్తిస్తుంది

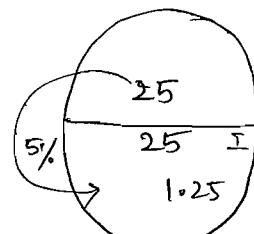
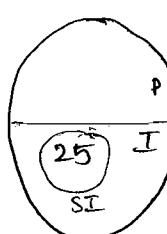


మొత్తాలు ప్రాప్తిస్తుంది

$$\begin{array}{r} 1875 \\ 75 \\ 1 \\ \hline 1951 \end{array}$$

9)  $2 \text{ సాధారణ వ్యత్యాస} = 50 \text{ Rs}, r = 5\%$

$$1 \text{ సాధారణ వ్యత్యాస} = 25 \left( \frac{50}{2} \right)$$



$$\begin{aligned} &= 5\% \cdot 25 \\ &= 1.25 \end{aligned}$$

$$CI = 25 + 25 + 1.25 \Rightarrow 51.25$$

మనం తెలుగు కుసుమం ద్వారా చేసామని.

10)  $r = 10\% \text{ పాయిస్టులు.}$

$$SI = 40\%$$

$$CI = 46.41\%$$

$$\text{తేజిశాఖ = } 6.41\%$$

$$\begin{aligned} SI \text{ ల } CI \text{ ల తేజిశాఖ} &= 6.41\% \times 1000 \\ (4 \text{ సాధారణ}) &= 64.1 \text{ RS.} \end{aligned}$$

11)  $r = 10\% \text{ p.a.}$

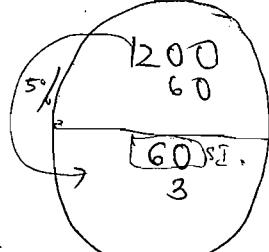
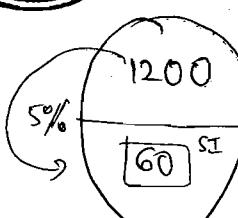
వ్యత్యాస అధికంగా  $r = 5\% \text{ half year}$

$$2 \text{ అధికంగా} (r = 5\%)$$

$$SI \text{ ల } CI \text{ ల తేజిశాఖ} = \frac{Pr^2}{100^2} = \frac{1200 \times 5 \times 5}{100 \times 100} = 3 \text{ RS.}$$

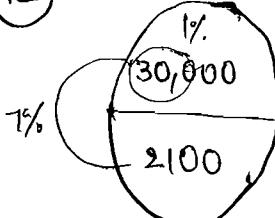
SPOORTI  
\* HYD. \*

OR

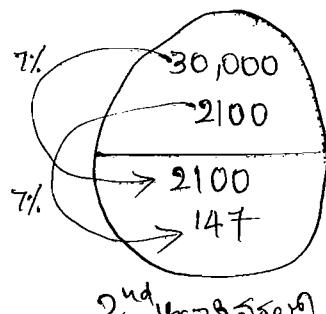


$$\text{తేజిశాఖ = } 3 \text{ RS.}$$

12)



1 yr నుండి వరుసాలి



2nd yr నుండి వరుసాలి

$$\begin{aligned} CI_1 &= 2100 \\ CI_2 &= 2100 \\ &\quad 147 \\ \hline &\quad 4347 \end{aligned}$$

Ans :- 2 సంవత్సరాలు

(OR)

$$\begin{aligned} P &= 30,000 \\ CI &= 4347 \\ A &= P + I \\ &= 30,000 + 4347 \\ A &= 34347 \end{aligned}$$

$$\begin{aligned} A &= P \left(1 + \frac{r}{100}\right)^n \\ 34347 &= 30,000 \left(1 + \frac{r}{100}\right)^n \\ \frac{34347}{30,000} &= \left(\frac{107}{100}\right)^n \end{aligned}$$

$$\left(\frac{107}{100}\right)^2 = \left(\frac{107}{100}\right)^n \quad (\text{ధూమయిస్వసు క్రమాలు సవానో})$$

$n = 2$  సం.



$$14) P=? , r = \frac{6}{4}\% , t = 3 , A = 4913$$

ప్రశ్నలో = అసంఖ్య విధి

$$A = 100\% + 6.25\%$$

$$= 1 + \frac{1}{16}$$

$$A = \frac{17}{16} \quad \begin{matrix} \text{ప్రశ్నలో} \\ \text{అసం} \end{matrix} \quad \begin{matrix} \text{తేదీ} = CI \\ \text{అసం} \end{matrix}$$

1 సం.

$$\left(\frac{17}{16}\right)^2 = \frac{289}{256} \rightarrow A \quad \begin{matrix} \text{తేదీ} = CI \\ \text{అసం} \end{matrix}$$

2 సం.

$$\left(\frac{17}{16}\right)^3 = \frac{4913}{4096} \rightarrow A \quad \begin{matrix} \text{తేదీ} = CI \\ \text{అసం} \end{matrix}$$

$$15) r = 4\% = \frac{4}{100} = \frac{1}{25}$$

ప్రశ్నలో = అసం + విధి

$$= 100\% + 4\%$$

$$= 1 + \frac{1}{25}$$

$$= \frac{26}{25} \quad \begin{matrix} \text{ప్రశ్నలో} \\ \text{అసం} \end{matrix} \quad \begin{matrix} \text{తేదీ} = CI \\ \text{అసం} \end{matrix}$$

$$P \times \frac{26}{25} \times \frac{26}{25} = 169 = (13 \times 2)$$

$$P = \frac{625}{4} = 156.25\%$$

$$16) r = 10\% \text{ p.a, } [\text{అధ్యాసాల్టిఫెస్ } r = 5\% \text{ half year}]$$

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

$$926.1 = 800 \left(1 + \frac{5}{20}\right)^n$$

$$\frac{9261}{8000} = \left(\frac{21}{20}\right)^n$$

$$\left(\frac{21}{20}\right)^3 = \left(\frac{21}{20}\right)^n \quad (\text{ధూమయిస్వసు గ్రహించి మూత్రాల సమసు})$$

$$n = 3 \quad [ \text{అసం } n = 1 \frac{1}{2} \text{ సం}]$$

(3 అధ్యాసాల్టిఫెస్).

$$\sqrt{\frac{11236}{10000}} = 1 + \frac{r}{100}$$

$$\frac{106}{100} = 1 + \frac{r}{100}$$

$$1 + \frac{6}{100} = 1 + \frac{r}{100}$$

$$\frac{6}{100} = \frac{r}{100}$$

$$r = 6$$

$$\begin{aligned} 17) \quad A &= P + I \\ &= 100\% + 12.5\% \\ &= 1 + \frac{1}{8} \end{aligned}$$

$$A = \frac{9}{8} \rightarrow \text{ప్రతితో} \leftarrow CI$$

$$\left(\frac{9}{8}\right)^2 = \frac{81}{64} \rightarrow \text{ప్రతితో} \leftarrow CI = 17$$

$$P = 64 \text{ అందులు}$$

$$2 \text{ సంవత్సరాలు } SI = 2 \times \frac{1}{8} \times 64 = 16 \text{ Rs}$$

$$17 \xrightarrow{\times 30} 510$$

$$16 \xrightarrow{\times 30} ? \quad \frac{16 \times 30}{17} = 480$$

$$18) \quad r = 10\%$$

$$2 \text{ సంవత్సరాలు } CI = 21\%, P = 525$$

$$\frac{3.21}{100} P = \frac{75.25}{525}$$

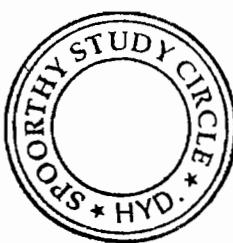
$$P = 2500$$

$$P = 2500, t = 2 \text{ సంవత్సరాలు} = 4 \text{ yrs},$$

$$\text{వ్యక్తిగతి} = \text{సగంవ్యక్తిగతి} = \frac{10\%}{2} = 5\%$$

$$SI = 20\% \cdot \frac{2500}{2500}$$

$$= 500$$



$$\begin{array}{c|c} \text{SI} & \text{CI} \\ \hline \text{సవాలు} & \text{సగం} \end{array}$$

$t = 3 \text{ yrs}, r = 8\%$   
 $SI = 24\%, P = 420$   
 $\frac{24}{100} P = \frac{70}{420}$   
 $P = 1750$

$P = 4000, r = 10\%, 2 \text{ సంవత్సరాలు}$   
 $(10\%)$   
 $2 \text{ సంవత్సరాలు } CI = 21\% \cdot 4000$   
 $CI = 840$   
 $\text{సగం} = \frac{840}{2} = 420$

SI	CI
$6 \text{ సంవత్సరాలు} = 60\%$	$r = 10\%$
$1 \text{ సంవత్సరాలు} = 10\%$	$t = 3 \text{ సంవత్సరాలు}$
$r = 10\%$	$CI = 33.1 \times 120000$
	$CI = 331 \times 12$
	$CI = 3972$

$$\begin{aligned} 2 \text{ సంవత్సరాలు } SI \text{ అంశము} &= \frac{PR^2}{100^2} = 96 \\ \frac{3.1 \times 15000 \times R^2}{100^2} &= 96 \\ \frac{15000 \times R^2}{10000} &= 96 \\ R^2 &= 64 \\ R &= 8\% \end{aligned}$$

$$\begin{aligned} 2 \text{ సంవత్సరాలు } CI \text{ అంశము} &= \frac{PR^2}{100^2} = 1 \text{ Rs} \\ &= \frac{P \times R \times R}{100 \times 100} = \frac{1}{25} \\ P &= 625 \end{aligned}$$

$$\begin{aligned} 23) \quad 2 \text{ సంవత్సరాలు } SI &= 800 \\ 4 \text{ సంవత్సరాలు } SI &= 400 \\ 2 \text{ సంవత్సరాలు } CI &= 832 \\ 2 \text{ సంవత్సరాలు } SI \text{ అంశము} &= 832 - 800 = 32 \end{aligned}$$

32 అనేక 400 లక్ష రూపాయిల విలువాన్ని?

$$= \frac{3.2}{400} \times 100 = 8\%$$

$$2 \text{ సంవత్సరాలు } CI \text{ అంశము} = \frac{PR^2}{100^2} = 32$$

$$\begin{aligned} 3 \text{ సంవత్సరాలు } " &= \frac{PR^2}{100^2} \left( \frac{300+R}{100} \right) \\ &= 32 \left( \frac{300+8}{100} \right) \\ &= 32(3.08) \\ &= 98.56 \end{aligned}$$

24

SI	CI
$r = 10\% \text{ p.a}$	$r = 10\% \text{ p.a}, t = 2 \text{ years}$
$P = 1,60,000$	ලත් මාන්‍ය රු 5% (ඇතුළු)
$2 \text{ years} SI =$ $= 20\% (160,000)$ $= 32000$	$A = P + I$ $= 100\% + 5\%$ $= 1 + \frac{1}{20}$ $= \frac{21}{20} \rightarrow \text{මුදල} \leftarrow \text{මිදා}$ $\frac{(21)}{20}^4 = \frac{194481}{160,000} \rightarrow A$ $160,000 \rightarrow P$ මිදා CI = $34481$ + ඇතුළු

$$2 \text{ years } SI = 32000 \quad CI = 34481$$

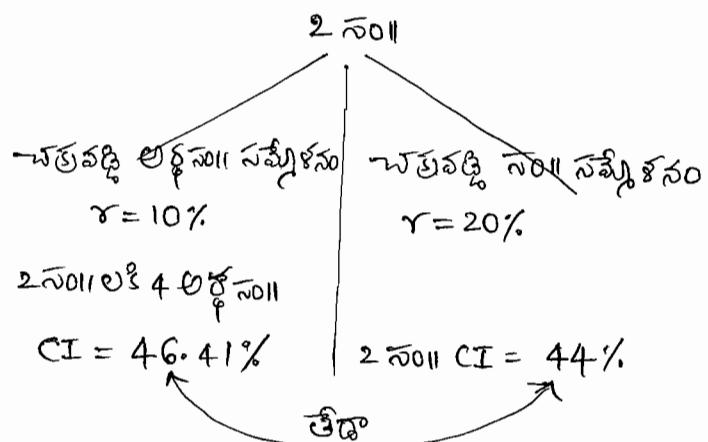
$$SI + CI \text{ ජේදා } = 2481$$

$$160000 \xrightarrow{\div 100} 1600$$

$$2481 \xrightarrow{\div 100} ? \Rightarrow 24.81$$

26

$$r = 20\% \text{ p.a.}$$



$$2.41\% \rightarrow 482$$

$$100\% \rightarrow ? = \frac{100 \times 482}{2.41} = 20000$$

27

$$2 \text{ years } SI = 600$$

$$1 \text{ year } SI = 300 \leftarrow$$

$$2 \text{ years } SI + CI \text{ ජේදා } = 600.3 - 600 = 36.3$$

36.3 යෙනි 300 එකට මැත්තා?

$$= \frac{1.1}{36.3} \times 100 = 11\%$$

28

$$r = 6\% \text{ p.a}$$

$$\text{අභ්‍යන්තර } r = 3\% \text{ half yearly}$$

$$\text{Overall} = a + b + \frac{ab}{100}$$

$$= 3 + 3 + \frac{3 \times 3}{100}$$

$$= 6 + 0.09$$

$$= 6.09\%$$

25

CI නො පෙනී	CI නො පෙනී
SI + CI ජේදා	SI + CI ජේදා
$2 \text{ years } SI + CI \text{ ජේදා}$	$r = 10\% \text{ p.a}$
$\frac{PR^2}{100^2} = 16$	$\text{අභ්‍යන්තර } = 5\% = \frac{1}{20}$
$\frac{P \times 10 \times 10}{100 \times 100} = 16$	$A = P + I$ $= 100\% + 5\%$ $= 1 + \frac{1}{20}$ $= \frac{21}{20} \rightarrow A \leftarrow \text{මිදා}$ $\frac{21}{20} \rightarrow P \leftarrow CI$
$P = 1600$	$2 \text{ years } 10\% + \text{අභ්‍යන්තර} \text{ ප්‍රතිලශ්‍යා }$
	$\Rightarrow \left( \frac{21}{20} \right)^4$
	$= \frac{194481}{160000} \rightarrow A \leftarrow \text{මිදා}$ $160000 \rightarrow P \leftarrow CI$ (34481)

$$29) \frac{3\text{ సా|| SI } \text{ అంతర్ము}}{2\text{ సా|| SI } \text{ అంతర్ము}} = \frac{25}{8}$$

$$x = \frac{12000}{271}$$

$$x = 12000$$

$$\frac{\cancel{PR^2}}{100^2} \left( \frac{300+R}{100} \right) = \frac{25}{8}$$

$$\frac{\cancel{PR^2}}{100^2} = \frac{25}{8}$$

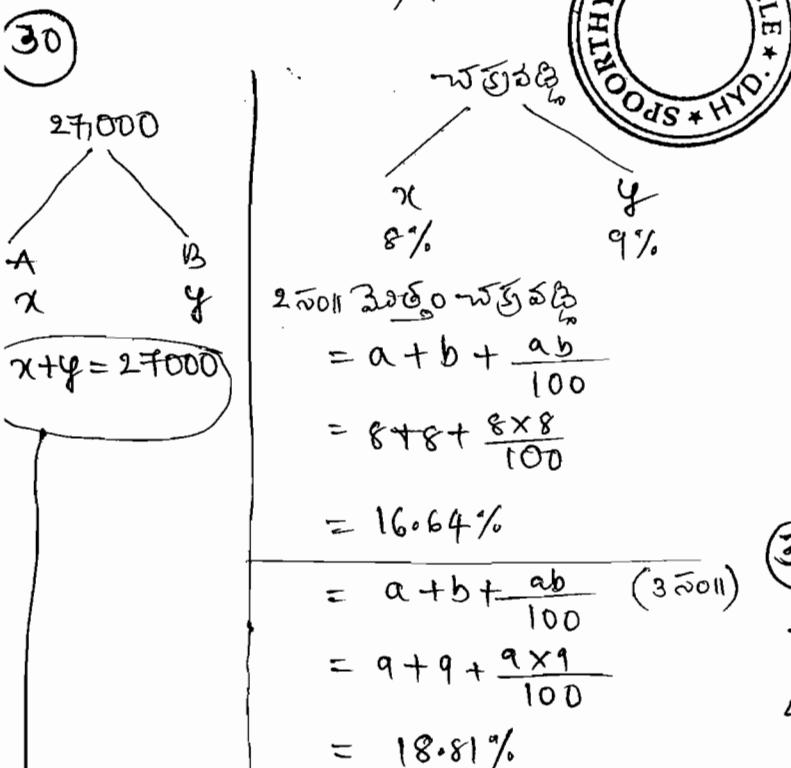
$$\frac{300+R}{100} = \frac{25}{8}$$

$$2(300+R) = 625$$

$$600+2R = 625$$

$$2R = 25$$

$$R = 12.5\%$$



$$16.64\%x + 18.81\%y = 4818.30$$

$$1664x + 1881y = 4818.3 \times 10000$$

$$1881x + 1881y = 1881 \times 27000$$

$$1664x + 1881y = 48183000$$

$$217x = 50787000$$

$$-48183000$$

$$\underline{2604000}$$

31)

$$\begin{aligned} \text{3 సా|| ప్రాతి } A_3 &= 800 \\ \text{4 సా|| ప్రాతి } A_4 &= 840 \end{aligned}$$

[ 3 సా|| క్రమిన ప్రాతి 4 వసా|| అనుభవాలు 08 ]

40 లక్షల సార్లల విలువాలు?

$$\begin{aligned} &= \frac{40}{800} \times 100 \\ &= 5\% \end{aligned}$$

OR

$$\frac{A_4}{A_3} = \frac{P \left(1 + \frac{r}{100}\right)^4}{P \left(1 + \frac{r}{100}\right)^3}$$

$$\frac{840}{800} = 1 + \frac{r}{100}$$

$$\frac{21}{20} = 1 + \frac{r}{100}$$

$$1 + \frac{1}{20} = 1 + \frac{r}{100}$$

$$\frac{1}{20} = \frac{r}{100}$$

$$r = 5\%$$

32)

$$A_2 = P \left(1 + \frac{r}{100}\right)^2 \quad | \quad A_3 = P \left(1 + \frac{r}{100}\right)^3$$

$$4624 = P \left(1 + \frac{r}{100}\right)^2 \quad | \quad 4913 = P \left(1 + \frac{r}{100}\right)^3$$

$$\frac{A_3}{A_2} = \frac{4913}{4624} = \frac{P \left(1 + \frac{r}{100}\right)^3}{P \left(1 + \frac{r}{100}\right)^2}$$

$$1 + \frac{2891}{4624} = 1 + \frac{r}{100}$$

$$\frac{1}{16} = \frac{r}{100}$$

$$r = \frac{100}{16} = 6.25\%$$

$$4624 = P \left(1 + \frac{r}{100}\right)^2$$

$$4624 = P \left(1 + \frac{r}{16}\right)^2$$

$$\cancel{4624} = P \times \cancel{16} \times \cancel{16}$$

$$P = 16 \times 16 \times 16$$

$$P = 4096$$

(33)

$$\begin{array}{l|l} A_3 = P \left(1 + \frac{r}{100}\right)^3 & A_6 = P \left(1 + \frac{r}{100}\right)^6 \\ \hline 13380 = P \left(1 + \frac{r}{100}\right)^3 & 20670 = P \left(1 + \frac{r}{100}\right)^6 \end{array}$$

$$\frac{A_6}{A_3} = \frac{P \left(1 + \frac{r}{100}\right)^6}{P \left(1 + \frac{r}{100}\right)^3} = \frac{20670}{13380}$$

$$\left(1 + \frac{r}{100}\right)^3 = \frac{20670}{13380}$$

$$13380 = P \left(\frac{20670}{13380}\right)$$

$$P = \frac{13380 \times 13380}{20670 - 669} = 8920$$

(34)

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

$$2P = P \left(1 + \frac{r}{100}\right)^5$$

ఇరువైశాల ఫూతు '4' తీస్తోట

$$(2P)^4 = \left(P \left(1 + \frac{r}{100}\right)^5\right)^4$$

$$16P^4 = P^4 \left(1 + \frac{r}{100}\right)^{20}$$

$$16P = P \left(1 + \frac{r}{100}\right)^{20}$$

$$P = 12,000$$

$$\begin{aligned} A &= 16P = 16 \times 12000 \\ &= 1,92,000 \end{aligned}$$

$$(35) \quad A = P \left(1 + \frac{r}{100}\right)^{5n}$$

$$2P = P \left(1 + \frac{r}{100}\right)^5$$

ఫూతు '3' చేయగా

$$(2P)^3 = P \left(P \left(1 + \frac{r}{100}\right)^5\right)^3$$

$$8P^3 = P^3 \left(1 + \frac{r}{100}\right)^{15}$$

$$8P = P \left(1 + \frac{r}{100}\right)^{15}$$

15 సాలు Answer.

$$3P = P \left(1 + \frac{r}{100}\right)^4$$

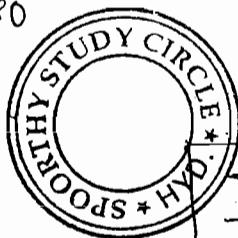
ఫూతు '3' చేయగా

$$(3P)^3 = \left(P \left(1 + \frac{r}{100}\right)^4\right)^3$$

$$27P^3 = P^3 \left(1 + \frac{r}{100}\right)^{12}$$

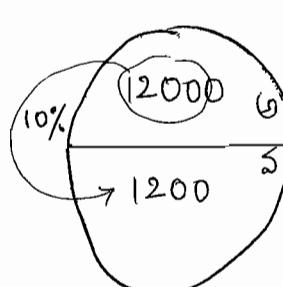
$$27P = P \left(1 + \frac{r}{100}\right)^{12}$$

$$P = 12 \text{ సాలు}$$



### Installments in Compound Interest

(Q) దీనవ్వకి 10% P.A చెతువ్వు చొస్తున 12000 రూపాయిలు లుపు తీసుకుని మొదటిసాలు వోయిదు 7000 చెల్లాడు, అతని అస్త్రమొత్తం తీర్చువడానియి చెల్లాయివలసిన 2వ వాయిదా ఏంత?

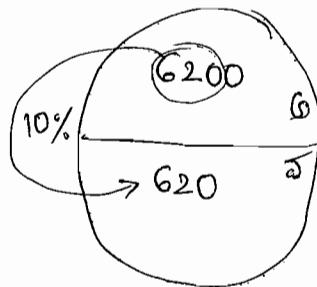


1వ సాలు చెరువు

$$\text{మొత్తం} = 13200$$

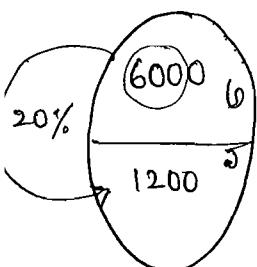
$$\text{వాయిదా} - 7000$$

$$6200$$

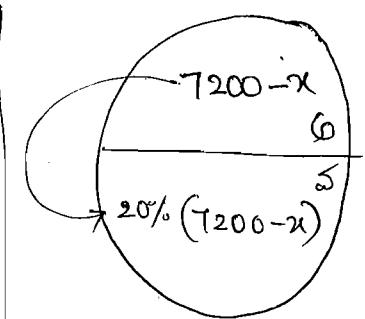


$$\begin{array}{r} \text{మొత్తం} = 6200 \\ - 6200 \\ \hline 6820 \end{array}$$

Q2) ఒకవ్యక్తి 20% P.a చెరువద్దీ చూశున  
6000 రూ॥ ప్రశ్నలోనుట్టు మొదటి సాలు వ్యాయద  
క్రితి సామాన్య చెల్లిటి, రెండు సాలులు || వ్యాయద 5040  
రూ॥ చెల్లిటి ఏలు || వ్యాయద ఎంత?



$$\begin{array}{r} \text{మొత్త} 7200 \\ \text{ప్రశ్నలో} -x \\ \hline \text{సగించి} 7200-x \end{array}$$



$$\begin{aligned} 120\% (7200 - x) &= 5040 \\ \frac{6}{5} (7200 - x) &= 5040 \\ 7200 - x &= 4200 \\ x &= 3000 \end{aligned}$$

### Equal Instalments in Compound Interest

Q1) 4200 రూ॥ ప్రశ్నలోను 10% P.a. చెరువద్దీ చూశున రెండు సాలు వ్యాయదాల్లో తీవ్రిగి చెల్లిటి  
ఉట్టికి వ్యాయద ఏంత?

$$r = 10\% \Rightarrow \frac{1}{10}$$

$$A = P + I = 100\% + 10\%$$

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

$$= \frac{11}{10} \rightarrow \text{Amount/Instalment}$$

$$10 \rightarrow \text{Principal}$$

$$1^{\text{st}} \text{ yr } \left( \frac{P}{10} + \frac{A+I}{11} \right) \times 11$$

$$2^{\text{nd}} \text{ yr } 100 \quad 121$$

$$\text{మొత్తం } P = 210 \quad \text{1st Instalment} = 121$$

$$210 \xrightarrow{\times 20} 4200$$

$$121 \xrightarrow{\times 20} 2420 \rightarrow \cancel{121 \times 1200} \xrightarrow{\times 20} 2420$$

$$\frac{121 \times 4200}{210} = 2420$$

37)  $r = 20\% = \frac{1}{5}$

$$A = P + I$$

$$= 100\% + 20\%$$

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

$$= \frac{6}{5} \rightarrow A (\text{అందు})$$

$$\frac{6}{5} \rightarrow P (\text{మొత్తం})$$

1 సాలు ||

$\frac{36}{25} \rightarrow A$	$\frac{216}{125} \rightarrow A$	$\frac{1296}{625} \rightarrow A$
$\frac{25}{25} \rightarrow P$	$\frac{125}{125} \rightarrow P$	$\frac{625}{625} \rightarrow P$
2 సాలు	3 సాలు	4 సాలు

So, 4 సాలు కండుతం.

38)  $r = 4\% = \frac{4}{100} = \frac{1}{25}$

$$A = P + I$$

$$= 100\% + 4$$

$$= 1 + \frac{1}{25}$$

$$= \frac{26}{25} \rightarrow \text{Amount/Instalment}$$

$$25 \rightarrow \text{Principal}$$



1 <sup>st</sup>	Principle	Amnt/Instalmt
	(25 650)	26 ) × 26
2 <sup>nd</sup>	625	676

మొత్తం ప్రాణం

$$P = 1275$$

$$1275 \times 2 = 2550$$

(P)  $1275 \xrightarrow{\times 2} 2550$   
Intr  $676 \xrightarrow{\times 2} 1352$

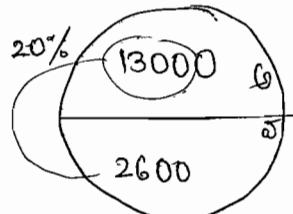
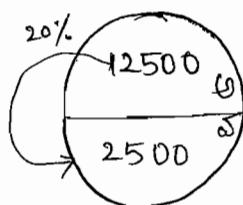
$$39) r = 5\% = \frac{1}{20}$$

$$\begin{aligned} A &= P + I \\ &= 100\% + 5\% \\ &= 1 + \frac{1}{20} \\ &= \underline{21} \rightarrow \text{Amount/Instmnt} \\ 20 &\rightarrow \text{Interest/Instmnt} \end{aligned}$$

	<u>Principle</u>	<u>Amnt/Instl</u>
1 <sup>st</sup>	(20 420)	21 ) $\times 21$ 441
2 <sup>nd</sup>	400	441
<u>Interest</u>		<u>Interest</u> $\text{பாய்வு}$
<u>Instl P</u> =	820	= 441

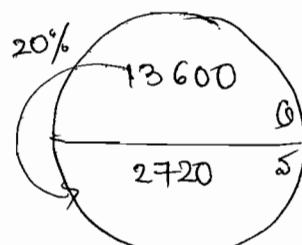
$$\begin{aligned} P &820 \rightarrow 1025 \\ \text{Instl } 441 \rightarrow ? &= \frac{110.25}{820} \times \frac{5}{205} \\ &= 551.25 \end{aligned}$$

40)



$$\begin{aligned} 1^{\text{st}} \text{ பாய்வு} - 2000 \\ \text{Interest} = 15000 \\ \hline 13000 \end{aligned}$$

$$\begin{aligned} 2^{\text{nd}} \text{ பாய்வு} = 15600 \\ 2^{\text{nd}} \text{ பாய்வு} = -2000 \\ \hline 13600 \end{aligned}$$



$$\begin{aligned} \text{Interest} = 16320 \\ 3^{\text{rd}} \text{ பாய்வு} - 2000 \\ \hline 14320 \end{aligned}$$

41)

$$\begin{aligned} A &= P + I \\ &= 100\% + 5\% \end{aligned}$$

$$= 1 + \frac{1}{20}$$

$$= \frac{21}{20} \rightarrow \text{செலவிடத் திட்டம்} | \text{பாய்வு} \\ 20 \rightarrow \text{பாய்வு}$$

<u>Principle</u>	<u>Instl/Amount</u>
1 <sup>st</sup> (20 420)	21 ) $\times 21$ 441
2 <sup>nd</sup> 400	441
<u>Interest P</u> = 820	<u>Interest</u> $\text{பாய்வு} = 441$

$$\text{Instl } 441 \times 2 \rightarrow 882$$

$$\text{Princ} 820 \times 2 \rightarrow ? = 1640$$



# AVERAGE

$$1. \text{ సరాసరి} = \frac{\text{రాషుల మొత్తం}}{\text{రాషుల సంఖ్య}}$$

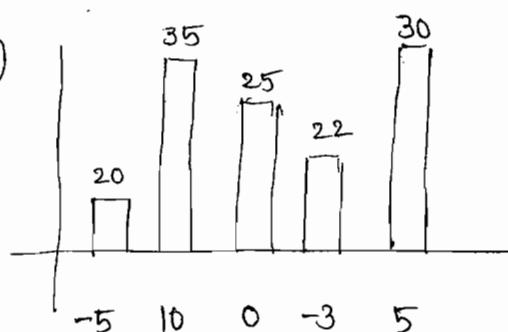
Ex: 28, 32, 30, 35, 27, 29 ల సరాసరి ఎంత?

$$\begin{aligned} \text{సరిపడి} &= \frac{28, 32, 30, 35, 27, 29}{6} \\ &= \frac{181}{6} = 30.166 \end{aligned}$$

(OR)

Method 2

- ఏదైనా 2 సంఖ్యలు సగటుగా ఉంటే అస్తిత్వము వుంది (30 ల సరాసరి అస్తిత్వము)
- అసుటున్న సరాసరిని త్రాతీసంఖ్యనుండి తీసివేయము
- $\rightarrow 2, 2/1, 0, 5, -3, -1$ , కలపండి = 1
- $\text{శీతాత్మకం} = 1$  లి 6 మంధికి సమానంగా వుండి  
 $= \frac{1}{6} = 0.1666 \dots$
- $30 + 0.16666 \dots = 30.1666 \dots$



$$\text{సగటు} = ?$$

$$\begin{aligned} 25 \text{ ను సగటుగా అస్తిత్వము. త్రాతీసంఖ్యనుండి} \\ \text{తీసివేయకా} &= 25 + \frac{1}{5} \\ &= 25 + 1.4 \\ &= 26.4 \end{aligned}$$

- (Q3) 30 మంధి విష్ణువు సగటు 20 సార్లు, టీచర్ రావథి సగటు 1 పెరియింగ్. టీచర్ వయింతు?
- Sol.: 30 మంధి సరాసరి = 20 సార్లు

$$\text{కొన్నటి ప్రతీ 2 సార్ల వయింగ్} = 20 \text{ సార్లు అట్టి.}$$

$$\begin{array}{ccccccc} 20, 20, 20 & \cdots & 20, & & & & 20 \\ +1 & +1 & +1 & & & & +1 \\ \hline & & (30 \text{ మంధి}) & & & & \end{array}$$

31 సార్లు

$$31 \text{ సార్లు} = \frac{31}{3} = 31$$

$$\text{కలిపి} = 20 \text{ సార్లు}$$

$$\begin{array}{c} \text{అంధార్థి కొమ్మన్} = 31 \text{ సార్లు} \\ \hline 51 \text{ సార్లు} \end{array}$$

(Q4)

ఒక క్రమంలో 10 మంధి విష్ణువు లగ్గించువలు

50 kg ల. || విష్ణువు చేరడం వలన ప్రారంభించి సరాసరి 2 kg ల తగ్గించి. || విష్ణువు వెంత?

10 మంధి త్రాతీసి బయలు 50 kg అట్టి॥

$$\begin{array}{ccccccc} 50, 50, 50 & \cdots & 50, & & & & 50 \text{ kg} \\ -2 & -2 & -2 & & & & -2 \\ \hline & & (10 \text{ మంధి}) & & & & \end{array}$$

|| వారాం

$$\text{మంధి} = 11 \times -2 = -22$$

$$\text{కలిపి} = 50 \text{ kg}$$

$$\begin{array}{c} \text{తగ్గించాలి} = -22 \\ \hline 28 \text{ kg} = \text{సరాసరి.} \end{array}$$

(Q5)

ఒక ఫ్లైమ్ప్లెన్ లో 15 ఇంచుల సరాసరి

30 వుండి. పత్తని 16 ఇంచుంచ్చులి 78

వచ్చుని చేస్తే సగటు ఎంత పెరియింగ్? శిక్షణ సరాసరి ఎంత?

$$\begin{array}{ccccccc} 30, 30, 30 & \cdots & 30, & & & & 30 \\ +3 & +3 & +3 & & & & +3 \\ \hline & & (15 \text{ ఇంచులు}) & & & & 16 \text{ వై} \end{array}$$

అసంచేసిన వుండి = 78

$$\begin{array}{c} \text{కొమ్మన్} = 30 \\ \hline \text{Extra} = 48 \end{array}$$

Extra 48 కి 16 మంధి సమానంగా పచుండి

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

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సరావరి 3 పెరిగింది

$$\text{కొత్త సరావరి} = 30 + 3 = 33.$$

- (Q6) బ్యాంకులు 15 రూప్పుల సరావరి 40  
ఎందుచూ, అతను 14 రూప్పుల లీ 8 వరు  
నుండి నూనచేసి ఎంత తగ్గింది. కొత్త సరావరి  
విలుతు?

$$\text{కుటీ} 15 \text{ రూప్పుల సరావరి} = 40$$

$$\text{కుటీ} 14 \text{ రూప్పులీ} 40 \text{ ఎందుచూ - } 11 \text{ మి.}$$

$$40, 40, 40, \dots, 40, \dots, 40$$

$$(15 \text{ రూప్పులీ}) \quad (16 \text{ రూప్పులీ})$$

$$\text{అసలుచేసింది} = 8$$

$$\begin{array}{r} \text{కొవాల్ఫులి} \\ \text{''} \\ \hline -32 \end{array}$$

సరావరి '32' గంచి సవారంగా ఎంచుకో

$$= \frac{-32^2}{16} = -2 \quad (\text{సరావరి } -2\text{ తగ్గింది})$$

$$= 40 - 2 = 38$$

### Weighted Average

$n_1, n_2, n_3, \dots$  ఏరిమానా | సంఖ్య | కొలింది

$x_1, x_2, x_3, \dots$  మౌళిక | ఒచువు | భర్తు | ధర

$$\text{సగింధి} = \frac{n_1 x_1 + n_2 x_2 + n_3 x_3 + \dots}{n_1 + n_2 + n_3 + \dots}$$

- (Q1)  $\frac{30 \text{ Rs}/\text{kg}}{10 \text{ కిలోల చిల్డ్రన్స్} + 40 \text{ Rs}/\text{kg}, 15 \text{ కిలో}$   
బిల్యూమణ్ట్ రెలిఫ్స్, ఈ మిశ్రమం ఉండి  
సరావరి ధర ఎంత?

$$\text{సరావరి ధర} = \frac{n_1 x_1 + n_2 x_2}{n_1 + n_2}$$

$$= \frac{10 \times 30 + 15 \times 40}{10 + 15}$$

$$= \frac{300 + 600}{25} = \frac{900}{25} = 36$$

- (Q2) కెండు టీ థర్లు వరుసగా 126 Rs/kg, 135 Rs/kg లను మాటలర్సం టీలీ 1:1:2  
నిష్టత్తులు కెఱిపెత్తే ఏప్పటిన మిశ్రమం సగింధి ధర  
153 Rs. లియెతె తెవర్సం టీ Kg ధర ఎంత?

$$\begin{array}{ccccccc} n_1 & & n_2 & & n_3 & & \text{మిశ్రమం} \\ 1 & : & 1 & : & 2 & & \text{ధర} \\ 126 \text{ Rs/kg} & & 135 \text{ Rs/kg} & & x \text{ Rs/kg} & = 153 \\ x_1 & & x_2 & & x_3 & & \end{array}$$

$$\text{సరావరి} = \frac{n_1 x_1 + n_2 x_2 + n_3 x_3}{n_1 + n_2 + n_3}$$

$$153 = \frac{1 \times 126 + 1 \times 135 + 2 \times x}{1+1+2}$$

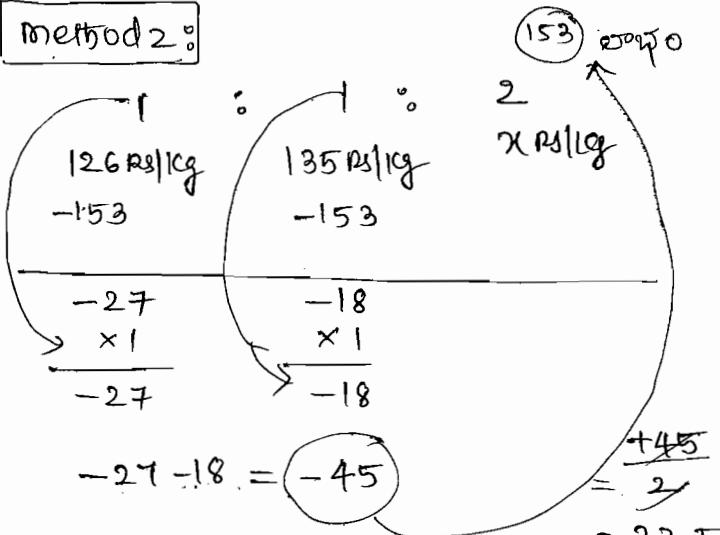
$$153 \times 4 = 261 + 2x$$

$$612 = 261 + 2x$$

$$2x = 351$$

$$x = 175.5$$

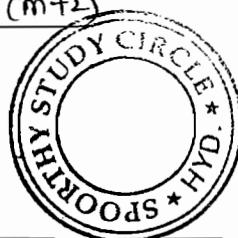
### Method 2:



$$\begin{array}{r} 153 \\ 22.5 \\ \hline 175.5 \end{array}$$

$$= \frac{+45}{2} = 22.5$$

	<u>ముత్తస్తి</u>	<u>నిఱస్తి Formula</u>
1) $1+2+3+\dots+n$	$\frac{n(n+1)}{2}$	$\frac{n(n+1)}{2} = \frac{n+1}{2}$
2) $1^2+2^2+3^2+\dots+n^2$	$\frac{n(n+1)(2n+1)}{6}$	$\frac{n(n+1)(2n+1)}{6} = \frac{(n+1)(2n+1)}{6}$
3) $1^3+2^3+3^3+\dots+n^3$	$\frac{n^2(n+1)^2}{4}$	$\frac{n^2(n+1)^2}{4} = \frac{n(n+1)^2}{4}$
4) $1+3+5+\dots(n\text{-సంఖ్య})$	$n^2$	$\frac{n^2}{2} = n$
5) $2+4+8+\dots(11)$	$n(n+1)$	$\frac{n(n+1)}{2} = (n+1)$
6) $1^2+3^2+5^2+\dots(11)$	$\frac{m(m+1)(m+2)}{6}$	$\frac{m(m+1)(m+2)}{6}$
7) $2^2+4^2+6^2+\dots(11)$	$\frac{m(m+1)(m+2)}{6}$	$\frac{m(m+1)(m+2)}{6}$



అంకుశిక్ష పద్ధతినాట్య ను =  $\frac{\text{సివిల్ నాట్య}}{\text{మెదటినాట్య}} + 1$   
వాట వుట్టి తేడు

Example:

- ప్రశ్న: తొందివాటినాట్య కన్నోటి? • 5
- 1, 2, 3, ..., 100  $\rightarrow 100 \rightarrow \frac{n+1}{2} = \frac{100+1}{2} = \frac{101}{2} = 50.5$
  - $1^2 2^2 3^2 \dots 20^2 \rightarrow 20 \rightarrow \frac{n+1(2n+1)}{6} = \frac{(21)(41)}{6} = \frac{287}{2} = \frac{143.5}{2} = 302.5$
  - $1^3 2^3 3^3 \dots 10^3 \rightarrow 10 \rightarrow \frac{n(n+1)^2}{4} = \frac{10(11)^2}{4} = \frac{10 \times 121}{4} = \frac{605}{2} = 302.5$
  - 1, 3, 5, ...,  $10^3 \rightarrow \frac{n=103-1}{2} + 1 = 52 \rightarrow$  చిందినాట్యలను 8 ను  $n = 52$

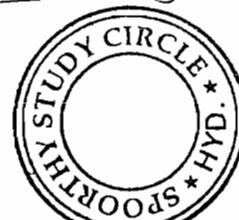
$$\textcircled{5} \quad 2, 4, 6, \dots, 104 \rightarrow n = \frac{104-2}{2} + 1 = 52 \rightarrow \text{எதிர்முறை நடவடிக்கை} = (n+1) = 52+1 = 53$$

$$\begin{aligned}
 & \text{Q6) } 1^2, 3^2, 5^2, \dots, 11^2 \rightarrow n = \frac{11-1}{2} + 1 = 6 \rightarrow \text{ចិនសម្រាប់បញ្ចូលសន្និសញ្ញា} = \frac{\overline{\text{ចិនសម្រាប់}}}{\overline{\text{សន្និសញ្ញា}}} \\
 & = \frac{m(m+1)(m+2)}{6} \\
 & = \frac{11(12)(13)}{6} \\
 & = \frac{143}{3} = 47 \cdot 66
 \end{aligned}$$

$$\textcircled{7} \quad 2^2, 4^2, 6^2, \dots \rightarrow n=6 \rightarrow \text{ಸರಿಸೂತ್ಯಾಗಲ ವರ್ಗಿಲನಕ್ಕಾಗಿ} = \frac{m(m+1)(m+2)}{6} \\ = \frac{12(13)(14)}{6} = \frac{182}{3} = 60.66.$$

$$\textcircled{8} \quad \text{නැංකය} = \frac{\text{රාමුලප්පාගේ}}{\text{රාමුල නොදු}} = \frac{1^2 + 2^2 + 3^2 + 4^2 + 5^2 + 6^2 + 7^2 + \dots}{1+2+3+4+5+6+7+ \dots}$$

$$\begin{aligned} n &= 7 \\ \frac{n(n+1)(2n+1)}{63} &= \frac{2n+1}{3} = \frac{2(7)+1}{3} = \frac{15}{3} = 5 \end{aligned}$$



## OBSERVATIONS

1

- ① ಲತ್ತಿಸಂಘ್ಯೇ ವಿಹ್ವಿಸಾ ಸಂಘ್ಯೀ ಕರ್ತವೀತಿ, ನರಾಸಗಿಕಿ ಕೂಡ ಶಿಸಂಘ್ಯನು ರಾಜೀನಾಮೆ.

② ಲತ್ತಿಸಂಘ್ಯೇ ವಿಹ್ವಿಸಾ ಸಂಘ್ಯೀ ತೀಸಿವೈಸ್ ॥ ॥ ॥ ತೀಸಿವೈಸಿನಟ್ಟೆ.

③ ॥ ॥ ॥ ಭೂರಿಸ್ತೆ ॥ ॥ ॥ ಭೂರಿಸ್ತೆ ॥ ॥ ॥ ಭೂರಿಸ್ತೆನಟ್ಟೆ.

④ ॥ ॥ ॥ ಗರ್ಭಿಸ್ತೆ ॥ ॥ ॥ ಗರ್ಭಿಸ್ತೆ ॥ ॥ ॥ ಗರ್ಭಿಸ್ತೆನಟ್ಟೆ.

$10, 20, 30$	$\text{ממוצע} = \frac{10+20+30}{3} = \frac{60}{3} = 20$
$12, 22, 32$	$\text{ממוצע} = 22 \leftarrow$
$8, 18, 28$	$\text{ממוצע} = 18 \leftarrow$
$20, 40, 60$	$\text{ממוצע} = 40 \leftarrow$
$5, 10, 15$	$\text{ממוצע} = 10 \leftarrow$

1) 16, 17, 18, 19, 20, ..., లనుసాంఖి?

వరువ సంఖ్యలనుసాంఖ్య (Count చేసినంఖ్య) =  
మధ్యార్ది-డిస్టన్చెన్స్ నుసాంఖ్య - ప్రత్యుంది.

2) 16, 17, 18, 19, 20, 21 లనుసాంఖి?

వరువ సంఖ్యలనుసాంఖ్య  $\left( \frac{\text{Count}}{\text{సంఖ్య}} \right)$  = మధ్యార్ది-డిస్టన్చెన్స్

$$2 \text{ సంఖ్యల సాంఖ్యకి సమాంగి} = \frac{18+19}{2} = 18.5$$

3) 430, 434, 438, 442, 446, లనుసాంఖి?

సమానతేడ్స్ గల సంఖ్యలు  $\left( \frac{\text{Count}}{\text{చేసినంఖ్య}} \right)$  = సాంఖ్యమధ్యి

మధ్యార్ది-డిస్టన్చెన్స్ నుసాంఖ్య - ప్రత్యుంది.

4) 430, 434, 438, 442, 446, 450 లనుసాంఖి?

సమానతేడ్స్ గల సంఖ్యలు  $\left[ \frac{\text{Count}}{\text{సంఖ్య}} \right]$  = సాంఖ్యమధ్యి

దీనిఱండ్ర సంఖ్యలనుసాంఖ్యకి సమాంగి.

$$\text{సాంఖ్య} = \frac{438+442}{2} = 440.$$



1) సాంఖ్య 70 అనుమతి

$$\begin{array}{r}
 76 & 65 & 82 & 67 & 85 \\
 -70 & -70 & -70 & -70 & -70 \\
 \hline
 6 & -5 & 12 & -3 & 15 = 25
 \end{array}$$

$$\text{సాంఖ్య} = 70 + \frac{25}{5} = 70+5 = 75$$

2)

Arun  $\rightarrow 65 < x < 72$

may be 66, 67, 68, 69, 70, 71

Brother  $\rightarrow 60 < x < 70$

May (60 - - - - 70)

Mother  $\rightarrow \dots < 68$

may (65, 66, 67, 68)

66, 67, 68

సాంఖ్య = 67

3) ప్రయోగం 20 సంఖ్యలలో 19 దీనిసంఖ్యకి,  
ఈ 19 దీనిసంఖ్యల ప్రయోగిస్తున్న లన్నిచేసిన విధంగా  
ఏ రూపం సంఖ్య సమాంగితుంది. సాంఖ్య సమాంగి  
అవడానికి మహాయాత్మి 19 సంఖ్యల డైట్రిక్షణ్యు.

4) 5 సంఖ్యల 6, 34 లనుసాంఖ్యి

$$10, 15, 20, 25, 30$$

సమానతేడ్స్ గల సంఖ్య, కొను సమాంగి = 20

5) 3 తిఱికిచెచుటి 5 గంభీరాల

$$3, 6, 9, 12, 15$$

$$\text{సాంఖ్య} = 9$$

$$\textcircled{6} \quad 2, 3, 5, 7, 11, 13, 17, 19, 23$$

$$\textcircled{7} \quad \text{వర్గాంగు = } \frac{\text{రాష్ట్రము}}{\text{రాష్ట్రము}} = \frac{100}{9} = 11.11$$

$$\textcircled{8} \quad 3, 11, 7, 9 - \text{అన్నింటినీ} - 12 \text{ చేయగా}$$

$$3, 11, 7, 9, 15, 13, 8, 19, 17, 21, 14, 2$$

$$-12 \quad -12 \quad -12 \quad -12 \quad -12 \quad -12 \quad -12$$

$$\underline{-9 \quad -1 \quad -5 \quad -3 + 3 + 1 - 4 + 7 + 5 + 9 + 2} = 5$$

$$50, \quad \begin{array}{r} 12 \\ -5 \\ \hline 7 \end{array} \quad \text{రాష్ట్రము}$$

$$\textcircled{8} \quad \text{సమాధానములు}$$

$$27, 6 \quad x$$

$$-5 - 5 - 5$$

$$\underline{-3 + 2 + 1}$$

$$\textcircled{9} \quad x = 5$$

$$+8, +9 \quad -4 \quad -5$$

$$18, 1, 6, 8, 4$$

$$18, 1, 6, 5, 4$$

$$-10 \quad -10 \quad -10 \quad -10$$

$$40 \quad \text{వర్షము}$$

$$10 + 10 = 20 \quad \text{రాష్ట్రము}$$

$$x, x+2, x+4, x+6, x+8$$

$$2 \quad 2 \quad 2 \quad 2 \quad 2$$

$$\text{సమస్తికొల గుణమ్ములు}$$

$$\text{సరాసారి} = x + 4 = 11$$

$$x = 7$$

$$8\text{ఖండములు}, x+4, x+6, x+8$$

$$\text{సరాసారి} = x+6 = 7+6 \Rightarrow \textcircled{13}$$

$$\textcircled{10} \quad \frac{a+b+c}{3} = m$$

$$a+b+c = 3m$$

$$\text{ఒకుపై వర్షము వర్షము చేయగా,}$$

$$(a+b+c)^2 = 9m^2$$

$$a^2 + b^2 + c^2 + 2(ab + bc + ca) = 9m^2$$

$$a^2 + b^2 + c^2 = 9m^2$$

$$a^2, b^2, c^2 \text{ ల సరాసారి}$$

$$\text{సరాసారి} = \frac{a^2 + b^2 + c^2}{3} = \frac{9m^2}{3} = 3m^2$$

$$\textcircled{11} \quad \text{అంతిమ తావుము కేఫినా వూర్చానమ్ములు}$$

$$\underbrace{11, 22, 33, 44, 55, 66, 77, 88, 99}_{|| \quad || \quad || \quad || \quad || \quad || \quad || \quad ||}$$

$$\text{సరాసారి} = 55$$

$$\textcircled{12} \quad n = 50$$

$$\text{గుణమ్ముల సమాంగు} = \frac{n+1}{2} = \frac{50+1}{2} = 25.5$$

$$\textcircled{13} \quad 1^2, 2^2, 3^2, \dots, 7^2 \text{ ల సమాంగు}$$

$$\text{సహాయముల వర్షముల సమాంగు}$$

$$= \frac{(n+1)(2n+1)}{6} = \frac{(7+1)(2 \times 7+1)}{6} = \frac{8 \times 15}{6} = 20$$

$$\textcircled{14} \quad 100 \text{ వర్షముల చేపినమ్ములు} = 1, 3, 5, \dots, 99$$

$$\text{భర్తిమ్ములు} = \frac{\text{చెవచమ్ము} - \text{బిలాసమీ}}{\text{తేదీ}} + 1$$

$$= \frac{99-1}{2} + 1 = 50$$

$$n = 50$$

$$\textcircled{15} \quad \text{వరుసచేపినమ్ములు} = \underbrace{5, 7, 9, 11, 13, 15}_{+2 \quad +2 \quad +2 \quad +2 \quad +2}$$

$$\text{వరుసచేపినమ్ములు} = \underbrace{a, b, c, d, e}_{+2 \quad +2 \quad +2 \quad +2}$$

$$a, a+2, a+4, a+6, a+8$$

$$\text{సరాసారి} = a+4$$

SO, Answer Note

16)  $\frac{\text{వ్ಯాప్తి}}{x}$

$$\frac{\text{వర్షం}}{x^2}$$

$$\frac{\text{సరణి}}{x+x^2}$$

$$\frac{x+x^2}{2} = 5xx$$

$$\frac{x(1+x)}{2} = 5x$$

$$1+x=10, \quad x=9$$

17)

7 వరుసనంక్యాల సరణి = 20

$a-3, a-2, a-1, \textcircled{a} a+1, a+2, a+3$

$$\text{సరణి } a = 20$$

$$\text{దశమిసంక్యా} = a+3 = 20+3 \Rightarrow 23$$

18)

కెవ్వు

$(a-4), a-2, \textcircled{a}, a+2, a+4$

చెందినంక్యా

గట్టు

$a+4$

$T-x$

$x-s$

$$\begin{aligned} \text{తేదీ} &= (a+4) - (a-4) \\ &= a+4 - a+4 \\ &= 8 \end{aligned}$$

$$19) \quad \text{3 వరుసశీలంక్యాలు} = \textcircled{a-2}, a, \textcircled{a+2}$$

$$\begin{aligned} \text{మొత్తం} &= a+2 + a + a+2 \\ &= 3a \\ &= 2a = 38 \Rightarrow a = 19 \end{aligned}$$

$$\text{ముందుసంక్యా} = a-2 = 19-2 = 17$$

$$20) \quad \text{సరణి} = \frac{n_1 x_1 + n_2 x_2 + \dots}{n_1 + n_2 + \dots}$$

$$\left. \begin{array}{l} \text{మంగ} \quad n_1 = ? \quad \text{పూర్వి} \quad n_2 = ? \\ \text{వయస} \quad x_1 = 16, \quad x_2 = 15 \end{array} \right\} \quad \text{Cannot determine.}$$

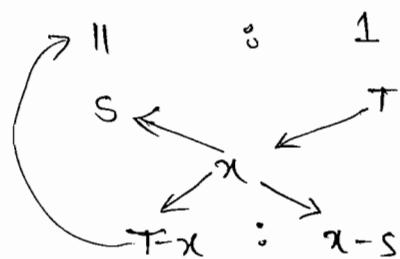
$$21) \quad \text{సగటు} = \frac{n_1 x_1 + n_2 x_2}{n_1 + n_2}$$

ప్రయసాయం	లిగెంజ్‌వార్ / ఇతరప్రా
$n_1 = 11$	$n_2 = 1$
$x_1 = S$	$x_2 = T$

$$\text{సగటు} = \frac{11 \times S + 1 \times T}{11 + 1} = \frac{11S + T}{12}$$

OR

ప్రయసాయం : లిగెంజ్‌వార్



$$\begin{aligned} \frac{T-x}{x-s} \times \frac{11}{1} &\Rightarrow Tx = 11x - 11s \\ &= 12s = 11ST \\ &x = \frac{11ST}{12} \end{aligned}$$

22)

Grandparent

$\textcircled{1}^{n_1}$

67 సంఖ్య

$x_1$

parent

$\textcircled{2}^{n_2}$

35 సంఖ్య

$x_2$

Grandchild

$\textcircled{3}^{n_3}$

6 సంఖ్య

$x_3$

$$\text{సరణి} = \frac{n_1 x_1 + n_2 x_2 + n_3 x_3}{n_1 + n_2 + n_3}$$

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

$$= \frac{134 + 70 + 18}{7} = \frac{222}{7} = 31 \frac{5}{7}$$

23)

30 దానిలు

సప్పివారిలు 1

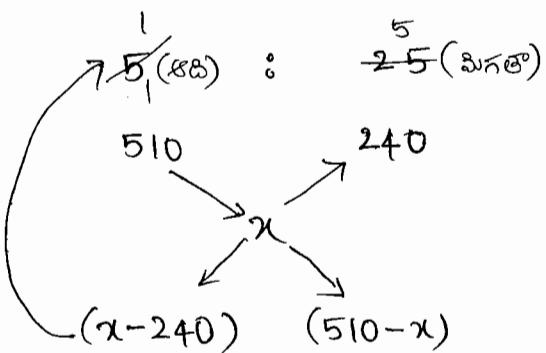
$4^{\text{th}}, 8^{\text{th}}, 15^{\text{th}}, 22, 29^{\text{th}}$

5 Sundays

విగెంజ్‌వార్లు

25 Other Days

OR



$$\frac{x-240}{510-x} \times \frac{1}{5}$$

$$5x - 1200 = 510 - x$$

$$6x = 1710$$

$$x = \frac{1710}{6} = 285$$

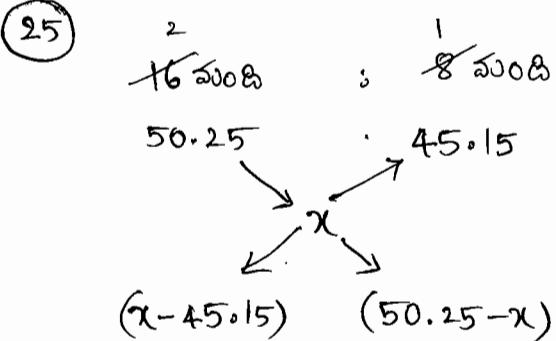
(24)  $n_1 : n_2 : n_3 = 55 : 60 : 45$   
 $\text{or } 11 : 12 : 9$

$$\text{వరాన్స} = \frac{n_1 x_1 + n_2 x_2 + n_3 x_3}{n_1 + n_2 + n_3}$$

$$= \frac{11 \times 50 + 12 \times 55 + 9 \times 60}{11 + 12 + 9}$$

$$= \frac{550 + 660 + 540}{32}$$

$$= \frac{1750}{32} = \frac{875}{16} = 54.6$$



$$\frac{x-45.15}{50.25-x} \times \frac{2}{1}$$

$$x - 45.15 = 100.5 - 2x$$

$$3x = 145.65$$

$$x = \frac{48}{\frac{145}{3}, \frac{45}{3}} = 48.55$$

(26) సరాన్స కొరీ ధీ = వెంతుంటు

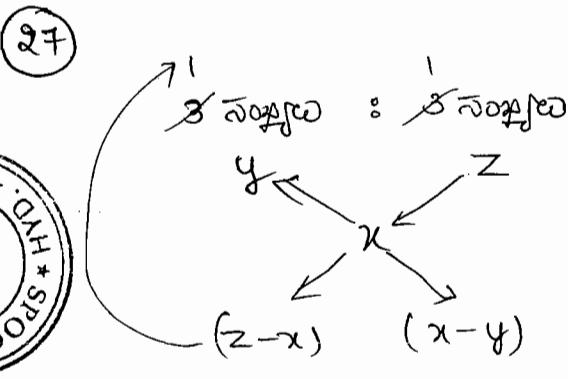
$$= \frac{3 \times 4000}{\frac{4000}{7} + \frac{4000}{7.5} + \frac{4000}{8.5}}$$

$$= \frac{3 \times 7 \times 7.5 \times 8.5}{7.5 \times 8.5 + 7 \times 8.5 + 7 \times 7.5}$$

లేట్ రైస్ కొరీ = వెంతుంచున్ని

నీటి లోపి కుర

$$= \frac{4000 \text{ Rs}}{7 \text{ Rs/ltr}}$$



$$\frac{z-x}{x-y} \times \frac{1}{1}$$

$$z-x = x-y$$

$$2x = y+z$$

(28) 9 వుండి సరాన్స అట్టు  $x \text{ Rs}$  ఉన్నామ.

$n_1$	8 వుండి	$n_2$
$x_1$	30 Rs	$(x+20)$ Rs $n_2$

$$\text{వరాన్స} = \frac{n_1 x_1 + n_2 x_2}{n_1 + n_2}$$

$$x = \frac{8 \times 30 + 1 \times (x+20)}{8+1}$$

$$9x = 240 + x + 20$$

$$8x = 260$$

$$x = \frac{260}{82}$$

వసన్థార్థి  $x = 32.5$

పెట్టుట్టు =  $32.5 \times 9$   
 $= 292.50$

29)  $50$  స్కూల్ స్కాస్ =  $30$

తొత్తినట్టును  $30$  లుస్తానువు.



పెట్టు లోస్ =  $10 + 5 = 15$

'15' Lobs  $48$  నండి సమాసగే వచ్చుటాయి.

$$= \frac{-15}{48} = -0.312$$

$$\text{శైత్రస్కాస్} = \frac{30}{-0.312} = 29.688$$

30)  $5$  స్కూల్ స్కాస్ =  $27$

తొత్తినట్టును  $27$  లుస్తానువు.

$$27, 27, 27, 27, 27$$

$$-2 \quad -2 \quad -2 \quad -2$$

$$\begin{array}{r} 27 \\ + 8 \\ \hline 35 \end{array}$$

31)  $35$  వుంది ( $16$  సీ.ఎస్.)

$$21 \text{ వుంది}$$

$$14 \text{ వుంది}$$

?

$$\begin{array}{c} 3 : 2 \\ 21 \text{ వుంది} : 14 \text{ వుంది} \\ 14 \leftarrow \begin{array}{l} \swarrow \\ 16 \end{array} \begin{array}{l} \searrow \\ x \end{array} \\ x-16 \quad 2 \end{array}$$

$$\frac{x-16}{2} = \frac{3}{2}$$

$$x = 16 + 3 = 19$$

(32)

A

B

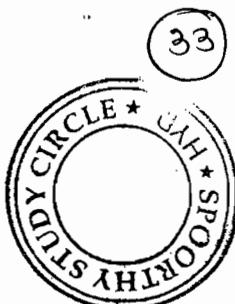
$$10 \text{ వుంది} : \frac{3}{6} \text{ వుంది}$$

$$\begin{array}{ccc} 75\% & & x\% \\ \swarrow & & \searrow \\ (x-76) & & 1 \\ \downarrow & & \downarrow \\ \frac{x-76}{1} \times \frac{5}{3} & & \end{array}$$

$$3x - 228 = 5$$

$$3x = 233$$

$$x = \frac{233}{3} = 77 \frac{2}{3}\%$$



(33)

$$\begin{array}{ccccc} 3 & & 2 & & \\ \swarrow & & \searrow & & \\ 6 \text{ matches} & & 4 \text{ matches} & & \\ \uparrow & & \uparrow & & \\ 42 \text{ Runs} & & x \text{ Runs} & & \\ \downarrow & & \downarrow & & \\ 38.9 \text{ Runs} & & 3.1 & & \\ \downarrow & & \downarrow & & \\ (38.9 - x) & & & & \end{array}$$

$$\frac{38.9 - x}{3.1} \times \frac{3}{2}$$

$$77.8 - 2x = 9.3$$

$$2x = 68.5$$

$$x = 34.25$$

(34)

$$6 \text{ స్కూల్ } (3.95)$$

$n_1$	$n_2$	$n_3$
2 స్కూల్	2 స్కూల్	2 స్కూల్
3.4	3.85	$x$
$x_1$	$x_2$	$x_3$

$$\text{స్కాస్} = \frac{n_1 x_1 + n_2 x_2 + n_3 x_3}{n_1 + n_2 + n_3}$$



40) 50% వరువు 282 వరువుల కేంద్రాల

$$\text{RunRate} = \frac{\text{వరువు}}{\text{overs}} = \frac{282}{50} = 5.64$$

$\nearrow 10 \text{ overs} : \nearrow 40 \text{ overs}$

3.2 Runrate  $\rightarrow$  Runrate  
 $\downarrow$   $5.64 \text{ RR}$   $\downarrow$

$(x - 5.64) : 2.44$

$$\frac{x - 5.64}{2.44} = \frac{1}{4}$$
 $x - 5.64 = 0.61$ 
 $x = 6.25$

41)  $3x \quad 5x \quad 7x$

సగటు =  $\frac{\text{రాష్ట్రముతో}}{\text{అంతర్జాల సాధు}}$

$$\frac{3000}{15000} = \frac{1x}{5x}$$
 $x = 3000$

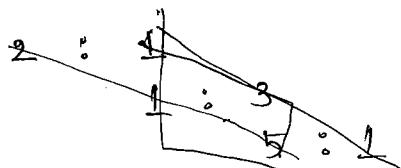
Cheap =  $3x \Rightarrow 3 \times 3000 = 9000$

42)  $a, b, c, d$

$a:b = 2:1$

$b:c = \left(\frac{1}{2} \times 1\right) \times 3 = 1:3$

$c:d = 5:1$



$a:b:c:d = 10:5:15:3$

సగటు =  $\frac{a+b+c+d}{4} = 24.75$

$a+b+c+d = 99$

$$\overline{18.75} = \frac{15}{33} \times 99 = 45$$

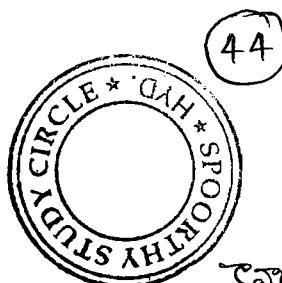
43)  $a, b, c, d,$

$$\text{సగటు} = \frac{a+b+c+d}{4} = 60$$
 $a = \frac{b+c+d}{4}$ 
 $b+c+d = 4a$

$$\frac{a+4a}{4} = 60$$

$$a+4a = 240$$
 $5a = 240$

$$a = 48.$$



44)

$$\frac{a:b}{b:c} = \frac{2:4}{4:1}$$
 $a:b:c = 4:8:1$

టెలుగు సంస్కరణ =  $4x, 2x, 1x - 6.50$

విలువు =  $\frac{1}{4x}, \frac{1}{2x}, \frac{1}{x}$

$$\text{సగటు} = \frac{\frac{1}{4x} + \frac{1}{2x} + \frac{1}{x}}{3} = \frac{7}{24x}$$

$$\frac{1+2+4}{4x} = \frac{7}{24x}$$

$$x = 6$$

$4x$	$2x$	$1x$
$4 \times 6$	$2 \times 6$	$1 \times 6$
24	12	6

45)  $a, b, c$  అయి.

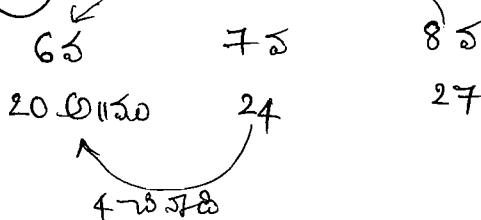
$$(a+b \text{ సగట}) - (b+c \text{ సగట}) = 15$$

$$\left( \frac{a+b}{2} \right) - \left( \frac{b+c}{2} \right) = 15$$

$$a+b - b - c = 30$$

$$a - c = 30$$

46) రెండు వైపులా సమానంగా ఉన్నాయి.



$$6v \quad 7v \quad 8v$$

$$(x-7) \quad (x-3) \quad x \text{ మిమో.}$$

$$\begin{array}{cccccc} 2 \text{ సంఖ్య } & 3 \text{ సంఖ్య } & 6v & 7v & 8v \\ 15.5 & \frac{64}{3} & x-7 & x-3 & x \end{array}$$

$$\frac{15.5 \times 2 + \frac{64}{3} \times 8 + x-7 + x-3 + x}{8} = 20$$

$$31 + 64 + 3x = 160$$

$$3x + 85 = 160$$

$$3x = 75$$

$$x = 25$$

47) తుతీసంఖ్య విద్రులా నేడు సంఖ్య రాలిపెట్టి

సరాసరి కూడా లీఫ్ సంఖ్యకు కొఱువుట్టి. 75

సంఖ్యల సరాసరి 35. తుతీసంఖ్య 5 కాపిటీ

వచ్చి ఇత్తు సరాసరి = పొత్తు సరాసరి + 5

$$= 35 + 5 \Rightarrow 40$$

48) తుతీసంఖ్య శీర్ష సంఖ్యకు గుణిస్తే  
సరాసరి కూడా లీఫ్ సంఖ్యకు గుణిస్తే.  
10 సంఖ్యల సరాసరి 7. తుతీసంఖ్యను.

12 తో సహిస్రి వచ్చి ఇత్తు సరాసరి = పొత్తు సరాసరి X

$$12 = 7 \times 12 = 84$$

49) తుతీసంఖ్యని x సత్తంపెటింటి సరాసరి కూడా x సత్తంపెరుగుతుంది. తుతీసంఖ్యను 10% పెట్టి సరాసరి కూడా 10% లభ్యించాలి.

50)

$$\begin{array}{ccc} \text{సరిసం} & \text{తప్పి} & \text{పొత్తు సింహితెడ} \\ \text{సం} & - & = \\ 48 & - 23 & = 25 \end{array}$$

$$\text{రాఫ్టి} = 25 \text{ కు } 50 \text{ మిమో సరాసరి కొఱువు} = \frac{25}{50} = \frac{1}{2} = 0.5$$

$$\text{ఇత్తు సరాసరి} = 36 + 0.5 = 36.5$$

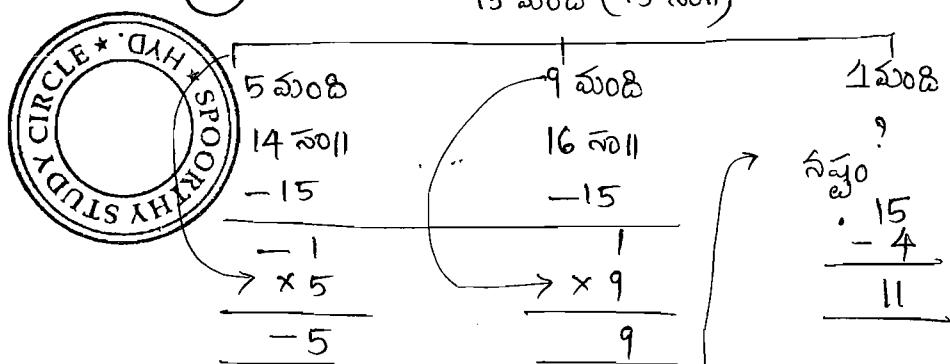
$$\begin{array}{ccc} \text{సరిసం} & \text{తప్పి} & = \text{పొత్తు సింహితెడ} \\ \text{సం} & - & = \\ 63 & - 83 & = 20 \end{array}$$

$$\frac{20 \text{ (తప్పి)}}{x \text{ మిమో}} \times \frac{1}{2} \text{ (సాసంతెడ)}$$

$$x = 40$$

52)

15 మిమో (15 సాసంతెడ)



$$\text{Overall} = -5 + 9 = 4$$

OR

$$\text{సరాసరి} = \frac{n_1 x_1 + n_2 x_2 + n_3 x_3}{n_1 + n_2 + n_3}$$

$$= \frac{5 \times 14 + 9 \times 16 + 1 \times x}{5 + 9 + 1}$$

=

$$53) x_1, x_2, x_3, \dots, (x_6), \dots, x_{11}$$

$$= \frac{x_1 + x_2 + x_3 + \dots + x_{11}}{11} = 10.9$$

$$= x_1 + x_2 + x_3 + \dots + x_{11} = 10.9 \times 11 \\ = 11.99 \rightarrow ①$$

$$\frac{x_1 + x_2 + \dots + x_6}{6} = 10.5$$

$$x_1 + x_2 + \dots + x_6 = 10.5 \times 6 = 63 \rightarrow ②$$

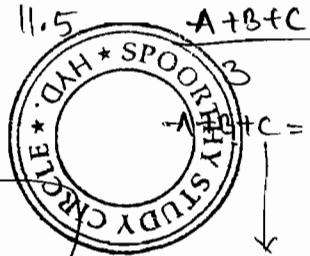
$$\frac{x_6 + \dots + x_{11}}{6} = 11.4 =$$

$$x_6 + \dots + x_{11} = 11.4 \times 6 = 68.4 \rightarrow ③$$

$$② + ③ = x_1 + x_2 + \dots + x_6 + x_6 + \dots + x_{11} = 131.5$$

$$① = x_1 + x_2 + \dots + x_6 - (x_6 + \dots + x_{11}) =$$

$$x_6 =$$



OR

$$10.9$$

$$11.4$$

$$10.5$$

$$x_1, x_2, \dots, (x_6), x_7, \dots, x_{11}$$

$$\begin{array}{r} 10.5 \\ - 10.9 \\ \hline - 0.4 \\ \rightarrow x_6 \\ \hline - 2.4 \end{array}$$

$$\begin{array}{r} 11.4 \\ - 10.9 \\ \hline 0.5 \\ \times 6 \\ \hline 3.0 \end{array}$$

$$\text{Overall} = 0.6$$

$$x_6 = 10.9 + 0.6 = 11.5$$

54)

$$\frac{A+B+C}{3} = 54 \frac{1}{3}, \quad \frac{B+C+D}{3} = 53,$$

$$\frac{A+B+C+D+E}{5} = ?$$

This Question Data Insufficient

$$55) \quad \begin{matrix} 1^{\text{st}} & 2^{\text{nd}} & 3^{\text{rd}} & 4^{\text{th}} & 5^{\text{th}} \\ a & b & c & d & e \end{matrix}$$

$$\frac{a+b+c+d}{4} = 58 \quad \left| \frac{b+c+d+e}{4} = 60 \right.$$

$$\left( \begin{matrix} 2) & b+c+d+e = 240 \\ 1) & a+b+c+d = 232 \end{matrix} \right) \quad \underline{c-a=8}$$

$$1^{\text{st}} 8^{\text{th}} 20 \quad 5^{\text{th}} 20$$

$$a : e = 7 : 8 \quad \text{or} \quad 1$$

$$1 \longrightarrow 8^{\circ}$$

$$55) \quad 8 \longrightarrow ? = \frac{8 \times 8}{1} = 64^{\circ}$$

56)

$$\begin{array}{l} A+B+C = 45 \\ A+B+C = 135 \\ \hline A+B = 40 \\ A+B = 80 \\ \hline A = 80 - B \\ \frac{A+C}{2} = 43 \\ A+C = 86 \\ B+C = 86 \\ C = 86 - B \end{array}$$

$$80 - B + B + 86 - B = 135$$

$$B = 166 - 135$$

$$B = 31$$

57)

$$P+Q = 2 \times 5050$$

$$Q+R = 2 \times 6250 = 12500$$

$$R+P = 2 \times 5200$$

$$2(P+Q+R) = 2(5050 + 6250 + 5200)$$

$$P+(Q+R) = 16500$$

$$P+12500 = 16500$$

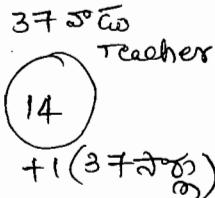
$$P = 16500 - 12500$$

$$P = 4000$$

58

(36 మంది)

$$14, 14, 14 \dots 14 \dots \\ +1 +1 +1 +1$$



$$\text{కేవలం} = 14 = 14$$

$$\text{పొదంకీకావాల్స} = 1 \times 37 = 37$$

51

59

1500, 1500, 1500, ... 1500  
+100 +100 +100 +100  
(20 మంది)

manager  
21 వాడు

$$\text{కేవలం} = 1500 \Rightarrow 1500$$

$$\text{పొదంకీకావాల్స} = 100 \times 21 = 2100$$

3600

$$400 \text{ grms} = \frac{400}{1000} = 0.4 \text{ kgs.}$$

35, 35, 35, ... 35, ...  
+0.4 +0.4 0.4  
(24 మంది)

35  
+0.4  
(25 సాధ్య)  
చెంచడ  
25 వ

$$\text{కేవలం} = 35$$

$$\text{పొదం} 0.4 \times 25 = 10$$

45

$$7\text{ మంది} + 6 \text{ గుణ పిల్లల} = 7 \text{ మంది}$$

12, 12, 12, 12, 12, 12  
-5 -5 -5 -5 -5 -5

తలు 12

$$\text{తలు} = 12$$

$$6 \times 5 = \frac{30}{42}$$



62

11 మంది (సగటు వయస్సు కి లింగా)

9 మంది

Captain = 26

సగటు (x-1)

Wicket keeper = 29

రాసులముత్తు = రాసులముత్తు

$$11x = 9(x-1) + 26 + 29$$

$$11x = 9x - 9 + 55$$

$$2x = 46$$

$$x = 23$$

63

$$1.4, 1.4, 1.4, 1.4, \dots 14 (25 \text{ మంది})$$

$$5 \text{ మంది పెళ్ళిపురుషు} = 1.4 \times 5 = 7 \text{ mtrs}$$

$$\text{పిగ్గతి} 20 \text{ మంది} \times 0.15 \text{ m ఎత్తు} = 20 \times 0.15 = 3 \text{ m}$$

$$5 \text{ మంది అసల ఎత్తు} = 7 - 3 = 4 \text{ m}$$

$$\text{సగటు} = \frac{4 \text{ m}}{5} = 0.8 \text{ mtrs.}$$

64

65 బయటే వేళ్ళ 65 వాడు లోపల్చివేసి నిర్మించాలి.

శిత్త వ్ర్యక్తి వల్ల నిర్మాణి = 2.5 మిలియన్.

మందికి కొట్టు 2.5 వాడు శిత్త వాడు తీసులలో వుట.

$$\text{కేవలం} = 65$$

$$\rightarrow \frac{8 \times 2.5 = 20}{85}$$

65

$$52, 52, 52, \dots 52 (45 \text{ మంది})$$

5 మంది సగటు వయస్సు 48 తో ఒకసంఖ్య వేళ్ళ, మరొక 5 మంది 48 తో వేళ్ళ స్థాని మార్చడు.

$$48 \text{ తో } 54 \text{ తో } 54 - 48 = 6$$

$$5 \text{ మంది మీద వ్యక్తి లూఫ్టు} = 5 \times 6 = 30$$

$$30 \text{ లూఫ్టు } 45 \text{ మంది పాచుండి} = \frac{30}{45} = \frac{2}{3}$$

$$\text{శిత్త స్థాని} = 52 + \frac{2}{3} = 52\frac{2}{3}$$



$$73 \quad \frac{h+w}{2} = 23$$

$$\text{పొత్త} - h + w = 46$$

$$5 \text{ సా॥ తర్వాత పెట్ట} = 46 + 10 = 56$$

$$\text{పెట్ట} 100 = 56 + 1 = 57$$

$$\text{సగటు} = \frac{57}{3} = 19 \text{ yrs.}$$

74

$$3 \text{ సా॥ త్రీత్త} = \frac{A+B}{2} = 18$$

$$A + B = 36$$

$$\text{అస్తుత్త} - A + B = 36 + 6 = 42$$

$$\text{అస్తుత్త సగటు} = \frac{A+B+C}{3} = 22$$

$$= \frac{42+C}{3} = 22$$

$$= 42 + C = 66$$

$$C = 24 \text{ yrs.}$$

75

3 సా॥ త్రీత్త

$$\frac{h+w+s}{3} = 27$$

$$h+w+s = 81$$

$$+3 +3 +3$$

అస్తుత్త

$$h + w + s + 8 + 9 = 90$$

$$h + 50 = 90$$

$$h = 40$$

5 సా॥ త్రీత్త

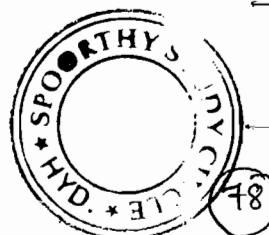
$$\frac{w+s}{2} = 20$$

$$w+s = 40$$

$$+5 +5$$

అస్తుత్త ము

$$w+s = 40 + 10 = 50$$



78

ఇందులోకినండించుటం = 17

$$\text{మిగతామండుతున్న రూపును} = 15$$

2 yrs

77

10 సా॥ త్రీత్త + గురు సభ్యులు

$$24, \quad 24, \quad 24, \quad 24 \\ +10 \quad +10 \quad +10 \quad +10$$

24  
C<sub>1</sub>

24  
C<sub>2</sub>

అన్నితము ----

$$\text{ఇశ్టశిక్ష కెన్సా} = 48$$

$$\text{ప్రమాణసభ్యుల రూపును} = -40$$

$$\text{వాయధి వయస్} = 8$$

$$C_1 + C_2 = 8$$

$$C_1 - C_2 = 2$$

$$2C_1 = 10^5$$

$$C_1 = 5$$

$$C_1 + C_2 = 8$$

$$5 + C_2 = 8$$

$$C_2 = 8 - 5$$

$$C_2 = 3$$

$$3 \text{ సా॥ త్రీత్త} 5 \text{ మంచి సగటు} = x \text{ yrs (అంశ)}$$

$$\text{అస్తుత్త} + 3 + 3 + 3 + 3 + 3 + 3$$

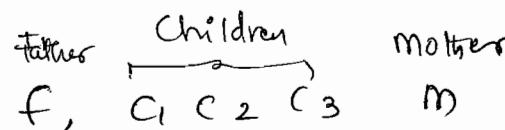
$$\text{పొత్తభ్యుల వయస్} = x \leftarrow$$

$$-28 \text{ రూపు} + 3 \times 5 \text{ రూపు} = -15$$

$$x = 15$$

$$\text{ఇశ్ట సభ్యుల వయస్} = x - 15 \leftarrow$$

79



$$① \frac{C_1 + C_2 + f + C_3}{3} = 20\% \left( \frac{f + C_1}{2} \right)$$

$$② m + C_3 = 29$$

$$③ f = 39$$

$$④ C_2 = ? \quad \left. \begin{array}{l} \times \\ \text{we cannot} \\ \text{determine} \end{array} \right.$$

76

3 సా॥ 5 గురు సభ్యులను ఉండును

17, 17, 17, 17, 17 17  
చింది

అస్తుత్త + 3 + 3 + 3 + 3 + 3

80

వెదుట్టినవారు

క్రతవారు

$$\begin{array}{ccc}
 \text{X మంధి} & : & 20 \text{ మంధి} \\
 16 \text{ సంఖీ} & \xrightarrow{\quad} & 15 \text{ సంఖీ} \\
 & \downarrow & \downarrow \\
 0.95 & : & 0.95 \\
 1 & : & 1 \\
 \frac{1}{1} \cancel{\times} \frac{x}{20} & \Rightarrow & x = 20
 \end{array}$$

81

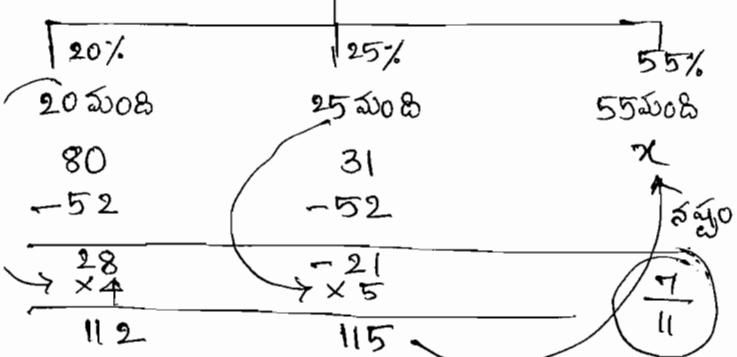
$$\begin{array}{ccc}
 \text{ప్రయాచిల} & : & \text{ప్రైమీల} \\
 3 \text{ లో} & \xrightarrow{\quad} & 2 \text{ లో} \\
 x+5 & \xrightarrow{\quad} & x \rightarrow (\text{రూప్ రూప్}) \\
 & \downarrow & \downarrow \\
 25.5 & : & 25.5 \\
 (25.5-x) & : & x-20.5
 \end{array}$$

$$\begin{aligned}
 \frac{25.5-x}{x-20.5} & \cancel{\times} \frac{3}{2} \\
 51 - 2x & = 3x - 61.5 \\
 5x & = 112.5 \\
 x & = \frac{112.5}{5} = 22.5
 \end{aligned}$$

$$\text{ప్రైమీ} = x = 22.5$$

$$\text{రూప్} = x+5 = 22.5 + 5 = 27.5$$

82

100 మంధి  $\xrightarrow{\text{వెగుట}} 52$ Overall = 7  $\rightarrow$  లాభం

$$\begin{aligned}
 &= 52 - \frac{7}{11} \\
 &= 52 - 7(0.09) \\
 &= 52 - 0.63 \\
 &= 51.37.
 \end{aligned}$$

83

1 మంధి : x మంధి

టక్కిసియన్స్ : విగతారు

12,000 : 6,000

8000 : 4000

2000 : 4000

1 : 2

$$\frac{1}{2} \cancel{\times} \frac{1}{x} \Rightarrow x = 14$$

$$\text{మొత్తమంధి} = 7 + 14 = 21$$

84

చాలాలు

చూడాలు

11 సంఖీ

11 సంఖీ క్రమాలు

3 : 1

$$\text{చాలా} = \frac{3}{4} \times 600 = 450$$

$$\text{చూడా} = \frac{1}{4} \times 600 = 150$$

85

పరీక్షలలు - పూర్తిగా subjects/papers

స్కూల్ అనుభసమా.

$$\text{పరావర్తి} = \frac{\text{శ. ప్రిం}}{\text{శ. సం}}$$

$$63 = \frac{20 \cdot 3x}{x}$$

$$20 \cdot 3x = 63x$$

$$\text{క్రితంశను} = \frac{63x + 20 + 2}{x} = 65$$

$$= 63x + 20 + 2 = 65x$$

$$= 22 = 2x$$

$$2x = 22$$

$$x = 11$$

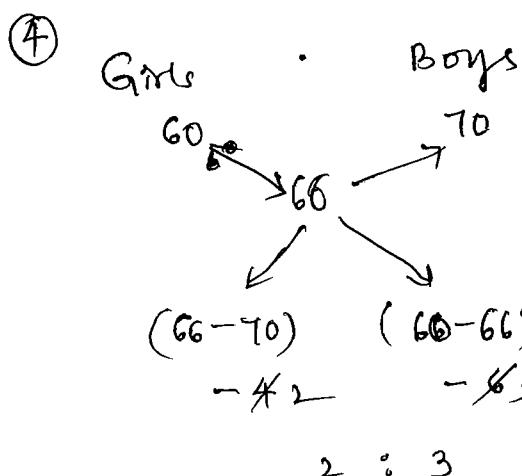
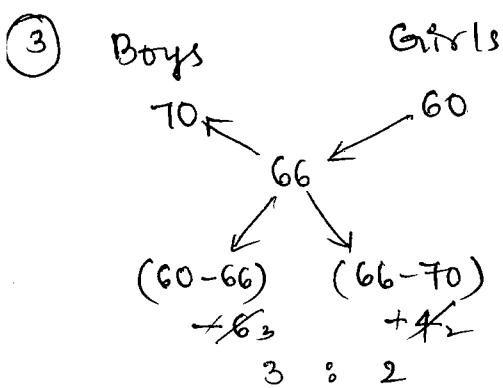
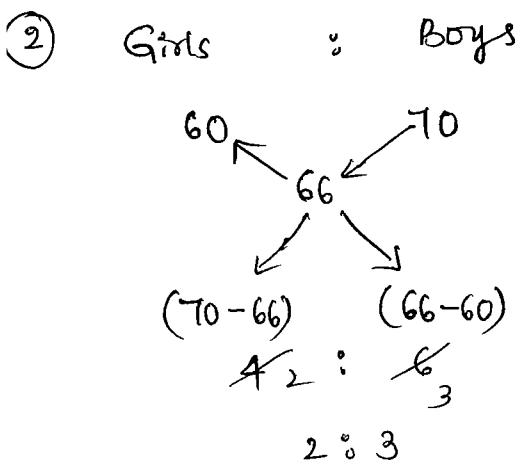
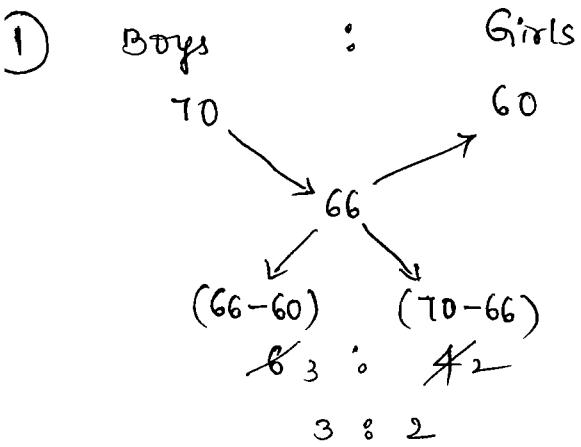
(86)

వ్యాప : వ్యాపి

$$\begin{array}{ccc} 16 \cdot 4 & & 15 \cdot 4 \\ \searrow & & \swarrow \\ & 15 \cdot 8 & \\ \swarrow & & \searrow \\ 0 \cdot 4 & : & 0 \cdot 6 \\ 2 & : & 3 \end{array}$$



# ALLEGATION



\* ఈ Questionని ప్రాథమికంగా చెందుకుయి.

## Rules:

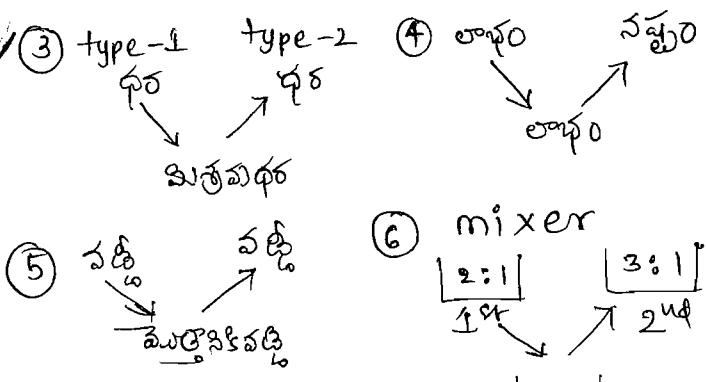
\* Allegation లో కొన్నామరికి క్రిందికి దీనిలో తీండ్రమణి క్రిందికి రెండు అంశాలు క్రిందికి దీనిలో.

\* ఒకవేడ్లునా ఐష్టాసామ్రి - ఐష్టాసామ్రి క్రింది లాగే మనం రాశ్చోవాలి. వస్తే తెలుగు అంశాల లేదా రెండు అంశాల వస్తోయి.

\* Allegation ను ఎక్కడ వాడుతామణి క్రింది అనిపథం Question లో క్రింది మనం Allegation method ను వాడుకోవచ్చు.

\* మధ్యమ కోసం నామ్మి ఒక్కటి వైపు క్రిందింటి సౌభాగ్యమాత్రమే దీనిలంది. ఎల్లవేడ్లునా, తథ్యమ దీనిలు, ఎల్లాం దీనిలు.

\* ① Boys      Girls      ② See-A      Sec-B  
↓                  ↓                  ↓                  ↓  
Class              Class              See-A              Sec-B



\* ప్రస్తుత లాగు సంచాలిలో మనం Allegation method కిందించినప్పుడు.

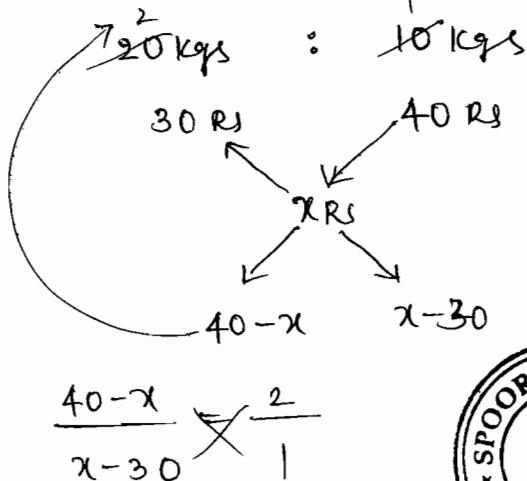
\* హాయిది / బాబు / ఎత్తు / థర్ర / వట్టి / లాఫ్టో / వట్టి / మింగ్ / స్టాప్ / పోవాలు / మండి / లైట్

ఇలా ఏలండ్రి వాడ్కునా Allegation  
కిందించినప్పుడు.

Q1) 30 RS/kg 20 కిలో బిల్బున్ని, 40 RS/kg  
10 కిలో బిల్బుంతో కలపినా ఏవైడు మిశ్రమం

ఎందుకి నొసాంధి థర ఎంత?

Sol: Allegation ను థరకి Apply చేస్తామో.



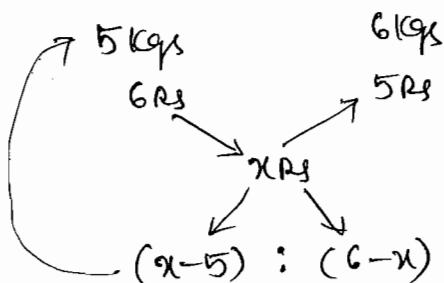
$$3x = 100$$

$$x = \frac{100}{3} = 33.33 \text{ or } 33\frac{1}{3}.$$



Q2) 5 కిలో 6 RS/kg బిల్బున్ని, 5 RS/kg  
6 కిలో బిల్బుంతో కలపి, ఈ మిశ్రమంలో 10%  
రాఫం రావలంచి పెత్తమంటా నొసాంధి థర  
ఎంత?

-Allegation థరకి Apply చేస్తామో.



$$\frac{x-5}{6-x} \times \frac{5}{6}$$

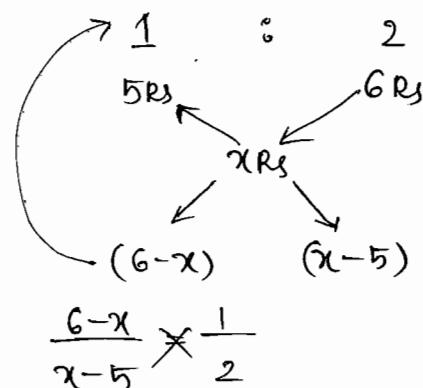
$$6x - 30 = 30 - 5x$$

$$11x = 60$$

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

$$\begin{aligned} \text{అసలు ఫట} &= \frac{60}{11} \\ \text{అవ్వడు ఫట} &= 110\% \frac{60}{11} \\ &= \frac{110}{100} \times \frac{60}{11} \\ &= 6 \text{ RS} \end{aligned}$$

Q3) 5 RS/kg, 6 RS/kg గల రెండు రూల నుక్కుసు  
1:2 ల్స్ట్రుట్లి కలపితే పెత్తమంటా నొసాంధి  
థర ఎంత?



$$12 - 2x = x - 5$$

$$3x = 17 \Rightarrow x = \frac{17}{3} = 5.66$$

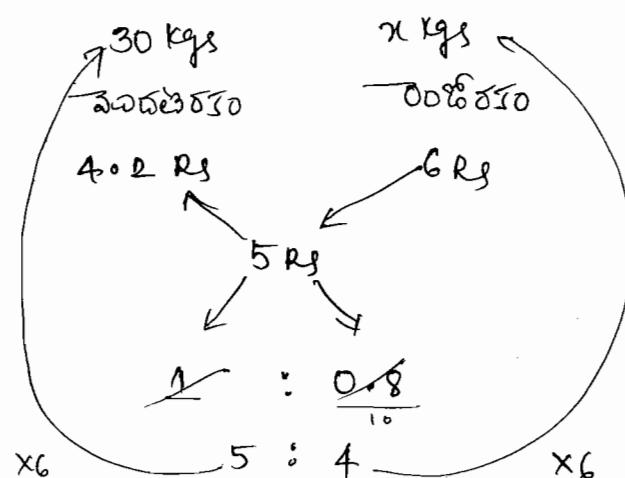
Q4) 4.2 RS/kg 30 కిలో బిల్బున్ని 6 RS/kg

రెండు రూలు 10 ల్స్ట్రుట్లి కలపితే ఈ మిశ్రమంలో 40%  
రాఫం రావలంచి పెత్తమంటా నొసాంధి థర  
ఎంత?

40% రాఫాన్స్

140%  $\rightarrow 7$  RS

$$100\% \rightarrow ? \quad \frac{100 \times ?}{140} = 5 \text{ RS} \quad \boxed{\text{థర}} \quad \boxed{\text{మిశ్రమం ప్రస్తుతి}}$$



$$50, 5 \rightarrow 30$$

$$4 \rightarrow 1 = \frac{4 \times 30}{5}$$

$$= 24 \text{ RS/kg}$$

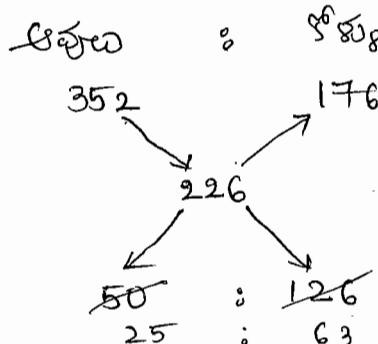
శింగాలు కొన్ని ప్రమాదాలకు విషయంగా ఉన్నారు. ఇంద్రాజిత్ రావు నుండి ఈ ప్రమాదాలకు విషయంగా సమాచారం లభించింది. అందులో కొన్ని ప్రమాదాలకు విషయంగా సమాచారం లభించింది.

Allegation 388<sup>½</sup> Apply నేనున్నామి.

88 துவ, 226 டாஸ் என்று.

మొత్తం అన్న చివరి అంశం,  $3\bar{4}0_8 = 88 \times 4 = 352$

$$11 \quad 11 \quad \$888 \quad 11 \quad 11 = 88 \times 2 = 176$$



$$\text{8 वर्ष} = \frac{25}{88} \times 88 = 25$$

$$\text{सूफ} = \frac{63}{88} \times 88 = 63$$

(७) ఈ క్రానసులకి మొత్తం 150 వుండి విచ్ఛయింద

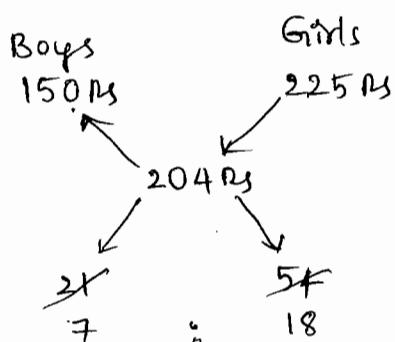
ట్లీన్సు. వరక బేధితులకు నవ్యమంగ ప్రతి చోటు  
1 B.W.P. . ప్రతి చూపుక 1.50 ఫిర్మాంగ రైస్ మెత్త 0

೨೧೪ ರಷ್ಟು ಕ್ರಿಮಿಯಲ್ಲಾಗಿ ಸಂಪರ್ಕಿಸಿ ಶಿಕ್ಷಣದಲ್ಲಿ ಚಾಲ್ತಿ

ನಂತರ ಎಂತ?

$$150 \text{ floors } \text{Boys Ward} = 150 \times 1 \text{ Ru} = 150 \text{ Ru}$$

$$150 \text{ Girls } \text{Gard} = 150 \times 1.5 \text{ Rs} = 225 \text{ Rs.}$$



$$\text{Boys} = \frac{7}{9} \times 150 = 42$$

$$\text{Girls} = \frac{18}{25} \times 150 = 108$$

(Q7) రండు వాత్రుల్లో పోటు వారియు నీటిని వ్యక్తిగతునగఁ 3:2, 7:3. ఈరెండు వాత్రుల్లో కెఱవగఁ ఏష్టిన మిశ్రవంటి పోటు నీటిని వ్యక్తి 2:1. - లియాతీ రండు వాత్రులను ఏని వ్యక్తిగతి రాలపాయి.?

$$\begin{array}{r} m : w \\ 3 : 2 \\ \hline \frac{3}{5} \end{array}$$

$$\begin{array}{r} m : \omega \\ 7 : 3 \\ \hline \frac{7}{10} \end{array}$$

$$m : \omega$$

$$\frac{2}{3} : \frac{1}{3}$$

Question 2: What does Jesus' Convert do?



$$\left(\frac{7}{10} - \frac{2}{3}\right) : \left(\frac{2}{3} - \frac{3}{5}\right)$$

$$\frac{21-20}{30} : \frac{10-9}{15} \Rightarrow \left( \frac{1}{30} : \frac{1}{15} \right) \times 30$$

$$\Rightarrow \frac{30^{\circ}1}{30^{\circ}} : \frac{30^{\circ}2}{15^{\circ}} = 1^{\circ}2$$

Q8) 60 එළු වූත්තුවයෙහි 84% පොලු දීනුය.

ఏ ప్రతమసో ఎంత నీటిని కలిగితే ప్రతమంలో వోయ  
64% లక్షుంది.?

$$\frac{3 \cdot 15}{9 \cdot 6 + n} \times \frac{1}{9}$$

$$28:35 = 9:6 = x$$

$$\kappa = 18.75$$

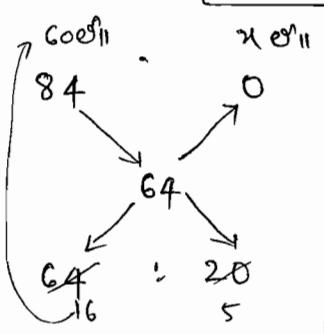
60	60
m	84%
w	16%

1st

x	6
m	0%
w	100%

2nd

m	64%
w	36%



$$16 \rightarrow 60 \\ 5 \rightarrow ? = \frac{5 \times 15}{16} \\ = \frac{75}{4} = 18.75 \\ = 18.75$$

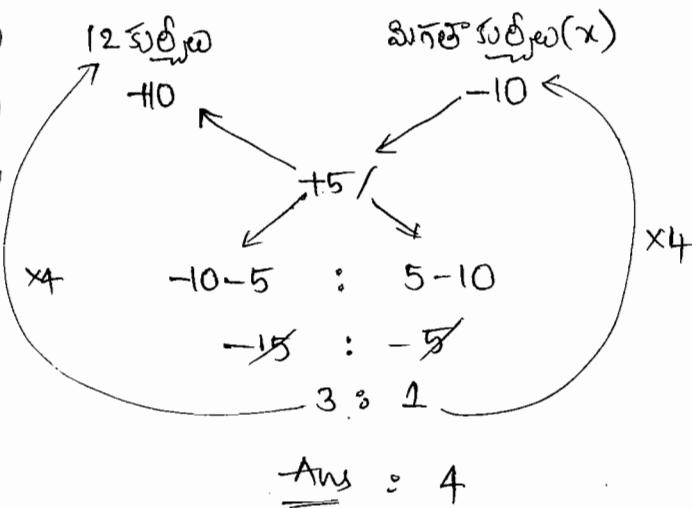
$$P = 5000 \\ 3 \text{ సెంతి శి } = 900 \text{ Rs}, 1 \text{ సెంతి శి } = \frac{900}{3} = 300 \text{ Rs} \\ \text{వట్టిశి } = 300 \text{ రూపీలు } 5000 \text{ రూపీలు \ ఎంతారు?} \\ = \frac{300}{5000} \times 100 = 6\%$$

1st	2nd	$1st = \frac{2}{5} \times 5000 = 2000$
3%	8%	$2nd = \frac{3}{5} \times 5000 = 3000$
6%	2 : 3	

Q9 ఒక వ్యక్తి తన చద్దరులో 12 రూపీలను 10% లాభానిః మిగతావటని 10% నిషాధించి లప్పినా, అతనికి మొత్తం మీద 5% లాభం వచ్చింది. 10% నిషాధించి లప్పిన రూపీలు ఏమి?

-Allegation method

$$\begin{matrix} \text{Profit రూపీ } + \\ \text{Loss రూపీ } - \end{matrix}$$



R.S. Aggarwal Book



(1)

1st	2nd
15Rs	20Rs
3 : 5	1 : 5
7 : 3	

(2)

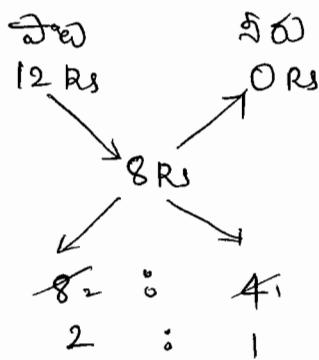
1st	2nd
7 : 2	5 : 7
6 : 2	1 : 3
2 : 3	

(3)

G 2	72
64.50	
165	2.5
3	1
	3 : 1

Q10 ఒక వడ్డి చోప్పున ఒక వ్యక్తి తన చద్దరులో 5000 రూపీలను 30త 3% వట్టికి మిగిలంది 8% వట్టికి పల్లి ఇచ్చాడు. అతనికి 3 సెంతి తర్వాత 900 రూపీలను వట్టిమొత్తంగా వచ్చింది. అతని 8% వట్టికి ఇచ్చిన సొమయ్య ఎంత?

4)



5)

$$\frac{2}{3} = \frac{15\text{Rs}}{20\text{Rs}} = \frac{(20-x)}{(x-15)}$$

$$\frac{20-x}{x-15} \times \frac{2}{3}$$

$$60 - 3x = 2x - 30$$

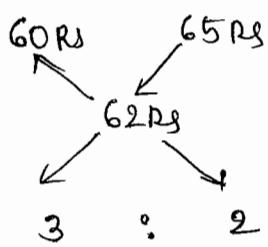
$$5x = 90$$

$$x = \frac{90}{5} = 18$$

6)

$$110\% \rightarrow 68.2$$

$$(\text{మొత్తము గంభీర}) 100\% \rightarrow ? = \frac{100 \times 68.2}{110} = 62$$



7)

63

$$\frac{271\text{kg}}{9\text{Rs}} = 271\text{kg} \quad \frac{271\text{kg}}{7\text{Rs}} = 271\text{kg}$$

$$\frac{271\text{kg}}{8.4\text{Rs}} = 271\text{kg} \quad \frac{271\text{kg}}{1.4\text{Rs}} = 271\text{kg}$$

$$\frac{271\text{kg}}{0.6} = 271\text{kg} \quad \frac{271\text{kg}}{0.4} = 271\text{kg}$$

$$7 : 3 \quad x9$$

$$3 \times 9 = 27\text{kg} \quad 7 \times 9 = 63\text{kg}$$

8)  $16\frac{2}{3}\% = \frac{1}{6} \rightarrow \text{వీరు}$   $\frac{1}{6} \rightarrow \text{పాటు}$  పాటు : వీరు = 6 : 1

$$\text{వింతశతం నీటియిరులపాటు} = \frac{\text{వీరు}}{\text{పాటు}} \times 100$$

Ans : 1 : 6  
As per Book

$$= \frac{1}{7} \times 100 = 14.28\%$$

9)

$$25\% = \frac{1}{4} \rightarrow \text{వీరు}$$

$$\text{నీటిశతం} = \frac{1}{5} \times 100 = 20\%$$

10)

S : W
8 : 5
8    5
13    13

S : W
5 : 2
5    2
7    7



S : W
8 : 5
8    5
13    13

wrong question

Q: A = 5 : 2, B = 7 : 6, C = 8 : 5

S : W
5 : 2
5    2
7    7

S : W
7 : 6
7    6
13    13

Question 9  
మనంబెర్ల  
ఏకో మొదస్థానా

S : W
8 : 5
8    5
13    13

C

$$\frac{2}{7} \rightarrow \frac{6}{13} \rightarrow \frac{1}{13} \div \frac{35-26}{13 \times 7}$$

$$\left( \frac{1}{13} : \frac{9}{13 \times 7} \right) 7$$

$$\frac{6}{13} - \frac{5}{13} \quad \frac{5}{13} - \frac{2}{7}$$

$$7 : 9$$

$$\begin{aligned}
 \textcircled{11} \quad \text{వ్యాప} &= 69 \frac{3}{13}\% \\
 &= \frac{900}{13}\% \\
 &= \frac{900}{13} \times \frac{1}{100} \\
 &= \frac{9}{13} \rightarrow \text{వ్యాప} \quad \text{తేడా 4 చినెల} \\
 &\qquad\qquad\qquad \text{నీరు.}
 \end{aligned}$$

$$\text{వాటినీయ} = 9 : 4$$

$$\left| \begin{array}{r} m : w \\ 8 : 5 \\ \hline 8 & 5 \\ 13 & 13 \end{array} \right.$$

$$\begin{array}{r} m \ 8 W \\ 5 : 2 \\ \hline \frac{5}{7} \ \ \frac{2}{7} \end{array}$$

$$\left| \begin{array}{r} m : k \\ 9 : 4 \\ \hline 9 & 4 \\ \hline 13 & 13 \end{array} \right| \quad \text{watered \%} \\ \text{వరువు \%}$$

$$\begin{array}{c} \frac{5}{13} - \frac{2}{7} \\ \hline \frac{4}{13} \end{array}$$

$$\frac{26 - 28}{7 \times 13} : \frac{4 - 5}{13}$$

$$\left(\frac{2}{7} - \frac{4}{13}\right) \left(\frac{5}{13} - \frac{4}{13}\right)$$

1<sup>st</sup>  
వీరు  
25%

2<sup>nd</sup>  
ଦ୍ୱାରା  
50%

$$\begin{array}{l}
 \text{వీపు : వీఎల్} \\
 3 : 5 \\
 \text{వీఎల్ = } 37.5\%
 \end{array}$$

$$1^{\text{st}} = \frac{1}{2} \times 12 = 6 \text{ cm}$$

$$2^{\text{nd}} = \frac{1}{2} \times 12 = 6 \text{ g}_{\parallel}$$

Diagram illustrating a circular system with a central point. A vector of length  $10r_s$  extends downwards. From this point, two other vectors extend outwards: one to the left labeled  $x-10$  and one to the top-right labeled  $xR_s$ . The angle between the vertical  $10r_s$  vector and the  $xR_s$  vector is labeled  $7^{\circ} 2^{\text{nd}}$ . A vector of length  $9.3R_s$  also originates from the central point.

$$\frac{x-10}{0.7} = \frac{8}{7}$$

$$10x - 100 = 8$$

$$10x = 108$$

$$x = 10.80$$

వరసంధ్ర = 153 Rg

14

$$\begin{array}{r}
 \text{1} \\
 | \\
 126 \text{ R\$} \\
 -153 \\
 \hline
 -27 \\
 \rightarrow \times 1 \\
 \hline
 -27
 \end{array}
 \quad
 \begin{array}{r}
 \text{1} \\
 | \\
 135 \text{ R\$} \\
 -153 \\
 \hline
 -18 \\
 \rightarrow \times 1 \\
 \hline
 -18
 \end{array}
 \quad
 \begin{array}{r}
 \text{2} \\
 | \\
 x \text{ R\$} \\
 0.00 \text{ R\$} \\
 +45 \\
 \hline
 \frac{22.5}{2}
 \end{array}$$

$$3 \text{ வரடாஷ்டர்} = \frac{153}{22.5}$$


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$$\underline{\quad \quad \quad 175.5}$$

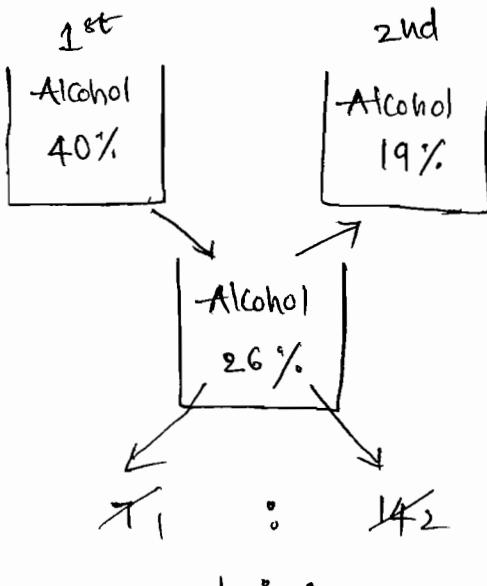
$$15 \quad \text{లొఫ్ట} = +, \quad \text{నెచ్చ} = -$$

A hand-drawn diagram showing three numbers at the top: 305, 314908, and 63. Arrows point from each number to a central value of 14%.

2 : 3

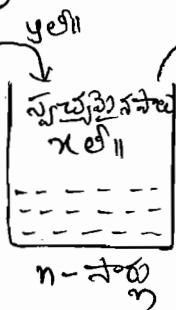
$$18\% \text{ රාජ්‍යම් ප්‍රවුත්තය} = \frac{3}{5} \times 1000 = 600 \text{ kg}$$

16



$$\text{సంఘర్షణ వరిమాణ} = \frac{2}{3}$$

17



$$\begin{aligned} \text{మిగిలిన స్వాచ్ఛత్వానికి వాయిదా} &= \\ &= x \left(1 - \frac{4}{x}\right)^n \\ &= 40 \left(1 - \frac{40}{10}\right)^3 \\ &= 40 \left(1 - \frac{1}{10}\right)^3 \\ &= 40 \left(\frac{9}{10}\right)^3 \\ &= 40 \left(\frac{729}{1000}\right)^3 \\ &= 29.16 \end{aligned}$$



$$1 - \frac{8}{x} = \frac{2}{3}$$

$$\frac{8}{x} = 1 - \frac{2}{3}$$

$$\frac{8}{x} \times \frac{1}{3}$$

$$x = 24$$

OR

Method 2:

ఫలితాలు 40 లీలలో ఎంతశాతం?

$$\begin{aligned} \text{శాతం} &= \frac{\text{లావేటి}}{\text{ఎండుటి}} \times 100 \\ &= \frac{4}{40} \times 100 \\ &= 10\% \end{aligned}$$

$$(i) 40 \text{లీ} \times \frac{90}{100} \times \frac{90}{100} \times \frac{90}{100} = 40 \left(\frac{729}{1000}\right) = 29.16$$

$$(ii) \frac{\text{మిగిలిన స్వాచ్ఛత్వానికి వాయిదా}}{\text{పొత్తు వరిమాణ}} = \frac{x \left(1 - \frac{4}{x}\right)^n}{x} = \left(1 - \frac{4}{x}\right)^n = \left(\frac{9}{10}\right)^3 = \frac{729}{1000} \rightarrow \text{పొత్తు}$$

మిగిలిన స్వాచ్ఛత్వానికి వాయిదా : నీటు = 729 : 271

18 మిగిలిన స్వాచ్ఛత్వానికి వాయిదా : నీటు = 16 : 65

$$\frac{\text{మిగిలిన స్వ.వైట}}{\text{పొత్తు వరిమాణ}} = \frac{16}{16+65} = \frac{16}{81}$$

$$\frac{\text{మిగిలిన స్వ.వైట}}{\text{పొత్తు వరిమాణ}} = \frac{x \left(1 - \frac{4}{x}\right)^n}{x} = \frac{16}{81}$$

$$\left(1 - \frac{4}{x}\right)^n = \frac{16}{81}$$

$$\left(1 - \frac{8}{x}\right)^4 = \frac{16}{81}$$

$$\left(1 - \frac{8}{x}\right)^4 = \left(\frac{2}{3}\right)^4$$

$$1 - \frac{8}{x} = \frac{2}{3}$$

$$\frac{8}{x} = 1 - \frac{2}{3}$$

$$\frac{8}{x} \times \frac{1}{3}$$

$$x = 24$$

19

$$\begin{aligned} A \text{ కుపు} &= 7x \\ B \text{ కుపు} &= 5x \\ A : B &= 7x : 5x \\ &= 7 : 5 \\ &= \frac{7x}{5x} = \frac{7}{5} \end{aligned}$$

$$\frac{28x - 21}{20x - 15 + 36} = \frac{7}{9}$$

$$\frac{7(4x - 3)}{20x + 21} = \frac{7}{9}$$

$$\frac{4x - 3}{20x + 21} \times \frac{1}{9}$$

$$36x - 27 = 20x + 21$$

$$16x = 48^3$$

$$x = 3$$

$$A \text{ కుపు} = 7x = 7(3) = 21$$

20

నీవు, సిరపు కల్పించేతుడు = 8 రూ. దొరి ప్రతి వరు.

ఇందులోని x రూ. తుఫాన్ లీచువు అన్నాడు.

$$\frac{w}{s} = \frac{3\text{రూ} - \frac{3}{8} \times x\text{రూ} + x\text{రూ}}{5\text{రూ} - \frac{5}{8}x\text{రూ}} = \frac{1}{1}$$

$$\frac{24 - 3x + 8x}{40 - 5x} = \frac{1}{1}$$

$$\cancel{24} + \cancel{5x} = \cancel{40} - \cancel{5x}$$

$$10x = 16$$

$$x = 1.6 \text{ రూ.}$$

$$\begin{aligned}\text{లేదువంసిన వర్షపరివ్యాప [ఖర్చు]} &= \frac{1.6}{8} \\ &= \frac{161}{805} \\ &= \frac{1}{5}\end{aligned}$$



# RATIO'S

1)

$$A:B = 5:7$$

$$B:C = 6:11$$

$$A:B:C = 30:42:77$$

2)

$$\frac{A}{B} \times \frac{B}{C} = \frac{3}{4} \times \frac{8}{9} = \frac{2}{3}$$

$$A:C = 2:3$$

3)

$$\frac{A}{B} \times \frac{B}{C} \times \frac{C}{D} = \frac{8}{15} \times \frac{5}{8} \times \frac{4}{5} = \frac{4}{15}$$

$$A:D = 4:15$$

4)

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

$$\frac{A}{B} : \frac{B}{C} : \frac{C}{A} = \left( \frac{2}{3} : \frac{3}{4} : \frac{4}{2} \right) \times 12$$

$$= 8:9:24$$

5)

$$A:B = \left( \frac{1}{2} : \frac{3}{8} \right) \times 8 = 4:3$$

$$B:C = \left( \frac{1}{3} : \frac{5}{9} \right) \times 9 = 3:5$$

$$C:D = \left( \frac{5}{6} : \frac{3}{4} \right) \times 12 = 10:9$$

$$A:B = 4:9$$

$$B:C = 3:5$$

$$C:D = 10:9$$

$$A:B:C:D = 4 \times 3 \times 10 : 3 \times 5 \times 10 : 3 \times 5 \times 10 : 3 \times 5 \times 9$$

$$= 8:6:10:9$$

6)

$A:B = 2:3$	$B:C = 4:5$
$C:D = 6:7$	

$$A:B:C:D = 2 \times 4 \times 6 : 3 \times 4 \times 6 : 3 \times 5 \times 6 : 3 \times 5 \times 7$$

$$= 16:24:30:35$$

7)

$\frac{A}{x} = \frac{B}{y} = \frac{C}{z} \Rightarrow x:y:z = A:B:C$	$  2,3,4$
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$$2A = 3B = 4C$$

કોણ 12 તરી હોયાં

કોણ 12

$$\frac{2A}{12} = \frac{3B}{12} = \frac{4C}{12}$$

$$\frac{A}{6} = \frac{B}{4} = \frac{C}{3}$$

$$A:B:C = 6:4:3$$

8)

$$\frac{A}{3} = \frac{B}{4} = \frac{C}{5}$$

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

$$2A = 3B \quad | \quad 4B = 5C$$

$$\frac{A}{B} = \frac{3}{2} \quad | \quad \frac{B}{C} = \frac{5}{4}$$

$$\frac{A}{B} \times \frac{B}{C} = \frac{3}{2} \times \frac{5}{4}$$

$$\frac{A}{C} = \frac{15}{8}$$

$$A:C = 15:8$$

10)

$$4^{\frac{3}{2}} : 2^5$$

$$4^{\frac{7}{2}} : 2^5$$

$$(4^{\frac{1}{2}})^7 : 2^5$$

$$(\sqrt{4})^7 : 2^5$$

$$\cancel{2}^2 : \cancel{2}^5$$

$$2^2 : 1$$

$$4 : 1$$

### Some Formula's

$a, b, c, d \in \mathbb{R}$

4 வகுபாதை  $a:b :: c:d$

$$= \boxed{bc = ad}$$

$$d = \frac{bc}{a}$$

3 வகுபாதை  $= \boxed{a, b, c}$

$$c = \frac{b^2}{a}$$

முக்குறள்பாதை  $= \sqrt{ab}$

$$(1) \quad \frac{1}{5} : \frac{1}{x} = \frac{1}{x} : \frac{1}{1.25}$$

$$\frac{1}{x} \times \frac{1}{x} = \frac{1}{5} \times \frac{1}{1.25}$$

$$\frac{1}{x^2} \times \frac{1}{6.25}$$

$$x^2 = 6.25$$

$$x = 2.5$$

$$(12) \quad 0.75 : x :: 5 : 8$$

$$x \times 5 = \underline{0.75} \times 8$$

$$x = 1.2$$

$$(13) \quad x:y = 5:2$$

$$x = 5, y = 2$$

$$\frac{8x+9y}{8x+2y} = \frac{8(5)+9(2)}{8(5)+2(2)}$$

$$= \frac{40+18}{40+4}$$

$$= \frac{58}{44} = \frac{29}{22} = 29:22$$

$$(14) \quad \frac{3}{15}x = \frac{4}{20}y$$

$$3x = 4y$$

$$x:y = 4:3$$

(15)

$$\frac{x}{y} = \frac{2}{1} \quad x=2, y=1$$

$$\frac{x^2 - y^2}{x^2 + y^2} = \frac{2^2 - 1^2}{2^2 + 1^2} = \frac{4-1}{4+1} = \frac{3}{5}$$

$$\frac{4x^2 - 3y^2}{2x^2 + 5y^2} \neq \frac{12}{19}$$

$$(16) \quad 76x^2 - 57y^2 = 24x^2 + 60y^2$$

$$52x^2 = 117y^2$$

$$\frac{x^2}{y^2} = \frac{117}{52} \quad (13 \times 9)(13 \times 4)$$

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

$$(17) \quad x^2 - 4xy + 4y^2 = 0$$

$$x^2 - 2ab + b^2 = 0$$

$$x^2 - 2(x)(2y) + (2y)^2 = 0$$

$$(x-2y)^2 = 0$$

$$x-2y = 0 \Rightarrow x = 2y$$

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

$$18) \quad 5x^2 - 13xy + 6y^2 = 0$$

$$5x^2 - 10xy - 3xy + 6y^2 = 0$$

$$5x(x-2y) - 3y(x-2y) = 0$$

$$(x-2y)(5x-3y) = 0$$

$$x-2y = 0$$

$$x = 2y$$

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

$$5x-3y = 0$$

$$5x = 3y$$

$$\frac{x}{y} = \frac{3}{5}$$

$$19) \quad \begin{array}{l|l} \frac{x}{5} = \frac{4}{8} & \frac{x+5}{y+8} = \frac{5+5}{8+8} \\ \frac{x}{4} = \frac{5}{8} & = \frac{10}{16} \\ x=5, y=8 & = \frac{5}{8} \end{array}$$

$$20) \quad \frac{a}{3} = \frac{b}{4} = \frac{c}{7}$$

$$a:b:c = 3:4:7$$

$$a=3, b=4, c=7$$

$$\frac{a+b+c}{c} = \frac{3+4+7}{7} = \frac{14}{7} = 2$$

$$21) \quad (a+b):(b+c):(c+a) = 6:7:8$$

$$a+b=6$$

$$b+c=7$$

$$c+a=8$$

$$2(a+b+c) = 21$$

$$a+b+c = 10.5$$

$$b+c = 10.5$$

$$c = 4.5$$

$$a+b+c \rightarrow 14$$

$$4:5 \rightarrow ?$$

$$= \frac{4 \times 3}{4+5} \times 14 = 8$$

$$= 3 \times 2$$

$$= 6$$

$$22) \quad A:B:C \text{ శీతు } = 2:3:5$$

A, B, C శీతు	200	300	500	గుర్తి
15%↑	10%↑	20%↑		
+30	+30	+100		
230	330	600		

$$\text{కొత్త శీతు} = 23\phi : 33\phi : 60\phi$$

$$= 23:33:60$$

$$23) \quad = \left( \frac{1}{2} : \frac{2}{3} : \frac{3}{4} \right) \times 12 \quad \boxed{2,3,4}$$

$$= 6:8:9$$

$$\text{కొత్త శీతు} = \frac{6}{23} \times 782 = 204$$

$$24) \quad 7, 5, 3, 4$$

$$\text{కొత్త శీతు} = \frac{3}{19} \times 76 = 12$$

25)

$$\text{కొత్త శీతు} \quad 3x, 5x \quad \text{గుర్తి}$$

$$\frac{3x-9}{5x-9} \times \frac{12}{23}$$

$$69x - 23 \times 9 = 60x - 12 \times 9$$

$$9x = 23 \times 9 - 12 \times 9$$

$$x = 11$$

$$\text{కొత్త శీతు} = 3(x) = 3(11) = 33$$

26)

$$1 : 2$$

$$3 : 5$$

$$\text{కొత్త} = 2$$

$$1 \times 5 - 3 \times 2$$

泰加

$$1 \rightarrow 14$$

$$2 \rightarrow ? = \frac{2 \times 14}{1} = 28$$

(27)

$$\begin{aligned} A:B &= 5:4 \\ B:C &= 9:10 \end{aligned}$$

$$A:B:C = 45:36:40$$

$$C \text{ వాటి} = \frac{40}{121} \times 1210 = 400$$

(28)

$$1 : 2 : 3$$

$$\begin{array}{rcl} 1x & = & 2x \quad 3x \text{ నాచీలనాథి} \\ 25p & & 20p \quad 5p \text{ నాచీనాయ} \\ \hline 25x & = & 20x \quad 15x \text{ మొత్తం రూప్యాలు} \\ 60x & = & 30 \times \frac{50}{100} \end{array}$$

$$x = 50$$

$$5 \text{ ఇంచుల నాచీలనాథి} = 3x = 3 \times 50 = 150$$

(29)

$$3 \text{ సంఖ్యలు } 3x, 4x, 5x$$

$$\text{మొత్తం మొత్తం} = (3x)^2 + (4x)^2 + (5x)^2 = 1250$$

$$= 9x^2 + 16x^2 + 25x^2 = 1250$$

$$50x^2 = 1250$$

$$x^2 = 25 \Rightarrow x = 5$$

$$\text{సంఖ్యల మొత్తం} = 3x + 4x + 5x$$

$$= 12(x)$$

$$= 12(5) =$$

$$= 60$$

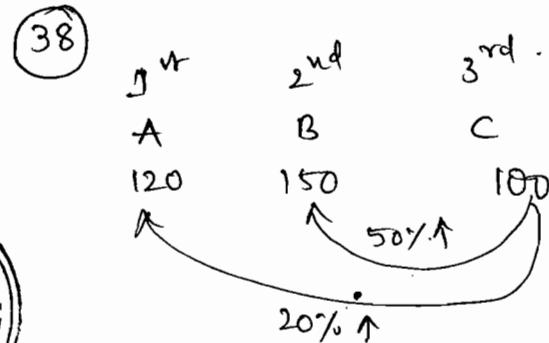
(37)

$$\frac{\frac{2}{4}}{15} A = \frac{2}{5} B$$

$$\frac{A}{B} = \frac{3}{2}$$

$$A:B = 3:2$$

$$\begin{aligned} B \text{ వాటి} &= \frac{2}{5} \times \frac{242}{1210} \\ &= 484 \end{aligned}$$



$$A:B = \frac{4}{120} : \frac{5}{150} = 4:5$$

విషయాల మొత్తం

- |         |      |              |
|---------|------|--------------|
| (a) 5:7 | 12 ✓ | 50 తాళ్ళాలు  |
| (b) 3:5 | 8 ✓  | పోలియోటిస్టు |
| (c) 3:4 | 7 X  |              |
| (d) 4:5 | 9 ✓  |              |

(40) Dozen = 12

- (a) 2:1 → (3) ✓
- (b) 3:2 → (4) ✓
- (c) 3:2 → (5) X
- (d) 7:5 → (12) ✓

(41) 5:7:8

మొత్తం 50, 70, 80 లల్లితాలు

40%↑ 50%↑, 75%↑

+20 +35 +60

ప్రధాన సంఖ్య 70, 105, 140

14: 21: 28

2: 3: 4

30) 3 సంఖ్యలు  $3x, 4x, 7x$   
 ~~$\frac{648}{2592} = 216$~~   
 $\text{లక్షం} = 3x \times 4x \times 7x = 18144$

$$\begin{aligned} x^3 &= 216 \\ x^3 &= 6^3 \\ x &= 6 \end{aligned}$$

8 సంఖ్యలు  $= 3x, 4x, 7x$   
 $= 3 \times 6, 4 \times 6, 7 \times 6$   
 $= 18, 24, 42$

31)

Rain : Sunlit

$$\begin{array}{l} 2 : 3 \\ \cancel{4000} \\ 40 : 57 \\ \hline 3 : 14 \end{array}$$

$$\begin{array}{l} \text{Sunlit పొత్తు} = 34000 \\ \text{Sunlit వ్యతిశ్యాతు} = 34000 + 4000 \\ = 38000 \end{array}$$

$$\begin{array}{l} 57 \times 2 - 40 \times 3 \\ 114 - 120 \\ \hline 6 \text{ లక్ష } \rightarrow 68000 \\ 38 \rightarrow 34000 \end{array} \rightarrow 17 \times 40000$$



32)

$$\begin{array}{l} A = \frac{2}{3} B \quad | \quad B = \frac{1}{4} C \\ \frac{A}{B} = \frac{2}{3} \quad | \quad \frac{B}{C} = \frac{1}{4} \\ \hline A : B = 2 : 3 \\ B : C = 1 : 4 \\ \hline A : B : C = 2 : 3 : 12 \end{array}$$

$$A = \frac{2}{17} \times \frac{30}{5+0} = 60$$

$$B = \frac{3}{17} \times \frac{30}{5+0} = 90$$

$$C = \frac{12}{17} \times \frac{30}{5+0} = 360$$

33)  $a, b, c$

$$\begin{array}{l} a : b = 2 : 3 \\ b : c = 5 : 8 \end{array}$$

$$a : b : c = 10 : 15 : 24$$

$$\text{రోడ్ పొర్టు} = \frac{15}{49} \times \frac{2}{98} = 30$$

34)

$$\frac{3}{11} : \frac{5}{9} = x : \frac{1}{27}$$

$$\frac{5}{9} \times x = \frac{3}{11} \times \frac{1}{27} \\ x = \frac{1}{55}$$

35)

$$\begin{array}{l} A = \frac{1}{2} (B+C) \quad | \quad B = \frac{2}{3} (A+C) \\ \frac{A}{B+C} = \frac{1}{2} \end{array}$$

$$A \text{ లక్ష} = \frac{A}{A+B+C} = \frac{1}{1+2} = \frac{1}{3}$$

$$A \text{ లక్ష} = \frac{1}{3} \times \frac{122}{366} \\ = 122$$

36)

$$\begin{array}{l} P : Q = 2 : 3 \\ Q : R = 9 : 3 \\ R : S = 9 : 3 \end{array}$$

$$P : Q : R : S = 8 : 12 : 18 : 27$$

$$P \text{ లక్ష} = \frac{8}{65} \times \frac{20}{1300}$$

$$= 160$$

(42)

7 : 8

పొదు	పోల్చిద
70	80
20%↑	10%↑
+14	+8
<hr/>	<hr/>
84 : 88	
21 : 22	

(43)

$$A : B : C : D$$

$$5 : 2 : 4 : 3$$

తేలా = 1

$$1 \rightarrow 1000$$

$$B \text{ వాట } 2 \rightarrow 2000$$

(44)

$$\text{సంఖ్య} = x, y$$

$$40\%x = \frac{2}{3}xy$$

$$\frac{2}{5}xx = \frac{2}{3}xy$$

$$\frac{x}{y} = \frac{5}{3}$$

$$x:y = 5:3$$



$$A:B \text{ సంవాదమాన } = 4:7$$

$$A, B \text{ సంవాదమాన } = 4x, 7x \text{ ఉపాధి}$$

$$\begin{array}{l} \downarrow \\ 50\% \uparrow \end{array} \quad \begin{array}{l} \downarrow \\ 25\% \uparrow \end{array}$$

$$+2x \quad -\frac{7x}{4}$$

$$\text{శీతం రాశి} = 6x, \frac{21x}{4} \quad \left(7x - \frac{7x}{4}\right)$$

$$\frac{6x}{\frac{21x}{4}} = \frac{8}{7}$$

Data insufficient

(46)

a, b, c, d ఒక అనుపత్తి లేనివి.

$$a:b :: c:d$$

$$ad = bc$$

$$\begin{aligned} \text{పుట్టమణి లభించింది} &= \\ \text{అంతర్వమణి లభించింది} &= \end{aligned}$$

$$14, 17, 34, 42 \text{ ఉన్నాంటాను తేలిస్తే}$$

$$14-x, 17-x, 34-x, 42-x$$

$$(14-x)(34-x) = (14-x)(42-x)$$

$$x^2 + 17x - 34x = 17x - 34x = x^2 + 14x - 42$$

$$56x - 51x = 42x - 14x - 17x + 34$$

$$5x = 588 - 578$$

$$5x = 10$$

$$x = \frac{10}{5} = 2$$

(47)

$$\begin{array}{c} 60 \\ \swarrow \quad \searrow \\ \text{వాట} \quad \text{సెట్} \\ 2 : 1 \end{array}$$

$$\begin{array}{c|c} = \frac{2}{3} \times 60 & \frac{1}{3} \times 60 \\ \hline = 40 \text{ ఉపాధి} & = 20 \text{ ఉపాధి} \end{array}$$

$$\frac{m}{w} = \frac{40 \text{ ఉపాధి}}{20 \text{ ఉపాధి} + x} \times \frac{1}{2}$$

$$80 = 20 + x$$

$$x = 80 - 20$$

$$x = 60$$

(48)

$$ab, c, d = ad = bc$$

$$5, 8, 15, d \quad d = \frac{bc}{a}$$

$$d = \frac{8 \times 15}{5}$$

$$d = 24$$

(49)

$$ab \text{ లభ్యమణి అనుపత్తి} = \sqrt{ab} = \sqrt{234 \times 104}$$

$$\begin{array}{c|cc|c|cc} 2 & 234 & 2 & 104 \\ 13 & 117 & 2 & 52 \\ 3 & 9 & 2 & 26 \\ 3 & 1 & 2 & 13 \end{array}$$

$$= \sqrt{2 \times 13 \times 3 \times 3 \times 2 \times 2 \times 13}$$

$$= 13 \times 3 \times 2 \times 2$$

$$= 156$$

$$50) \text{ } a, b \text{ ల త్రైయ అనుపాతం} = \frac{b^2}{a}$$

$$0.36, 0.48 \text{ ఉ } " \quad " = \frac{0.48 \times 0.48}{0.36}$$

$$= 0.64$$

$$51) \text{ } a, b \text{ ల త్రైయ అనుపాత సమితి} = \frac{b^2}{a}$$

$$(x-y), (x-y) \text{ " } " = \frac{(x-y)^2}{x^2-y^2} = \frac{(x-y)^2}{(x+y)(x-y)}$$

$$= \frac{x-y}{x+y}$$

$$52) 12,30 \text{ ల త్రైయ అనుపాతం} = \frac{b^2}{a} = \frac{30 \times 30}{12}$$

$$9,25 \text{ ల వృథత అనుపాతం} = \sqrt{ab}$$

$$= \sqrt{9 \times 25} = 3 \times 5 = 15$$

$$\text{విషాదితి} = \frac{5}{\frac{12+6}{15}} \Rightarrow \frac{5}{1} = 5 : 1$$

$$53) \text{ } a : b \quad | \quad \begin{array}{r} 3 : 4 \\ \hline 12 \end{array}$$

$$\text{లోగ్గుపడు} \quad \text{ట్రైక్పాడు} \quad | \quad 3 \rightarrow 12$$

$$4 \rightarrow ? = \frac{4 \times 12}{3} = 16$$

$$54) \text{ Scooter : TV} = 7 : 5 \quad \text{అంగం} = 2$$

$$2 \xrightarrow{\times 4} 8000$$

$$5 \xrightarrow{\times 4} ? \quad 20,000$$

$$55) \text{ } A, B, C \text{ ల } 735 \text{ రూపీ వాటాలు}.$$

$$25 + 25 + 25 = 75$$

$$1 : 3 : 2 \text{ విషాదితి మాన్యము} = 735 - 75 = 660$$

$$\text{C వాటా} = \frac{2}{5} \times 660 = 220 \text{ (660 రూపీలలో)}$$

$$\text{అసలిచాట} = 220 + 25 = 245$$

$$56) \text{ వెస్ట్రూ} = 2430$$

$$A \quad B \quad C$$

$$-15 \quad -10 \quad -15 = -30 \text{ త్రైయింది.}$$

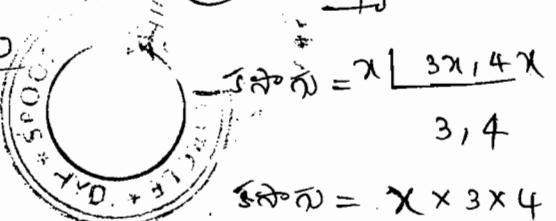
$$2430 - 30 = 2400$$

2400 రూపీలను - A, B, C ల N 3 : 4 : 5 విధంగా

$$\text{B వాటా} = \frac{4}{12} \times 2400 = 800 \text{ (2400 రూపీల వాటా)}$$

$$\text{అసలిచాట} = 800 + 10 = 810 \text{ (2430 రూపీల వాటా)}$$

$$57) \text{ సమితి} = 3x, 4x \text{ ల సుమారు.}$$



$$\text{ఇంశాగు} = x \times 3 \times 4 = 12x$$

$$12x = 180$$

$$x = 15$$

$$\text{మొదటి సమితి} = 3(x) = 3(15) = 45$$

58)

$$\text{Copper : Zinc} = 9 : 4$$

$$\text{Copper } 9 \rightarrow 24 \text{ kgs}$$

$$\text{Zinc } 4 \rightarrow ? = \frac{4 \times 24}{9}$$

$$= \frac{96}{9} -$$

$$= \frac{32}{3} = 10 \frac{2}{3} \text{ kgs}$$

$$59) \text{ } 60 \text{ kgs} \quad | \quad \begin{array}{r} \text{Lead} \quad \text{Tin} \\ 3 : 2 \end{array}$$

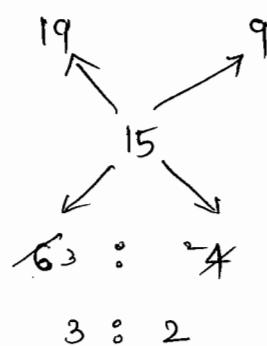
$$= \frac{2}{5} \times 60 = 24 \text{ kgs}$$

$$100 \text{ kgs} \quad | \quad \begin{array}{r} \text{Tin} \quad \text{Copper} \\ 1 : 4 \end{array}$$

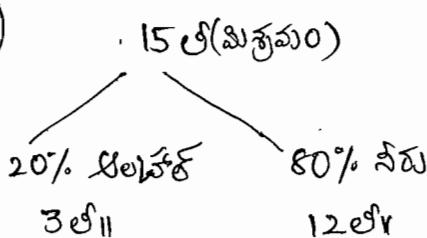
$$= \frac{1}{5} \times 100 = 20 \text{ kgs}$$

$$\text{మొత్త} \pi n = 24 + 20 = 44 \text{ kg.}$$

(60)



(61)



$$\frac{\text{Alcohol}}{\text{Water}} = \frac{3\text{ l}}{12\text{ l} + 3\text{ l}} = \frac{3\text{ l}}{15\text{ l}}$$

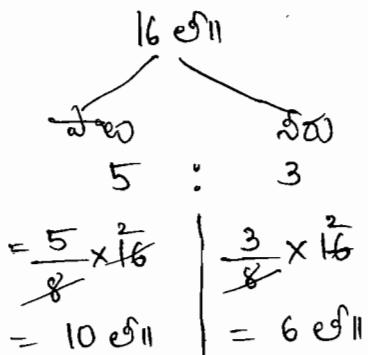
$$\text{కొత్త పురుషం వర్ణమానం} = 18\text{ l}$$

$$\begin{aligned} \text{ఇట్టుడు Alcohol శతం} &= \frac{\text{పాశ్వం}}{\text{పురుషం వర్ణమానం}} \times 100 \\ &= \frac{3}{18} \times 100 \\ &= 66.66 / 66\frac{2}{3}\% \end{aligned}$$

(62)

20 లీ పురుషం దింది

20 లీ దిందిలో 4 లీ పురుషం ను వెన్ని విధంగా? (6లీ)



$$\frac{\text{milk}}{\text{water}} = \frac{10\text{ l} + 4\text{ l}}{6\text{ l}} = \frac{14}{6} = \frac{7}{3} = \frac{7}{3}$$

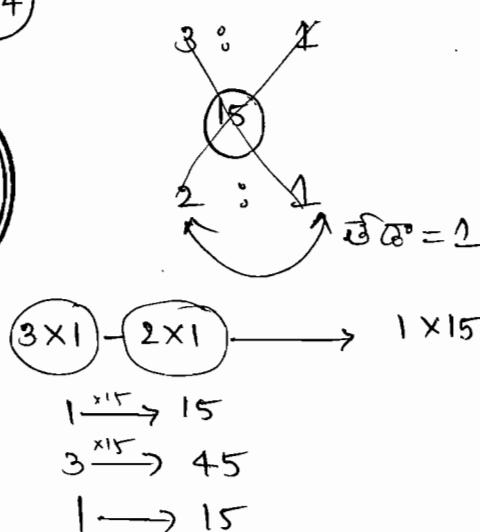
$$\text{milk : water} = 7 : 3$$

(63)

$$\begin{aligned} 85 \text{ ప్రెసిటెమం} & \\ \text{పాశ్వ} & \quad \text{లేదా} \\ = 27 & \quad : \quad 7 \\ = \frac{27}{34} \times \frac{5}{2} & \quad \left| \frac{7}{34} \times \frac{5}{2} \right. \\ = \frac{135}{2} & \quad = \frac{35}{2} \\ = 67.5 & \quad = 17.5 \end{aligned}$$

$$\begin{aligned} \frac{m}{\omega} &= \frac{67.5}{17.5 + x} \times 3 \\ 67.5 &= 52.5 + 3x \\ 3x &= 15 \\ x &= 5 \end{aligned}$$

(64)



$$\begin{aligned} 3 \times 1 - 2 \times 1 &\rightarrow 1 \times 15 \\ 1 \xrightarrow{1 \times 15} 15 & \\ 3 \xrightarrow{3 \times 15} 45 & \\ 1 \rightarrow 15 & \end{aligned}$$

(65)

$3x, 5x, 7x$  అనుమతమయి

$$\begin{aligned} &= \frac{3x + 5x + 7x}{3} = 95 \\ &= 15x = 75 \\ &x = 5 \end{aligned}$$

$$\text{టెస్ట్ ఫ్లో} = 3(x) = (3(5)) = 15 \text{ నోలీ}$$

(66)

తెగు లఘ్యత =  $5 : 4 : 6$

$$\text{టెస్ట్ ఫ్లో} = [5, 4, 6] = 60$$

$$\text{భూగోళం} = \frac{5}{60} : \frac{4}{60} : \frac{6}{60}$$

$$\text{హెగలనిఘ్యత} = \frac{1}{12} : \frac{1}{15} : \frac{1}{10}$$

$$\text{నిఘ్యత} = 12 : 15 : 10$$

(67) Boys : Girls  
8 : 5  
 $5 \rightarrow 160$   
 $\underline{13} \rightarrow ? = \frac{13 \times 160}{5} = 416$

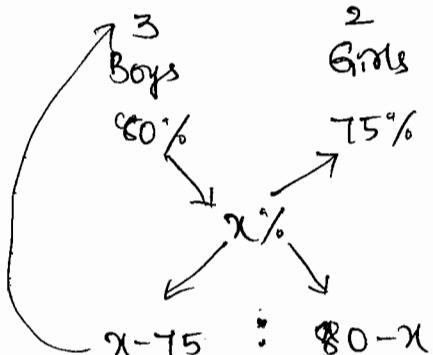
(68) ஆட்களின் விதி  $= \frac{1}{2} : \frac{1}{3} : \frac{1}{4}$  234  
 $\text{கீழ்-ஈ = } 12$   
 $= \left( \frac{1}{2} : \frac{1}{3} : \frac{1}{4} \right) \times 12$   
 $= 6 : 4 : 3$

கிருதங்கள்  $= \frac{6}{13} \times 104 = 48$

நாயர்	நாளை	வெந்து
300	200	500
சுலபக்ஷி - 60 முடி	50 முடி	110 முடி
தீவாரி - 240	150	390 முடி
$= \frac{78}{500} \times 100$		
$= 78\%$		

(OR)

Scholarship பேராசி - Allegation & Rule



$$\frac{x-75}{80-x} \times \frac{3}{2}$$

$$2x - 150 = 240 - 3x$$

$$5x = 390$$

$$x = 78$$

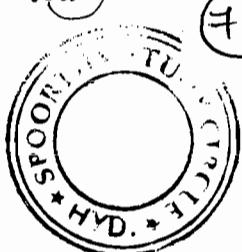
(70)  $10\% b = \frac{1}{4} g$   
 $\frac{1}{10} b = \frac{1}{4} g$   
 $b:g = 5:2$

(71)  $(3 : 4 : 5) \times 70$

210	280	350
4:1	3:1	5:2
$\frac{4}{5} : \frac{1}{5}$	$\frac{3}{4} : \frac{1}{4}$	$\frac{5}{7} : \frac{2}{7}$

$$\begin{aligned} \text{Milk} &= \frac{\frac{4}{5} \times 210 + \frac{3}{4} \times 280 + \frac{5}{7} \times 350}{\text{Water}} \\ &= \frac{\frac{1}{8} \times 210 + \frac{1}{4} \times 280 + \frac{2}{7} \times 350}{1} \\ &= \frac{168 + 210 + 250}{42 + 70 + 100} = \frac{628}{53} \end{aligned}$$

$$m:w = 157:53$$



(72)

$$y^2 \propto \frac{1}{x}$$

$$\frac{y_1^2}{y_2^2} = \frac{x_2}{x_1}$$

$$y_1 = 2, y_2 = 6, x_1 = 1, x_2 = ?$$

$$\frac{2 \times 2}{6 \times 6} = \frac{x_2}{1} = x_2 = \frac{1}{9}$$

(73)  $10\% x = 20\% y$

$$1x = 2y$$

$$x:y = 2:1$$

(74) Current Bill = Fixed + Variable  
 $\text{₹}50 + \text{வாணியில் வரும்}$

→ Fixed ( $\text{₹}50$ ) bill =  $x \text{ Rs} + 250 \text{ வரும்}$

$$\text{Charge} = y \text{ Rs}$$

$$\begin{array}{r}
 x + 500y = 1800 \rightarrow ① \\
 x + 620y = 2040 \rightarrow ② \\
 \hline
 0 - 1 \quad 80y = 240 \\
 y = 3 \text{ Rs}
 \end{array}$$

$$\begin{aligned}
 & \rightarrow x + 540 \times 3 = 1800 \\
 & x = 1800 - 1620 \\
 & x = 180
 \end{aligned}$$

Q: 500 units bill ?

$$\begin{aligned}
 &= x + 500y \\
 &= 180 + 500 \times 3 \text{ Rs} \\
 &= 180 + 1500 \\
 &= 1680
 \end{aligned}$$

	A	B
8000	$5x$	$4x$
3y	$3y$	$2y$

$$\text{8000} \quad | \quad 5x - 3y = 1600 \quad | \quad 4x - 2y = 1600$$

$$\begin{aligned}
 (5x - 3y = 1600) \times 2 \\
 (4x - 2y = 1600) \times 3
 \end{aligned}$$

$$\begin{aligned}
 10x - 12x = -1600 \\
 -2x = +1600 \\
 x = 800
 \end{aligned}$$

$$\begin{aligned}
 -A \text{ 8000} = 5(x) \\
 = 5 \times 800 \\
 = 4000
 \end{aligned}$$

76)  $\frac{20}{28} : 9 \rightarrow 28 : 8$

வைத்து 20  $\rightarrow ?$

$$\begin{aligned}
 &= \frac{20 \times 2^{\frac{3}{2}}}{9} \\
 &= 64.
 \end{aligned}$$

77)  $\frac{2}{3} : \frac{1}{4} \times \frac{1}{2} = \frac{2}{1} \Rightarrow 2 : 1$

78)  $0.4x = 0.06y$

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

$$\frac{x}{y} = \frac{3}{20}$$

$$x:y = 3:20$$



79)  $\frac{6-x}{7-x} < \frac{16}{21}$

$$21 \times 6 - 21x = 16 \times 7 - 16x$$

$$126 - 21x = 112 - 16x$$

$$5x = 14$$

$$x = \frac{14}{5} = 2.8 / \approx 3$$

80)

G:C	
(7:2) $\times 2$	

G:C	
7:11	

வைத்து 9

வைத்து 18

நவூல் சீர்யக்

14 : 4

7 : 11

மூலப்பு G:C = (14+7):(4+11)

$$= 21:18$$

$$= 7:5$$

81) A)  $\frac{7}{15} = 0.46$

B)  $\frac{15}{23} = 0.65$

C)  $\frac{17}{25} = 0.68$

$\checkmark$  D)  $\frac{21}{29} = 0.7$

82)  $A:B = 4:3$

మొత్తం నుండి = 7

B)  $3 \xrightarrow{\times 16} 4800$

మొత్తం 7  $\xrightarrow{\times 16} ? 11200$

83)

8 RS ఒకొరు		
B	A	C
x RS	(x+7)	(x-8) RS



$$x + x + 7 + x - 8 = 53$$

$$3x = 54$$

$$x = 18$$

$$A : B : C$$

$$x+7 : x : x-8$$

$$18+7 \quad 18 \quad 18-8$$

$$25 : 18 : 10$$

84) కొల్పానిస్తుటి =  $\frac{2}{5} : \frac{7}{5}$

$$\text{ఫీటం} = 40$$

$$5 \xrightarrow{\times 8} 40$$

$$2 \xrightarrow{\times 8} 16$$

$$7 \xrightarrow{\times 8} 56$$

$$\text{కొల్పానిస్తుటి} = 16 : 56$$

# PARTNERSHIP

ଲାଭାଳ ନିଷ୍ପତ୍ତି =  $\frac{\text{ଏକ୍ସିଚେକ୍ଟର ନିଷ୍ପତ୍ତି}}{(\text{ଟେଲି} \times \text{ଟେଲି})}$

$$\textcircled{1} \quad \frac{17}{\cancel{85000}} : \frac{3}{\cancel{15000}} \quad (\text{બેન્ડાંગ})$$

$$\textcircled{2} \quad A : D = \frac{9}{22500} : \frac{14}{35000}$$

$$A:D = \frac{1}{2} \times 100\% = 9 : 14$$

$$\text{Deepak} = \frac{14}{23} \times 13800 \\ = 8400$$

$$\textcircled{3} \quad A:B:C = \frac{7}{35000} : \frac{9}{45000} : \frac{11}{55000}$$

$$= 7:9:11$$

$$\text{Average} = \frac{7}{27} \times 4500 = 10500$$

$$\text{B.वापर} = \frac{9}{27} \times 40500 = 13500$$

$$C\text{संवृत्त} = \frac{11}{27} \times 40500 = 16500$$

$$④ R : S = \frac{5}{35000 \times 8} : \frac{3}{42000 \times 10}$$

$$= 2 : 3$$

$$R = \frac{2}{5} \times \overset{6314}{31570} \\ = 12628$$

$$\textcircled{5} \quad K:S = \frac{9}{3} : \frac{12}{3} = 27 : 14$$

$$\text{Sameer's age} = \frac{14}{41} \times 6970 = 2380$$

$$\textcircled{6} \quad S : N = 50,000 \times \frac{6}{3} : 80,000 \times \frac{4}{3} \\ = 3 : 4$$

$$S \text{ वार्ष} = \frac{3}{7} \times 24500 \\ = 10500$$

$$\text{Q7} \quad A:B:C = \cancel{20}^4 \times \cancel{24}^4 \text{ sec} : \cancel{15}^3 \times \cancel{24}^4 \text{ sec} : \cancel{20}^5 \times \cancel{18}^3 \text{ sec}$$

$$= 4:3:3$$

$$B_{\text{avg}} = \frac{3}{10} \times 2500 \text{ N}$$

$$A : R : S = \frac{14}{10} : \frac{6}{105} : \frac{15}{105} = 140 : 24 : 30$$

$$⑨ K : H_2O = \cancel{8}^3 : \cancel{6}^2 : \cancel{8}^4 \Rightarrow 3 : 2 : 4$$

$$K_{\text{sw}} = \frac{2}{g} \times \frac{445}{4005}$$

$$= 890$$

$$= \frac{3}{120} : \frac{4}{160} : \frac{7}{280}$$

11) A : B : C

$$25 \times 1\text{ సెంటి} + 35 \times 2\text{ ప్రా} : 35 \times 2\text{ సెంటి} + 25 \times 1\text{ సెంటి} : 30 \times 3\text{ సెంటి}$$

↑  
అదనంగా 10  
↑  
-10 తేసుకొన్నాడు

$$= 5(16+11+3) : 5(12+17+3) : 21 \times 6$$

$$= 49 : 63 : 42$$

↑      9      6

$$A : B : C = 7 : 9 : 6$$

↑  
3 లభిత

$$\text{B లభిత} = \frac{3}{22} \times 26400$$

$$= 3600$$

12) Sekhar : Rajini : Jatin

$$25 \times 1\text{ సెంటి} + 35 \times 1\text{ సెంటి} + 45 \times 1\text{ సెంటి} : 35 \times 2\text{ సెంటి} :$$

↑  
10K  
↑  
అదనంగా  
↑  
10K  
అదనంగా

$$35 \times 1\text{ సెంటి}$$

(14)  $A : B : C$  (60x6 సెంటి)

$$= (50 \times 4\text{ సెంటి} + 25 \times 8\text{ సెంటి}) : (45 \times 6\text{ సెంటి} + 30 \times 6\text{ సెంటి}) :$$

↑  
-25  
↑  
సగంచివసుహాలీ  
↑  
 $\frac{1}{3} \times 15 = 15$

$$(200+200) : (270+180) : 420$$

$$40\phi : 45\phi : 42\phi$$

$$40 : 45 : 42$$

(A)  $= \frac{40}{127} \times 5080 = 1600$

(B)  $= \frac{45}{127} \times 5080 = 1800$

(C)  $= \frac{42}{127} \times 5080 = 1680$

13) ప్రమాదా (6000, 12000 రూ.) లక్షీ A, B యొక్క వ్యవాధి భోగసామిములు ఉన్నారు. 3 మాసాల తరువాత A, 5000 వెన్నిటీసుకొన్నాడు, B ఈటా 5 వీటి పెట్టుబడ్డి ఉన్నాడు.

ఈటా 3 నెలల తర్వాత C 21000 లక్షీ వ్యవాధి భోగించాడు. 1 సెంటి తర్వాత వ్యవాధిను 26400 రూపాయలక్షీ కొట్టాడి. B యొక్క బిఫీక్కత ఎంత?

$$A : B : C = 16 \times 3\text{ సెంటి} + 11 \times 9\text{ సెంటి} :$$

↑  
-5000

$$12 \times 3\text{ సెంటి} + 17 \times 9\text{ సెంటి} :$$

↑  
+5000  
↑  
అదనంగా

$$21 \times 6\text{ సెంటి}$$

15)

$$A : B : C$$

$$x+9000 : x+5000 : x$$

↑  
+4000  
↑  
+5000

$$x+9000 + x+5000 + x = 50,000$$

$$3x = 36000$$

$$x = 12000$$

○ A      B      C  
 ○  $x+9000$      $x+5000$      $x$   
 ○  $21000$      $17000$      $12000$   
 ○  $21 : 17 : 12$   
 ○  $A\text{వారు} = \frac{21}{50} \times 35000$   
 ○  $= 14700$

(16)  $2A = 3B$      $4C = B$   
 $\frac{A}{B} = \frac{3}{2}$      $\frac{B}{C} = \frac{4}{1}$   
 $A:B = 3:2$      $B:C = 4:1$   
 $\underline{A:B = 3:2}$   
 $\underline{B:C = 4:1}$   
 $\underline{A:B:C = 12:8:2}$   
 $= 6:4:1$   
 $B\text{వారు} = \frac{4}{14} \times 16500$   
 $= 6000$

(17)  $4A = 6B = 10C$   
 $\text{రసాను} = 60$  అంగ్రేష్ రూపాలు  
 $\frac{A}{15} = \frac{6}{60} = \frac{10}{60}$

$A:B:C = 15:10:6$   
 $C\text{వారు} = \frac{6}{31} \times 4650 = 900$

(18)      A      B      C  
 చెట్టు     $x$      $2x$      $3x$   
 కొలం     $12\text{ సెమి}$      $6\text{ సెమి}$      $4\text{ సెమి}$   
 రెప్పు వుండి  $12x$      $12x$      $12x$   
 1 : 1 : 1.

$$C\text{వారు} = \frac{1}{3} \times 27000$$

$$= 9000$$

(19)  $A:B:C = 7:8:11$

$$B\text{వారు} = \frac{8}{26} \times 520$$

$$= 160$$

(20)  $A:B:C = \frac{2}{7 \times 10} : \frac{2}{5 \times 12} : \frac{3}{3 \times 15}$

$$= 14:12:9$$

$$C\text{వారు} = \frac{9}{35} \times 175$$

$$= 45$$

(21)  $A:C = (2:1) \times 3 = 6:3$   
 $A:B = (3:2) \times 2 = 6:4$   
 $A:B:C = 6:4:3$

$$B\text{వారు} = \frac{4}{13} \times 157300$$

$$= 48400$$

(22)  $A:B:C = 3 \times \frac{2}{12} : 5 \times \frac{2}{12} : 5 \times \frac{2}{6}$   
 నమోదు చేయాలి

$$= 6:10:5$$

(23)  $A:B:C \text{ రోపి} = \left( \frac{1}{2} : \frac{1}{3} : \frac{1}{4} \right) \times 12$   
 $= 6:4:3$

$A:B:C \text{ రోపి} = 6 \times 2 \text{ సెమి} + 3 \times 10 \text{ సెమి} : -3 \text{ సెమి}$   
 లొసంగు ||

$$= 4 \times 12 \text{ పె} : 3 \times 12 \text{ పె}$$

$$= 48 : 36 : 36$$



$$= 7 : 8 : 6$$

$B \text{ వాట} = \frac{8}{21} \times 378^{18}$  (18x8)

$= 144$

24)  $A, B, C \text{ రుణ నిష్టత్తు} = \left( \frac{7}{2} : \frac{4}{3} : \frac{6}{5} \right) \times 30$

$= 105 : 40 : 36$

కుశంసం రాయంథా దీండ్రించువు  $\times 2$  తో గుదీంచుటి

$= 210 : 80 : 72.$

$\rightarrow = 210 \times 4\frac{1}{3} + 315 \times 8\frac{1}{3} : 80 \times 12\frac{1}{3} : 72 \times 12\frac{1}{3}$

$+ 50\% \uparrow$

$+ 105$

$= 840 + 2520 : 80 \times 12 : 72 \times 12$

$= 3360 : 80 \times 12 : 72 \times 12 \quad \div 2$

$= 35 : 10 : 9$

$B \text{ వాట} = \frac{10}{54} \times 24600$

$= 4000$

25)  $A : B : C \text{ రుణ} = 1 : 3 : 5$

Point Aroid కోసం '2' తో గుదీంచుటి

$A : B : C \text{ రుణ} = 2 : 6 : 10$

$A : B : C \text{ లెప్పెట్లు నిష్టత్తు} =$

$2 \times 4\frac{1}{3} + 4 \times 8\frac{1}{3} : 6 \times 4\frac{1}{3} + 3 \times 8\frac{1}{3} : 10 \times 4\frac{1}{3} + 5 \times 8\frac{1}{3}$

$\uparrow \text{సమాం}$

$\uparrow \text{సగం}$

$\uparrow \text{తెల్కి}$

$= 40 : 48 : 80$

$5 \quad 6 \quad 10$

$= 5 : 6 : 10$

26)  $A : B \text{ రుణ} = 4 : 5$

$A : B \text{ లెప్పెట్లు నిష్టత్తు} =$

$= 4 \times 3\frac{1}{3} + 3 \times 7\frac{1}{3} : 5 \times 3\frac{1}{3} + 4 \times 7\frac{1}{3}$

$\frac{1}{4} \times 4 = 1$

$\frac{1}{5} \times 8 = 1$

$= 33 : 43$

$A \text{ వాట} = \frac{33}{76} \times 160$

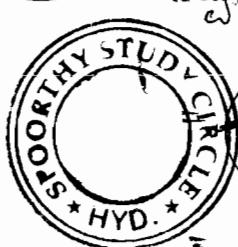
$= 330$

27) వ్యత్రు మాలధర్మ =  $x$  Rs

వ్యత్రు రూలు =  $t$

A	B	C
$\frac{x}{6}$	$\frac{x}{3}$	$\frac{x}{2}$
$\frac{t}{6}$	$\frac{t}{3}$	$t$

$\text{వ్యత్రు} \frac{x \times t}{6} : \frac{x \times t}{3} : \frac{x \times t}{2} \quad : \frac{x \times t}{2}$



$\frac{1}{36} : \frac{1}{9} : \frac{1}{2} \times 36$

$= 1 : 4 : 18$

$B \text{ వాట} = \frac{4}{23} \times 4600$

$= 800$

28)  $A : B : C \text{ లెప్పెట్లు నిష్టత్తు} =$

$= 65 \times 6\frac{1}{3} : 84 \times 5\frac{1}{3} : 100 \times 3\frac{1}{3}$

$= 13 : 14 : 10$

$\text{వ్యత్రు రాయి} = 7400$

$A 5\% = \frac{-370}{7030}$

$B \text{ వాట} = \frac{14}{37} \times 7030 = 2660$

Business  
10 సార్లు  
28% DB

29) లాభాలనిష్టతీ = పెట్టుబడులనిష్టతీ  
 $2:3 = 2:3$

$\textcircled{X} \quad 2 \xrightarrow{\times 2} 40,000$

$\textcircled{Y} \quad 3 \xrightarrow{\times 2} ? 60,000$

30)  $9000 \text{ రూప్యాలు}$   
 Manik  $\quad 6000$       Rowik  $\quad 3000$

పెట్టుబడులనిష్టతీ = లాభాలనిష్టతీ

$$\frac{M}{R} = \frac{20,000 \times 12\text{ సంవత్సరమ}}{x \times 12\text{ సంవత్సరమ}} = \frac{2000}{x}$$

$x = 5000$

31) లాభాల (1000 మొత్తం రూప్యాలు)

A	B	C
500	300	200
5 : 3 :	:	

$\textcircled{A} \quad 5 \xrightarrow{\times 2} 10,000$

$\textcircled{C} \quad 2 \xrightarrow{\times 2} ? 4,000$



32)

$$A:B:C \text{ పెట్టుబడులనిష్టతీ} = 21:12:81$$

$$= 3:8:9$$

$\textcircled{C} \quad 9 \xrightarrow{\times 4} 36000$

మొత్తం  $20 \xrightarrow{\times 4} ? 80,000$

33) A B

మార్గధర్మం  $3x$   $x$

కాలో  $2t$   $t$

పెట్టుబడి  $6xt$   $: xt$

$6 : 1$

$\textcircled{B} \quad 1 \xrightarrow{\times 4} 4000$

మొత్తం  $7 \xrightarrow{\times 4} ? 28,000$

34) B వ్యవహారంలో x సంలపత్రాల చేరాడు.  
 B వ్యవహారంలో  $(12-x)$  సంలపత్రాలు ఉంది.

$$\frac{A}{B} \text{ పెట్టుబడులనిష్టతీ} = \frac{A}{B} \text{ లాభాలనిష్టతీ}$$

$$\frac{21,000 \times 12\text{ సంవత్సరమ}}{36,000 \times (12-x)} = \frac{1}{1}$$

$7 = 12 - x$

$x = 5$

35) B x సంయాదాలలో చేసినవి.

$$\frac{A}{B} \text{ పెట్టుబడులనిష్టతీ} = \frac{A}{B} \text{ లాభాలనిష్టతీ}$$

$$\frac{85,000 \times 4}{42500 \times x \text{ సంవత్సరమ}} = \frac{3}{1}$$

$x = 8 \text{ months.}$

36)

$$\frac{A}{B} \text{ పెట్టుబడులనిష్టతీ} = \frac{A}{B} \text{ లాభాలనిష్టతీ}$$

$$\frac{3500 \times 6}{x \times 4\text{ సంవత్సరమ}} = \frac{2}{3}$$

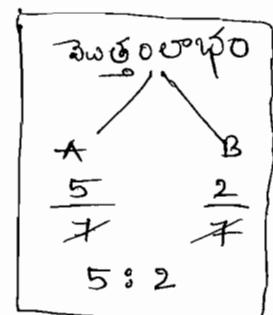
$x = 9000$

37)

$$\frac{A}{B} \text{ పెట్టుబడులనిష్టతీ} = \frac{A}{B} \text{ లాభాలనిష్టతీ}$$

$$\frac{3200 \times 2}{16000 \times 8\text{ సంవత్సరమ}} = \frac{5}{2}$$

$x = 12800$



38)

P	Q	R
$5x$	$6x$	$6x$

మార్గధర్మం	కాలో	1230	630
$5x$	$1230$	$123$	$630$

పెట్టుబడి  $60x + 72x + 36x$

$$168x = 490000 \times 12$$

$$\frac{1}{2}x = 490000$$

$$2x = 980000$$

$$x = 35000$$

$$\begin{aligned} R \text{ మాల్ఫ్రెన్ } &= 6x \\ &= 6 \times 35000 \\ &= 210000 \end{aligned}$$

$$20\% \text{ రూప్ } = 98,000$$

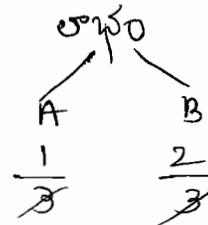
$$\frac{1}{5} \times 98000 = 98000$$

$$5\% \text{ రూప్ } = 98,000 \times 5$$

$$= 490,000$$

42

$$\begin{array}{ccc} A & & B \\ \frac{1}{4} & & \frac{3}{4} \\ 100 & 15 & x \end{array}$$



$$\frac{A}{B} \text{ రూప్ } = \frac{A}{B} \text{ రూప్ }$$

$$\frac{1 \times 15}{2 \times x} = \frac{1}{2}$$

$$x = 10 \text{ రూప్ }$$

39

పట్టించడినిష్ట్రీ = రాధాలనిష్ట్రీ

$$x : 14 : : 4 : 8 : 2 : 7 : 8$$

$$x : 4 : z = \left( \frac{5}{14} : \frac{1}{8} : \frac{8}{7} \right) \times 56$$

కొను  
56

$$= 20 : 49 : 64$$

40

$$\begin{array}{c} 100\% \text{ వెత్తం రాఘవ } \\ \swarrow 5\% \text{ కుట్టుక్కులు } \quad \searrow 95\% \\ \begin{array}{c} A : 3 : 2 \\ \frac{3}{5} \times 95 \\ = 57\% \end{array} \quad \begin{array}{c} B \\ \frac{2}{5} \times 95 \\ = 38\% \end{array} \end{array}$$



$$(A) 57\% \rightarrow 855$$

$$\text{వెత్తం } 100\% \rightarrow ? = \frac{100 \times 855}{57} = 1500$$

41

$$\frac{A}{B} \text{ రూప్ } = \frac{A}{B} \text{ రూప్ }$$

$$\frac{\frac{2}{14}x + \frac{2}{10}x}{\frac{2}{15}x} = \frac{7}{6}$$

$$x = 8$$

# CHAIN RULE

① 5 chocolates cost 25 Rs, 7 chocolates

Cost? (విలువ)

సంఖ్య కు

$$= \frac{\text{విలువ}}{\text{తక్కువ}} \times \text{విలువ}$$

$$= \frac{7}{5} \times 25 \text{ Rs} = 35 \text{ Rs.}$$

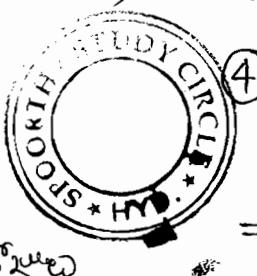
② 10 మంచినెప్పక్క 6 శైల్యాత్మణిల నుండి

15 మంచి వర్షాశైల్యమును చేసేదు? (తక్కువ)

మర్హంచంద  $\propto \frac{1}{\text{శైల్యము}}$

$$= \frac{\text{తక్కువ}}{\text{విలువ}} \times \text{విలువ}$$

$$= \frac{15}{10} \times \frac{2}{6} = 48 \text{ ము}$$



③ 60 km వీరంత్రిప్పక్క రఘ్యాన్ని చేరుటలు

30 గెంగపట్టతి, 45 km వీరంత్రిప్పక్క ఎంత

నమర్యం వచ్చుతుంది? (విలువ)

$$= \frac{\text{విలువ}}{\text{తక్కువ}} \times \text{విలువ}$$

$$= \frac{45}{60} \times \frac{10}{30} = 40 \text{ min.}$$

## R.S. Aggarwal Book

$$\begin{aligned} ① \quad x \text{ వీ } &\longrightarrow d \text{ రూ } \\ y \text{ వీ } &\longrightarrow ? = \frac{49}{x} \end{aligned}$$

$$\begin{aligned} ② \quad 6 \text{ రూ } &\longrightarrow 264.37 \text{ Rs} \\ 5 \text{ రూ } &\longrightarrow ? \text{ (తక్కువ)} \end{aligned}$$

$$= \frac{\text{తక్కువ}}{\text{విలువ}} \times \text{విలువ}$$

$$= \frac{5}{6} \times \frac{44}{264.37} = 220$$

$$③ \quad 357 \text{ వెట్ట } \longrightarrow 1517.25$$

$$49 \times 12 = 588 \text{ వెట్ట } \longrightarrow ? \text{ (విలువ)}$$

$$= \frac{\text{విలువ}}{\text{తక్కువ}} \times \text{విలువ}$$

$$= \frac{84}{588} \times \frac{89}{1517.25}$$

$$= \frac{357}{51} \times 17$$

$$= 28 \times 89$$

$$= 2492 \approx 2500$$

$$250 \text{ gm } \longrightarrow 60 \text{ paise}$$

$$200 \text{ gm } \longrightarrow ? \text{ (తక్కువ)}$$

$$= \frac{\text{తక్కువ}}{\text{విలువ}} \times \text{విలువ} \Rightarrow \frac{200}{250} \times \frac{12}{60}$$

$$= 48 \text{ paise}$$

⑤

$$11.25 \text{ m } \longrightarrow 42.75 \text{ kgs}$$

$$6 \text{ m } \longrightarrow ? \text{ (తక్కువ)}$$

$$= \frac{6}{11.25} \times 42.75 \Rightarrow \frac{6}{11.25} \times \frac{57}{45} \times 5$$

$$\Rightarrow \frac{114}{5} = 22.8$$

⑥

$$0.6 \text{ cm } \longrightarrow 6.6 \text{ km}$$

$$80.5 \text{ cm } \longrightarrow ? \text{ (విలువ)}$$

$$= \frac{\text{విలువ}}{\text{తక్కువ}} \times \text{విలువ}$$

$$= \frac{80.5}{0.6} \times \frac{11}{676}$$

$$= 885.5$$

7)  $0.128 \text{ m} \text{ --- } 1 \text{ sec}$   
 $25 \text{ m} \text{ --- ? (విధి)}$   
 $= \frac{\text{అ}}{\text{త}} \times \text{విధి} = \frac{25}{0.128} \times 1 \text{ sec}$   
 $= \frac{125}{25 \times 1000} = \frac{125}{128 \times 16}$   
 $= \frac{3125}{16} = 194 \approx 195$

8)  $\begin{array}{r} \text{అంతు} \\ \hline 17.5 \text{ m} \end{array} \quad \begin{array}{r} \text{వీళు} \\ \hline 40.25 \text{ m} \end{array}$   
 $\begin{array}{r} \text{నీట} \\ \hline 40.25 \text{ m} \end{array} \quad \begin{array}{r} \text{వీళు} \\ \hline 17.5 \text{ m} \end{array}$   
 $28.75 \text{ m} \quad ? (\text{తల్లి})$   
 $= \frac{\text{త}}{\text{అ}} \times \text{విధి} = \frac{28.75}{40.25} \times 17.5$   
 $= 12.5 \text{ m.}$

9) పరిమాణం  
 $\frac{5}{8} \text{ పరిమాణ} \text{ --- } 10 \text{ రోడుల}$

పరిమాణం  $= \frac{3}{8} \text{ పరిమాణ} \text{ --- ? (తల్లి)}$   
 $= \frac{\text{త}}{\text{అ}} \times \text{విధి} = \frac{3/8}{5/8} \times 10 = 6 \text{ రోడుల}$

10)  $36 \text{ వుండి} \text{ --- } 18 \text{ రోడుల}$   
 $27 \text{ వుండి} \text{ --- ? (విధి)}$

$= \frac{\text{అ}}{\text{త}} \times \text{విధి}$   
 $= \frac{36}{27} \times \frac{18}{31}$   
 $= 2.4 \text{ రోడుల}$

11) అసం  $150 \text{ మండి} \text{ --- } 45 \text{ రోడులను}$   
 $108 \text{ మండి} \text{ --- } 150 \text{ మండి} \text{? (విధి)}$   
 $25 \text{ మండి} \text{ వెళ్ళాచే?} \text{ --- } 125 \text{ మండి} \text{? (విధి)}$   
 $= \frac{\text{అ}}{\text{త}} \times 2 \Rightarrow \frac{150}{125} \times \frac{7}{5} = 42 \text{ రోడులు}$

12) పశ్చిమ లాభ్య  $(\text{అపసోషణ})$   
 $\begin{array}{r} \text{పశ్చిమ} \\ \hline 14 \end{array} \quad ? (\text{తల్లి})$   
 $\begin{array}{r} \text{బింబ} \\ \hline 6 \end{array} \quad 21 \text{ అపసోషణ}$

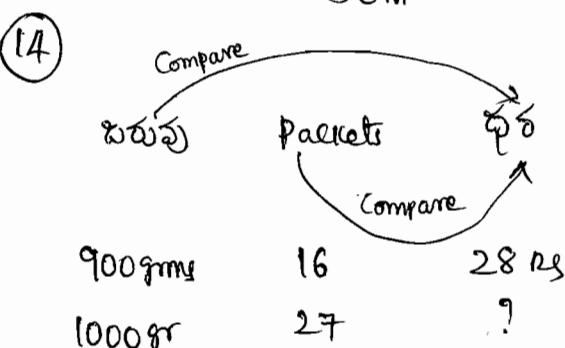
$= \frac{\text{త}}{\text{అ}} \times 9 \Rightarrow \frac{36}{14} \times \frac{3}{21} = 9$

13)  $\frac{3}{120} \text{ m} = \frac{5}{200} \text{ C}$   
 $3 \text{ m} = 5 \text{ C}$

$\text{మాత్రం ఫోటోసో} = 200 \text{ C}$

$\text{తీవ్ర సారు} = 150 \text{ C}$

$\begin{array}{r} \text{మాగతా} \\ \hline 50 \end{array} \quad = 50 \text{ C}$   
 $= 10 \times 5 \text{ C}$   
 $= 10 \times 3 \text{ m}$   
 $= 30 \text{ m}$



① బింబ - చూరు (బింబపై నిరీక్షి, చూరు పై వుసుటుంది) (విధి)

② Pocket చూరు (Pocket పై నిరీక్షి, చూరు పై వుసుటుంది) (విధి)

$$\frac{\text{అ}}{\text{త}} \times 8 = \frac{1000}{900} \times \frac{3}{16} \times 28 \text{ Rs.}$$
 $= \frac{105}{2} = 52.5$

Compare

(15) మంది      రోడులు      చూపాలు

4	4	4
8	8	?

$$= \frac{2}{4} \times \frac{2}{4} \times 4 \Rightarrow 16$$

(16) విధీనసంఖ్యలు      కొత్తాలు      నీటిలు

6	19	270
10	49	?

$$= \frac{10}{6} \times \frac{2}{1} \times 270 \Rightarrow 1800$$

(17) ప్రశ్నలు      ఎక్షామ      త్రయిలు

40	40	40
1	1	?

$$= \frac{40}{1} \times \frac{1}{40} \times 40 \Rightarrow 40 \text{ రూపాలు.}$$

(18) గంచిలు      రోడులు      మంది

8	10	12
15	8	?

$$= \frac{8}{15} \times \frac{2}{8} \times 12 = 8$$

(19) మంది      రోడులు      గంచిలు

10	18	6
15	12	?

$$= \frac{10}{15} \times \frac{18}{12} \times 6 = 6 \text{ రూపాలు.}$$

(20) మంది      గంచిలు      రోడులు

39	5	12
630	6	?

$$\frac{13}{30} \times \frac{5}{6} \times 12 \Rightarrow 13 \text{ రూపాలు.}$$

(21) పంచాలు      రోడులు      వాయిద

3	1	8
4	1	?

$$= \frac{3}{4} \times \frac{2}{1} \times \frac{4}{8} \Rightarrow 12 \text{ రూపాలు.}$$

(22) మంది      రోడులు      వాయిద

8	24	80
36	30	?

$$= \frac{36}{8} \times \frac{30}{24} \times 80 = 450$$

(23) రోడులు      లోకు      వెదురు      పాండిలు

10	10m	50m	100m
30	15	20	?

$$= \frac{30}{10} \times \frac{10}{15} \times \frac{50}{20} \times 100 = 500$$

24

$$5m = 9w$$

$$m = \frac{9}{5} w$$

$$= 3m + 6w$$

Question 9 men/women ఏటి వ్యవహరించి

$$= 3\left(\frac{9w}{5}\right) + 6w$$

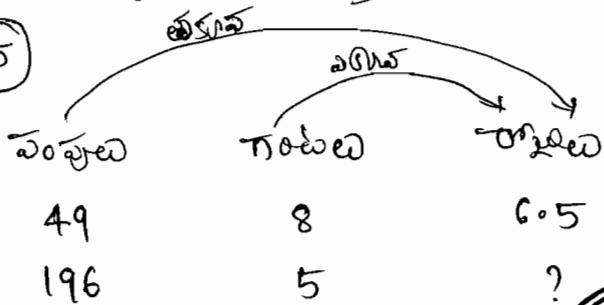
$$= \frac{27w + 30w}{5} = \frac{57w}{5} = 11.4w$$

$$9w \text{ --- } 19 \text{ days}$$

$$11.4w \text{ --- ? (తప్పనిస్తున్నా)$$

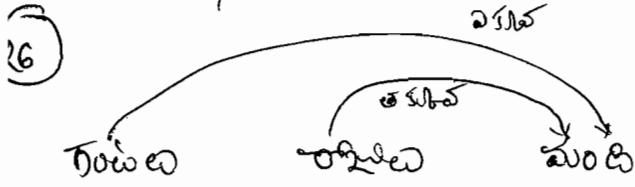
$$\frac{9}{11.4w} \times 19 \Rightarrow \frac{90}{6} = 15$$

25



$$= \frac{49}{196} \times \frac{2}{5} \times 6.5$$

$$= 2.6 / 2 \frac{3}{5}$$



$$\times \frac{7}{6} \times \frac{18}{30} \times 30$$

$$= 21 \text{ వ్యాపి. వ్యాపి}$$

(OR)

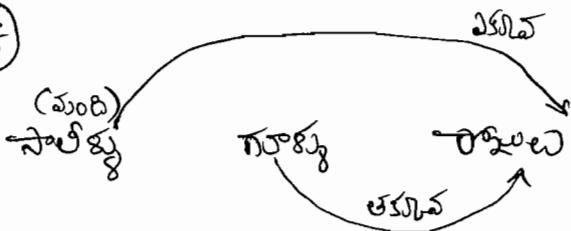
$$P \propto \frac{1}{dh}$$

$$P_1 d_1 h_1 = P_2 d_2 h_2$$

$$30 \times 18 \times 7 = P_2 \times 30 \times 6$$

$$P_2 = 21 \text{ వ్యాపి.}$$

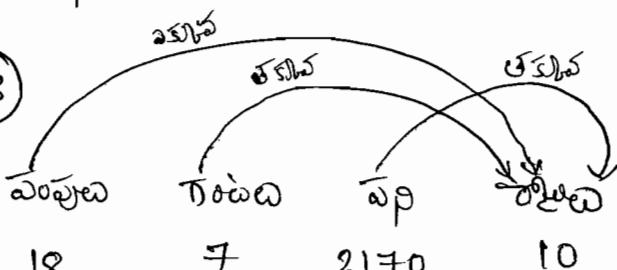
27



$$= \frac{7}{1} \times \frac{1}{7} \times 7 -$$

$$= 7$$

28



$$16 \quad 9 \quad 1736 \quad ?$$

~~P  $\propto \frac{1}{dh}$~~ 

$$= \frac{18}{16} \times \frac{7}{9} \times \frac{1736}{2170} \times 10$$

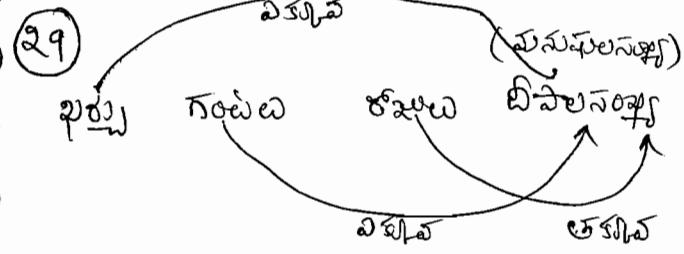
$$= 7 \text{ ఎర్రమెణ్టలు}$$

(OR)

$$\frac{P_1 d_1 h_1}{w_1} = \frac{P_2 d_2 h_2}{w_2}$$

$$\frac{18 \times 10 \times 7}{2170} = \frac{16 \times d_2 \times 9}{1736}$$

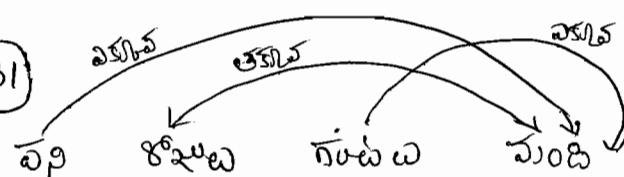
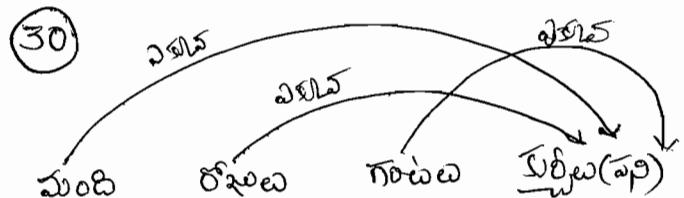
$$= 7 \text{ ఎర్రమెణ్టలు.}$$



$$21.25 \quad 5 \quad 10 \quad 80$$

$$\begin{aligned} & \frac{21.25}{76.50} \times \frac{5}{4} \times \frac{10}{30} \times \frac{4}{80} \\ & \frac{21.25}{4.25} \times \frac{5}{1} \times \frac{10}{3} \times \frac{4}{8} \\ & 0.85 \end{aligned}$$

$$= 30 \times 4 \Rightarrow 120 \text{ ohms}$$



$$\frac{1}{4} \quad 10 \quad 9 \quad 400$$

$$\begin{aligned} & \frac{3}{1} \times \frac{10}{20} \times \frac{9}{8} \times \frac{25}{400} \\ & = 25 \times 3 \Rightarrow 675 \end{aligned}$$

$$\text{अधन्य} = 675 - 400 = 275.$$

(OR)

$$\frac{P_1 d_1 h_1}{w_1} = \frac{P_2 d_2 h_2}{w_2}$$

$$\frac{400 \times 10 \times 9}{\frac{1}{4}} = \frac{(400+x) \times 20 \times 8}{\frac{3}{4}}$$

$$25 \times 9 \times 3 = 400+x$$

$$675 = 400+x$$

$$x = 275$$

32

$$12 \quad 1 \quad 9 \quad 5$$

$$30 \quad 2 \quad 4 \quad ?$$

$$= \frac{12}{30} \times \frac{2}{1} \times \frac{9}{4} \times 5$$

$$= 9$$

33

$$20 \quad 18 \quad 8 \quad 17$$

$$39 \quad 6 \quad 9 \quad ? (\text{अधन्य})$$

$$= \frac{3}{20} \times \frac{18}{6} \times \frac{4}{9} \times 17$$

$$= 68$$

$$\text{अधन्य} = 68 - 17 = 51$$

(OR)

$$\frac{P_1 d_1 h_1}{w_1} = \frac{P_2 d_2 h_2}{w_2}$$

34

$$\frac{1}{20} \quad \frac{2}{1} \quad \frac{20}{?}$$

$$= \frac{1}{20} \times \frac{2}{1} \times \frac{4}{20}$$

$$= 32$$

$$\text{अधन्य} = 32 - 20 = 12$$

(OR)

$$\frac{P_1 d_1 h_1}{w_1} = \frac{P_2 d_2 h_2}{w_2}$$

$$\frac{20 \times 20}{\frac{1}{3}} = \frac{P_2 \times 25}{\frac{2}{3}}$$

$$= 32 - 20 = 12$$

35) తక్కువ తగ్గు వుండి

రోస్టర్	వరి	వుండి
10	900	18
12	600	?

$$= \frac{10}{12} \times \frac{600}{900} \times 18$$

$$= 110 \quad \text{(Q)}$$

$$= \frac{P_1 d_1}{\omega_1} = \frac{P_2 d_2}{\omega_2}$$

$$= \frac{10 \times 18}{900} = \frac{P_2 \times 12}{660}$$

$$P_2 = 11$$

36) వరి డాల్మా

$\frac{3}{5}$	$1p = 60 \text{ sec}$
$\frac{2}{5}$	?

$$= \frac{2}{3} \times 60 = 40 \text{ sec}$$



37)  $\frac{P_1 d_1 h_1}{\omega_1} = \frac{P_2 d_2 h_2}{\omega_2}$

$$\frac{x \times x \times x}{x} = \frac{4 \times 4 \times 4}{w_2}$$

$$w_2 = \frac{4^3}{x^2} \text{ Units}$$

38) నంబు (round) = ప్రతీవరషి =  $2\pi r$

ప్రతీవరషి/వరషి

తగ్గు	నంబు
14 cm	70
20 cm	?

$$= \frac{14}{20} \times 70 = 49 \text{ seconds.}$$

39) ఇంజన్స్ రంచి ఇంధనం

ఇంజన్స్	రంచి	ఇంధనం
5 దిశలు	9	6
(8 లు)	10	?

ప్రశ్నా మనంపై ఇంజన్స్ ప్రాయస్తున్నాయి  
(3 దిశలు = 4 లు)  $\times 2$

$$6 \text{ దిశలు} = 8 \text{ లు}$$

$$= \frac{2}{5} \times \frac{10}{9} \times 8$$

$$= 8$$

40) Group 1                          Group 2

$$2m = 1 \text{ hour}$$

$$1 \text{ man capacity} = \frac{1}{2} = 50\% \quad | \quad 1 \text{ mn Cpty} = \frac{1}{3}$$

వరి	Capacity	రంచి
1	$\frac{1}{2} = 50\%$	25
2	$\frac{1}{3} = 33.33\%$	?

$$= \frac{2}{1} \times \frac{1}{\frac{1}{3}} \times 25 = 75$$

41) వరి వుండి రోస్టర్

వరి	వుండి	రోస్టర్
1	x	12
$\frac{1}{2}$	$2x$	?

$$= \frac{1/2}{1} \times \frac{x}{2x} \times 12$$

$$= 3$$

42) రోస్టర్ వుండి

రోస్టర్	వుండి
100	x
110 ?	$x - 10$

$$\frac{x}{x-10} \times 100 = 110$$

$$10x = 11x - 110$$

$$x = 110$$

**OR**

$$P_1 d_1 = P_2 d_2$$

$$x \times 10d = (x-10) \times 11d$$

$$10x = 11x - 110$$

$$x = 110$$

**(43)**

మెత్తా	95 men	200 days
అన్నింటి	95m	5d

విగిలనింపి	95m	195d
	65m	?

$$= \frac{95}{65} \times \frac{3}{195}$$

$$= 285$$

**OR**



$$\text{మెత్తా ప్రథమ} = 95m \quad 200d = 95m \times 200d$$

$$58\text{॥}5 = 95m \quad 5d = 95m \times 5d$$

$$\text{విగిలన} \quad 95 \times 195d$$

**(44)**

మెత్తా	500 మంది	27 రోజులు
38\  అర్థాత్	500 మంది	38 రోజులు
విగిలన	500 మంది	24 రోజులు

$$= \frac{500}{800} \times \frac{3}{24}$$

$$= 158\text{॥}$$

మెత్తా	x	y
108\  అర్థాత్	x	108\
విగిలన	x	(y-10) 8\

$\frac{1}{5}$  మంది వ్యక్తి ప్రతి  $\frac{4}{5}$  మంది — లేదా

మందు వర్షార్థమై ఉపాయమ్రాద అన్నిరోజులు

$$\left( \frac{x}{4x} \right) \times (y-10) = y$$

$$5y - 50 = 4y$$

$$y = 50$$

**(46)**

మంది	గొప్పాడు	చాల్సెచ్
15 m	8	21
14 m	6	?

Women లోకి కొనండా men  
ఎక్కి వ్యాప్తి.

$$(2m = 3w) \times 7$$

$$14m = 21w$$

**(47)**

మంది	గొప్పాడు
x	9
(x-6)	15

$$P_1 d_1 = P_2 d_2$$

$$x \times \frac{3}{9} = (x-6) \times \frac{5}{15}$$

$$3x = 5x - 30$$

$$2x = 30$$

$$x = 15$$

**(48)**

$$\text{మెత్తా ప్రథమ} = 100m \times 35d + 200m \times 5d = 4500md$$

(OR)

$$= 100m \times 40d + 100m \times 5d = 4500md$$

న్రవీళ extra 100 మందిగా }  
తీసుకోవాలి—చూటి }

$$\text{Days} = \frac{\text{men days}}{\text{Men}} = \frac{4500md}{100m}$$

$$= 45 \text{ days}$$

Expected = 40 days

58\| డాస్‌స్టో

49) expected =  $(38 \text{ days})$

$$\begin{aligned} \text{మొత్తం ఏర్పాతి} &= 30\text{m} \times 25\text{d} + 35\text{m} \times 12\text{d} \\ &= 750\text{md} + 420\text{md} \\ &= 1170\text{md} \end{aligned}$$

$$\text{అధినియమితుల వర్షాపత్రి} = \frac{1170\text{ md}}{30\text{ m}} = 39 \text{ days}$$

50)

వుండి	గోళాలు	గుణాలు	ఏర్పాతి
<del>12m+18b</del>	60	7.5	1
$24b+18b =$			$2b = 1 \text{ m}$
$42 \text{ boys}$			$\begin{array}{l} ① \times 12 = \\ 24b = 12 \text{ m} \end{array}$

వుండి	గోళాలు	గుణాలు	ఏర్పాతి
<del>xm+xb</del>	50	9	2
$42b+xb =$			$42b = 21 \text{ m}$
$(42+n)b$			

$$\frac{P_1 d_1 h_1}{w_1} = \frac{P_2 d_2 h_2}{w_2}$$

$$\frac{\frac{14}{1} \times 60 \times 7.5}{1} = \frac{(42+n) \times 50 \times 9}{2}$$

$$= 84 = 42+n$$

$$n = 42$$

51)

వుండి	గోళాలు	గుణాలు	ఏర్పాతి	
$3m+6b$	10	7	1	$3m = 6b$
$6m + \cancel{2b}$	?	8	2	$1m = 2b$
$6m+m = 7m$				

$$\frac{P_1 d_1 h_1}{w_1} = \frac{P_2 d_2 h_2}{w_2}$$

$$\frac{3 \times 10 \times 1}{1} = \frac{7 \times d_2 \times 8}{x}$$

$$d_2 = \frac{15}{2} = 7 \frac{1}{2}$$

52)

వుండి	గోళాలు	మొత్తం ఏర్పాతి
$2m+7b$	14	$28m+98b$
$3m+8b$	11	$33m+88b$
$8m+6b$	?	

(3 works)

$$\rightarrow 4b+7b \rightarrow 14$$

$$11b \rightarrow 14$$

$$\rightarrow 16b+6b \rightarrow ?$$

$$22b \rightarrow ?$$

$$P_1 d_1 = P_2 d_2$$

$$11 \times 14 = 22 \times d_2$$

$$d_2 = 7$$

$$\begin{aligned} 28m+98 &= 33m+88b \\ 5m &= 10b \\ 1m &= 2b \end{aligned}$$

$$38 \text{ దినాలు} = 7 \times 3 = 21 \text{ days.}$$



# AGES

$$\text{①} \quad \begin{array}{ccccc} & A & & B & \\ \text{అన్నతి} & x & & y & \text{తేదు} \\ & & & & x-y \end{array}$$

$$\text{10 సంవత్సరమైన వయసు} \quad x+10 \quad y+10 \quad x-y$$

$$5 \text{ సంవత్సరమైన వయసు} \quad x-5 \quad y-5 \quad x-y$$

\* ఏ ఇచ్చడాలన్న వయసుల తేదు ఎవ్వాడో  
నీ పిలవ రథి-శింటంది. అనగా పారకు.

$$\text{①} \quad S : R = ? : 9 \\ 2 \rightarrow 4 \text{ సంవత్సరమైన} \\ 2 \rightarrow ? = \frac{7 \times 4}{x} = 14 \text{ సంవత్సరమైన}$$



$$\text{②} \quad \text{అన్నతి } P : Q = 6 : 7 \quad \text{తేదు } 1 \text{ సంవత్సరమైన}$$

$$1 \rightarrow 4 \text{ సంవత్సరమైన} \quad | \quad 1 \xrightarrow{\times 4} 4 \text{ సంవత్సరమైన} \\ P \quad 6 \xrightarrow{\times 4} 24 \text{ సంవత్సరమైన} \quad | \quad Q \quad 7 \xrightarrow{\times 4} 28 \text{ సంవత్సరమైన}$$

4 సంవత్సరమైన వయసు

$$P : Q = (24+4) : (28+4) \\ = 28 : 32 \\ = 7 : 8$$

$$\text{③} \quad P : Q = 5 : 7$$

$$\begin{array}{ccc} \text{అన్నతి వయసు} & 5x & P \\ 6 \text{ సంవత్సరమైన వయసు} & 5x+6 & 7x \\ & & 7x - (5x+6) = 2 \\ & & 2x = 8 \\ & & x = 4 \end{array}$$

$$\begin{aligned} \text{వయసు మొత్తము} &= 5x + 7x \\ &= 12x \\ &= 12(4) \\ &= 48 \text{ సంవత్సరమైన} \end{aligned}$$

$$\text{④} \quad A : D = 4 : 3$$

$$\begin{array}{ccc} \text{అన్నతి} & 4x & 3x \end{array}$$

$$6 \text{ సంవత్సరమైన వయసు} \quad 4x+6 \quad 3x+6$$

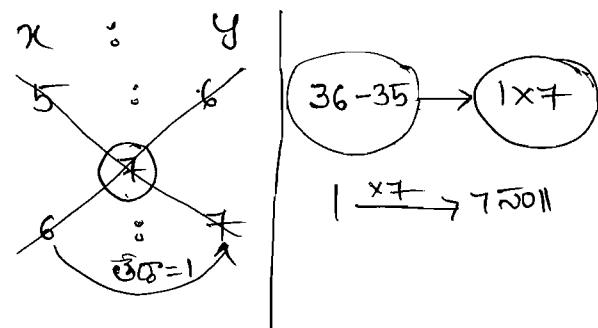
$$A + 6 = 4x+6 = 26$$

$$4x = 20$$

$$x = 5$$

$$D \text{ అన్నతి వయసు} = 3(x) = 3(5) = 15 \text{ సంవత్సరమైన}$$

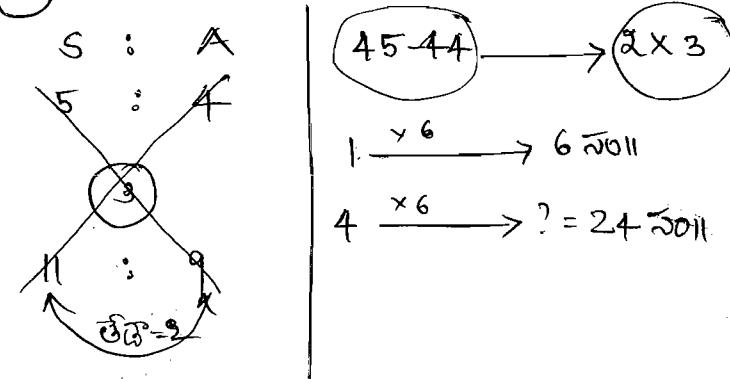
⑤



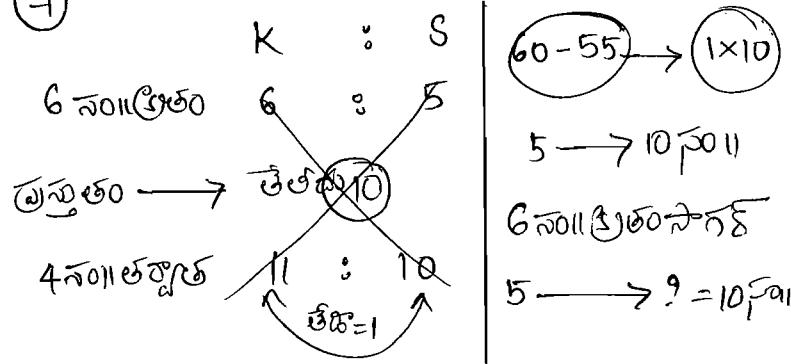
$$5 \xrightarrow{x} ? = 35 \text{ సంవత్సరమైన}$$

$$6 \xrightarrow{x} ? = 42 \text{ సంవత్సరమైన}$$

⑥



⑦



$$\text{అన్నతి} = 10+6 = 16 \text{ సంవత్సరమైన}$$

⑧

8) 10 సంఖ్యల జిఃపః :  $S = 2 : 3 : 4$   
 $2x, 3x, 4x$

కుటుంబం =  $2x+10, 3x+10, 4x+10$

$2x+10 + 3x+10 + 4x+10 = 93$

$9x = 93 - 30$

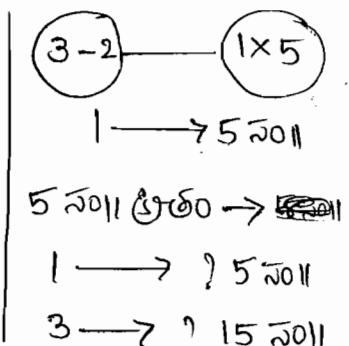
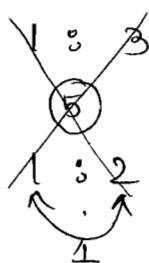
~~$x$~~  =  $\frac{63}{9}$

$x = 7$

కుటుంబం Saranam వయస్సు =  $4x+10$   
 $= 4 \times 7 + 10$   
 $= 38$

9)

5 సంఖ్యల కుటుంబం



5 సంఖ్యల కుటుంబం  $A:B = 5+10 : 15+10$   
 $= 15 : 25$   
 $3 \quad 5$   
 $= 3 : 5$

10)

కుటుంబం 40 yrs, 60 yrs,  
 $x$  సంఖ్యల కుటుంబం

$\frac{H}{R} = \frac{40-x}{60-x} \times \frac{3}{5}$

$200 - 5x = 180 - 3x$

$2x = 20$

$x = 10$

11)

Father : Son =  $7 : 3$   
 $7x \quad 3x$   
 $36$

వారంభం =  $7x \times 3x = \frac{108}{756}$

$x^2 = 36$

$x = 6$

కుటుంబం  $F, S = 7 \times 6, 3 \times 6$   
 $= 42, 18$

6 సంఖ్యల కుటుంబం  $F:S = 42+6 : 18+6$   
 $= 48 : 24$   
 $2 : 1$

12)

కుటుంబం వయస్సు =  $4 : 7 : 9$   
 $4x, 7x, 9x$

8 సంఖ్యల కుటుంబం  $4x-8, 7x-8, 9x-8$

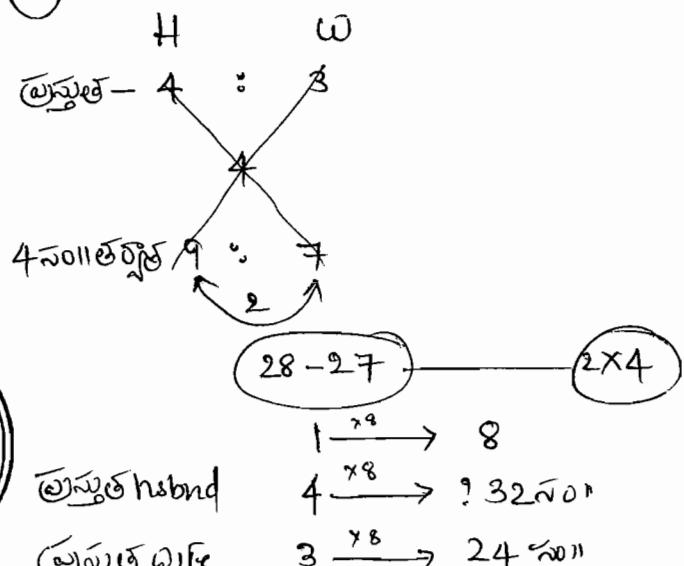
$4x+7x+9x-8-8-8 = 56$

$20x = 80$

$x = 4$

కుటుంబం వయస్సు =  $4x, 7x, 9x$   
 $= 16, 28, 36$

13)



కుటుంబం hubnd  $1 \xrightarrow{x^2} 8$

కుటుంబం wife  $4 \xrightarrow{x^8} 32 \text{ సంఖ్యల}$

$x$  సంఖ్యల కుటుంబం  $3 \xrightarrow{x^8} 24 \text{ సంఖ్యల}$

$\frac{H}{W} = \frac{32-x}{24-x} \times \frac{5}{3}$

$96 - 3x = 120 - 5x$

$2x = 24$

$x = 12$

14)

School Age

$N:S = 5:6$   
 $5x, 6x$

$$\frac{N}{S} = \frac{\frac{1}{3} \times 5x}{\frac{1}{2} \times 6x} = \frac{5}{9}$$

Cannot be determine

15)  $A : B$

అనుపత్తి  $5 : 3$

అనుపయని  $5x : 3x$

4 సార్లు  $4 \text{ సార్లు తరువాత}$

$5x - 4 : 3x + 4$

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

$5x - 4 = 3x + 4$

$2x = 8$

$x = 4$

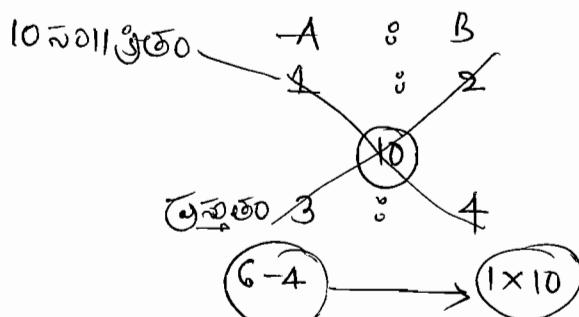
4 సార్లు తరువాత  $4 \text{ సార్లు తరువాత}$

$= 5x + 4 : 3x - 4$

$= 5(4) + 4 : 3(4) - 4$

$= 24 : 8$   $\therefore$  3 : 1

16)  $A = \frac{B}{2} \Rightarrow \frac{A}{B} = \frac{1}{2}, A : B = 1 : 2$



10 సార్లు తరువాత  $\left\{ \begin{array}{l} A \\ B \end{array} \right. \begin{array}{l} \xrightarrow{\times 5} 10 \\ \xrightarrow{\times 5} 5 \end{array}$

అనుపయని  $= 5+0, 10+10$   
 $= 15, 20$

మొత్తం  $= 35 \text{ సార్లు}$

17) ఎన్నా వయసు  $A : B : C$

$2x+2 : 2x : x$

మొత్తం  $= 2x+2 + 2x + x = 27$

$5x = 25$

$x = 5$

B వయస్సు  $= 2x = 2(5) \Rightarrow 10 \text{ సార్లు}$

18) Father : Son

అనుపత్తి  $x+24 : x$

2 సార్లు తరువాత  $x+26 : x+2$  రచ్చిపోవాలి

$x+26 = 2(x+2)$

$x+26 = 2x+4$

అనుపత్తి రాశి  $x = 22$

19) Father : Son

18 సార్లు తరువాత — 3 : 1

అనుపత్తి — 2 : 1  $\therefore$  తేడా = 1

$$18 \text{ సార్లు తరువాత వయస్సు } = \frac{3 \times 18 \times 1}{1} \quad \left| \frac{1 \times 18 \times 1}{1} \right.$$

$$= 54 \quad = 18$$

$$\text{అనుపత్తి } + 18 \quad + 18$$

$$72 \quad 36$$

మొత్తం  $= 72 + 36 \Rightarrow 108$

20)  $\text{son} = \frac{2}{5} \text{ mother}$

$\frac{\text{son}}{\text{mother}} = \frac{2}{5}$

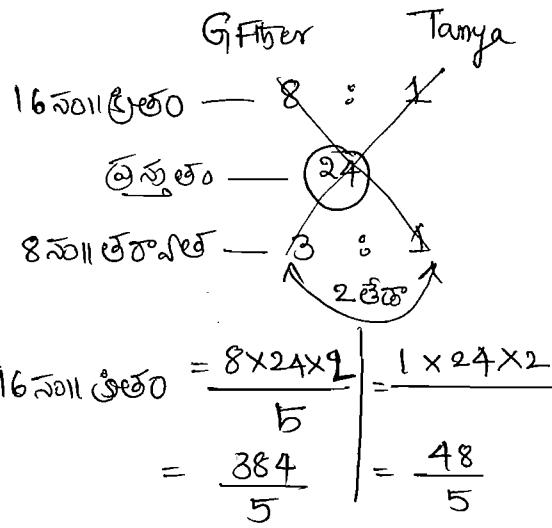
అనుపత్తి Son : mother

$= \frac{5 \times 8 \times 1}{1}$

$= 40 \text{ సార్లు}$

8 సార్లు తరువాత  $\begin{matrix} 2 & 1 \\ 1 & 2 \end{matrix} : \begin{matrix} 5 & 2 \\ 2 & 5 \end{matrix}$

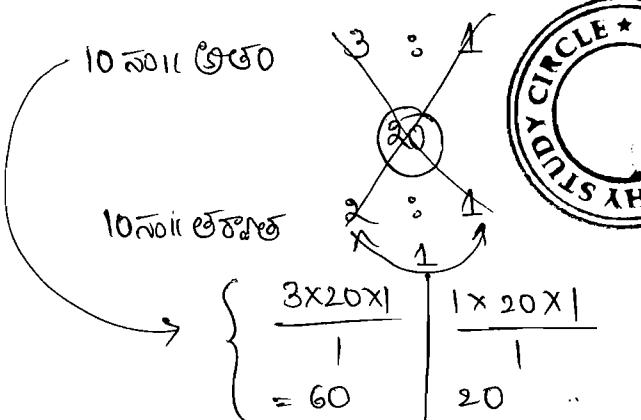
2)



$$\begin{aligned} 8 \text{ sons || Total} &= \frac{384}{5} + 8 : \frac{48}{5} + 8 \\ &= 384 + 40 : 48 + 40 \\ &= \frac{53}{494} : \frac{88}{88} \\ &= 53 : 11 \end{aligned}$$

22)

Father : Son



$$\begin{aligned} \text{Total} F:S &= 60 + 10 : 20 + 10 \\ &= 70 : 30 \\ &= 7 : 3 \end{aligned}$$

(3) 4 sons || Father and 6 sons || Mother have 10 children in total.  
How many sons? 4 sons || Father and 6 sons || Mother have 10 children in total.  
Total 64. Total sons = ?

$$\begin{array}{rcl} \text{Father} & : & \text{Son} \\ 3 & : & 1 \\ 4 \text{ sons || Father} & 3x & 1x \end{array}$$

$$\text{Total} \quad 3x+4 \quad x+4$$

$$\text{Total} \quad 3x+4 \quad x+4$$

?

$$4 \text{ sons || Mother} \quad 3x+8 \quad x+8$$

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

$$4x = 48$$

$$x = 12$$

$$\text{Total} \quad 3x+4 = 3(12)+4 \Rightarrow 40 \text{ sons || Mother}$$

(24) 24 sons || Father Promila has 12 sons and 12 daughters.

Promila has 4 sons and 6 daughters. 6 daughters are Promila's daughters, and the remaining 6 are her mother's daughters. Promila has 12 sons and 12 daughters. How many sons does Promila have?

$$\begin{array}{rcl} \text{Promila} & : & \text{Sakshi} \\ 1 \text{ son || Father} & - & 4 \\ & & 3 \\ & & 1 \end{array}$$

$$\begin{array}{l} 6 \text{ sons || Daughter} = 9 \text{ sons ||} \\ \text{Promila's daughter} \text{ is Sakshi's mother} \end{array}$$

$$\begin{array}{rcl} 3 & \xrightarrow{\times 3} & 9 \text{ sons ||} \\ P \quad 4 & \xrightarrow{\times 3} & 12 \text{ sons ||} \\ S \quad 1 & \xrightarrow{\times 3} & 3 \text{ sons ||} \\ \text{Total} & = 12+1 & : 3+1 \\ & = 13 & : 4 \end{array}$$

25)

$$\begin{array}{rcl} \text{father} & : & \text{son} \\ 6 \text{ sons || Father} & 5 & : 1 \\ & 5x & 1x \end{array}$$

$$\begin{array}{rcl} \text{Total} & = 5x+6 & : x+6 \\ & = 5(8)+6 & : 8+6 \\ & = 46 & : 14 \end{array}$$

$$\begin{array}{l} 5x+6+x+6=60 \\ 6x=48 \\ x=8 \end{array}$$

$$\begin{array}{rcl} 6 \text{ sons || Mother} & & \\ & & \frac{20}{20} \end{array}$$

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

$$6x=48$$

$$x=8$$



$$(A+B) - (B+C) = 12 \text{ సార్లల}$$

~~$$A+B-B+C = 12$$~~

$$A-C = 12$$



$$R-Q = Q-T$$

$$2Q = R+T$$

~~$$2Q = 50$$~~

$$Q = 25$$

$$R+T = 50$$

$$R-Q = ?$$

Data insufficient.

28 Father : Son<sub>1</sub>+Son<sub>2</sub>

$$3 : 1$$

$$\text{అస్తిత్వం } 3x$$

$$5 \text{ సార్లలకు } 3x+5$$

$$\begin{array}{r} 3x+5 \\ \times 2 \\ \hline x+10 \end{array}$$

$$3x+5 = 2x+20$$

$$x = 15$$

$$\text{తండ్రిఅస్తిత్వం} = 3x = 3(15) = 45 \text{ సార్లల}$$

29 Father Son  
(అస్తిత్వం)  $x$   $y$   $x+y=45$

$$5 \text{ సార్లలకు } (x-5) (y-5) (x-5)(y-5)=34$$

Gowtho options  $\frac{1^{\text{st}}}{\text{ }} \quad \frac{2^{\text{nd}}}{\text{ }}$

$$\textcircled{A} \ 6, 39 \quad \checkmark \quad \checkmark 1 \times 34 = 34$$

$$\textcircled{B} \ 7, 38$$

$$\textcircled{C} \ 9, 36$$

$$\textcircled{D} \ 11, 34$$

30 రహిత అస్తిత్వమైనా =  $x \text{ సార్లల}$   
రహిత వాళ్ళ లేదా  $= (x-8) \text{ సార్లల}$

$$x = \frac{6}{5}(x-8)$$

$$5x = 6x - 48$$

$$\text{రహిత అస్తిత్వమైనా} = x = 48$$

$$\text{రహిత వాళ్ళ అస్తిత్వమైనా} = 48 - 10 = 38 \text{ సార్లల}$$

ఎవరి ఇచ్ఛల్లిద్దనా వయస్సు తేడా కీర్తి శాఖలో ఉండును. \*Imp

31 5 సార్ల పిల్లల వయస్సు

$$x-6, x-3, x, x+3, x+6$$

$$x-6 + x-3 + x + x+3 + x+6 = 50$$

$$5x = 50$$

$$x = 10$$

$$x-6 = 10-6 = 4 \text{ సార్లల}$$

Father : Rohit

అస్తిత్వం 4 : 1

$$4x \quad 1x$$

$$8 \text{ సార్లలకు } 4x+8 \quad x+8$$

ఇంకా 8 సార్లలకు  $4x+16 \quad x+16$

$$4(8)+16 = 8+16$$

$$48 : 24$$

$$2 : 1$$

$$\text{Father} = 2 \frac{1}{2} \text{ Rohit}$$

$$F = \frac{5}{2} \text{ Rohit}$$

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

$$8x+16 = 5x+40$$

$$3x = 24$$

$$x = 8$$

\textcircled{A} Right Answer

33

15 సా॥ త్రితు

వెద్దవాడు నీమహాత్మ

$$\begin{array}{c} 2 \\ \times \\ 1 \end{array} \quad : \quad \begin{array}{c} 1 \\ \times \\ 1 \end{array}$$

$\text{Age Gap} = 10 \text{ సా॥}$

$$| \longrightarrow 10 \text{ సా॥}$$

$$20 \text{ సా॥} \longrightarrow 10 \text{ సా॥}$$

$$\begin{array}{r} \text{బ్రాతు} + 15 \\ \hline 35 \text{ సా॥} \end{array}$$

34

కొడుకు తల్లుత వయస్సు =  $x$  సా॥కొడుకు పుట్టినపుడు తుట్టివయస్సు =  $38 - x$ 

$$38 - x = x$$

$$2x = 38$$

$$\text{కొడుకు తల్లుత} - x = 19 \text{ సా॥}$$

$$5 \text{ సా॥ త్రితు} = 19 - 5 = 14 \text{ సా॥}$$

35

$$\begin{array}{c} \swarrow 9 \text{ సా॥} \uparrow \searrow \\ A \qquad \qquad \qquad B \end{array}$$

తల్లుత $x+9$	$x$
$10 \text{ సా॥ తర్వాత}$ = $x+9+10$ = $x+19$	$10 \text{ సా॥ త్రితు}$ $x-10$

$10 \text{ సా॥ తర్వాత}) = 10 \text{ సా॥ త్రితు}$

$A = 2 \times B$

$$x+19 = 2(x-10)$$

$$x+19 = 2x-20$$

$$x = 39$$

36

విమల్ 2 సా॥ త్రితు = 8<sup>th</sup> Birthday

విమల్ తల్లుత వయస్సు = 10 yrs.

10 సా॥ తర్వాత విమల్ వయస్సు = 20 yrs.

10 సా॥ || స్నేహ తుట్టివయస్సు = 40 yrs.

తల్లుత స్నేహతుట్టివయస్సు = 30 yrs.

$$\cdot \quad \text{స్నేహ} = \frac{1}{6} \times \text{తుట్టి}$$

$$= \frac{1}{6} \times 30$$

$$= 5 \text{ సా॥}$$

37

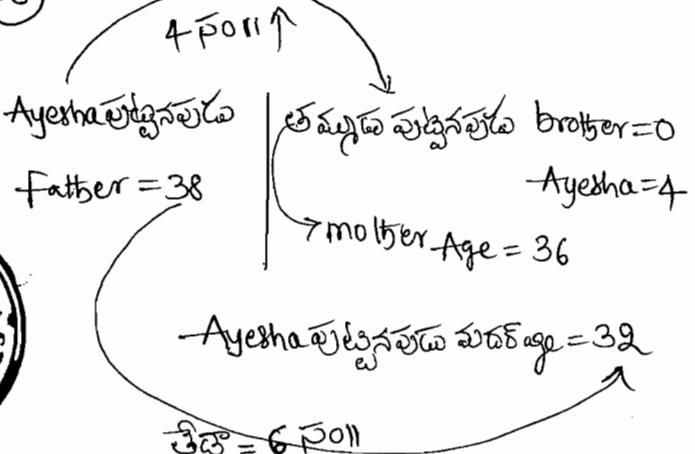
 $\text{Madan} = 5 \text{ yrs.}$  $\text{Anup} = 5-2 = 3 \text{ yrs.}$  $\text{Gagan} = x \text{ సా॥}$ 

$$\frac{x-6}{18} = 3$$

$$x-6 = 54$$

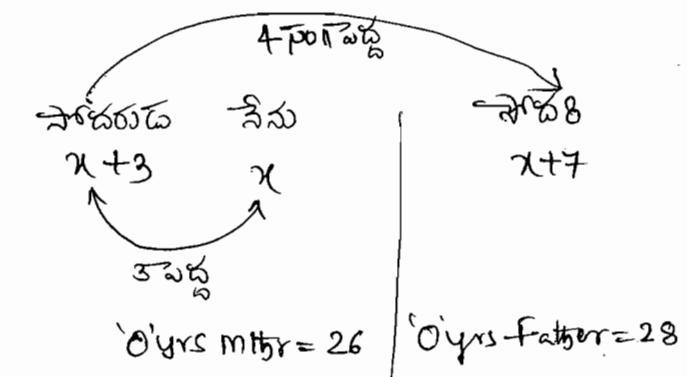
$$x = 60$$

38



39

నాశోదయడు నాశోది 3 సా॥ వెద్దవాడు. నాశోది ద్వారా లుట్టినపుడు నాతల్లు వయస్సు 28 సా॥. సీను లుట్టి నపుడు నాతల్లు వయస్సు 26 సా॥. నాశోదయడు లుట్టి నపుడు నాశోదికి 4 సా॥ వయస్సు. నాశోదయడు లుట్టినపుడు తల్లు, తండ్రి వయస్సులు వయసగా..?



$$\text{సీఎచ్ వాడు లుట్టినపుడు } F = 28 + 4 = 32$$

$$|| \qquad \qquad \qquad m = 26 - 3 = 23$$

$$(40) \quad 3 \text{ సా॥ త్రితు} (x-3)^3 \cdot | \quad \text{తల్లుత} = x$$

$$3 \text{ సా॥ తర్వాత} (x+3)^3$$

$$3(x+3) - 3(x-3) = 36$$

$$3x+9 - 3x+9 = x$$

$$x = 18$$

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**ARITHMETIC**  
**(R.S. AGGARWAL)**  
**BOOK (BIT TO BIT)**  
BY  
**విజయ్ సాగర్** sir,  
IIT, Kharagpur



**40 Days Batch**  
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**6303450967**

R S Agarwal Bit to Bit by Sagar Sir @Spoorthy Ashok Nagar- 6303450967



# NUMBER SYSTEM

I. ನಿರ್ದಿಷ್ಟನಾಮಿ-ದೊಡ್ಡ ಪ್ರಾಯ :-

$$1. 21 \times 43 \times 67 \times 93 \times 47 = 1$$

3      1      3      1

$$\begin{array}{l} 4^1 = 4 \\ 4^2 = 6 \end{array}$$

$$\begin{array}{l} 4^3 = 4 \\ 4^4 = 6 \end{array}$$

$$\begin{array}{l} 5^1 = 5 \\ 5^2 = 5 \\ 5^3 = 5 \\ 5^4 = 5 \end{array}$$

$$2. 45 \times 43 \times 53 \times 59 \times 99 = 5$$

5      5      5      5

$$\begin{array}{l} 6^1 = 6 \\ 6^2 = 6 \\ 6^3 = 6 \\ 6^4 = 6 \end{array}$$

$$\begin{array}{l} 7^1 = 7 \\ 7^2 = 9 \\ 7^3 = 3 \\ 7^4 = 1 \\ 7^5 = 7 \end{array}$$

$$3. 263 \times 521 \times 932 \times 46 = 6$$

3      6      6

Cyclicity = 1

$$4. 534 \times 62012 \times 677 \times 49 = 4$$

8      6      4

$$\begin{array}{l} 8^1 = 8 \\ 8^2 = 4 \\ 8^3 = 2 \\ 8^4 = 6 \end{array}$$

$$\begin{array}{l} 9^1 = 9 \\ 9^2 = 1 \\ 9^3 = 9 \\ 9^4 = 1 \end{array}$$

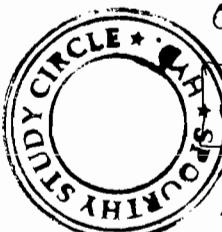
$$5. 719 \times 528 \times 72 \times 69 = 6$$

2      4      6

Cyclicity = 4

Cyclicity = 2

: Cyclicity :



$$\begin{array}{l} 2^1 = 2 \\ 2^2 = 4 \\ 2^3 = 8 \\ 2^4 = 6 \end{array}$$

$$\begin{array}{l} 3^1 = 3 \\ 3^2 = 9 \\ 3^3 = 7 \\ 3^4 = 1 \end{array}$$

$$\begin{array}{l} 2^5 = 2 \\ 2^6 = 4 \\ 2^7 = 8 \\ 2^8 = 6 \end{array}$$

$$\begin{array}{l} 3^5 = 3 \\ 3^6 = 9 \\ 3^7 = 7 \\ 3^8 = 1 \end{array}$$

Cyclicity = 4

Cyclicity = 4

①  $7^{99}$  ನಿರ್ದಿಷ್ಟನಾಮಿ-ದೊಡ್ಡ ಪ್ರಾಯ ?

$$4) 99($$

$$\begin{array}{r} \overline{\overline{3}} \\ \overline{\overline{7}} \\ = 7^3 \\ = 3 \end{array}$$

\*  $\overline{\overline{3}} = 0$  ವಸ್ತು ಭೂತ್ವ = 4 ತೆಂಜಿಂಡಿ

\* Imp.

②  $17^{253}$  ನಿರ್ದಿಷ್ಟನಾಮಿ-ದೊಡ್ಡ ಪ್ರಾಯ ಬೆಲು ?

$$\begin{array}{r} \overline{\overline{5}} \\ \overline{\overline{2}} \\ = 17^1 \end{array}$$

= 7 (ನಿರ್ದಿಷ್ಟನಾಮಿ-ದೊಡ್ಡ ಪ್ರಾಯ)

$$3) 7^{197} + 9^{255} \text{ నుండి } 8 \text{ లో వచ్చే శాశ్వత అడవి?} = (- - - - 9')$$

$4) \begin{array}{r} 197 \\ 97 \\ \hline \end{array}$	$\frac{4(255)}{55}$
$\overline{3}\overline{7}\overline{0} = 1$	$\overline{3}\overline{7}\overline{0} = 3$

$$= 7^1 + 9^3 \\ = 7 + 9 \\ = 6$$

④  $17^{286} \times 19^{199}$  නිස්සුන්වන්නයි සිංහල පැටි?

$4) \begin{array}{r} 286 \\ 86 \\ \hline - \end{array}$ $\overline{-\overline{8}0} = 2$	$4) \begin{array}{r} 199 \\ 99 \\ \hline - \end{array}$ $\overline{-\overline{9}0} = 3$
---	---

$$\begin{aligned}
 &= 7^2 \times 9^3 \\
 &= 9 \times 9 \\
 &= 1
 \end{aligned}$$

$$5) \quad 7^{199} \times 9^{256} \times 3^{253} \times 2^{321} \text{ నొట్టినామంలభి }$$

— ద్వారా — అందించి ।

4) 99 (	4) 56 (	4) 53 (	4) 21 (
<u>3</u>	<u>0</u>	<u>1</u>	<u>1</u>

$$\begin{aligned}
 * \overline{0}^4 &= 0 \text{ அயுதி Power 4 தின்கீரா?} \\
 &= 1^3 \times 9^4 \times 3^1 \times 2^1 \\
 &= 3 \times 1 \times 3 \times 2 \\
 &= 8
 \end{aligned}$$

5) 123456789 నుంచి  
నేడుతలని ఎండీ లుడైవిచి?

$$\frac{4}{\overline{8} \overline{9}} = 1$$

$$\begin{array}{r}
 \text{⑦ } 7^{51} - 9^{89} \text{ ನೀಡಿರುವುದು ಹಿಂಡಿ ಅಂತಿಮ!}
 \\[10pt]
 = 7) 51( \quad | 7) 89( \\
 \hline
 \overline{\overline{3}} \quad | \quad \overline{\overline{1}}
 \end{array}$$



## సంఘాచివరల్ని మన్నాల సంభ్రమ

No. of zero's at the end of number

$$\textcircled{1} \quad 155 \times 137 \times 69 \times 13 \times 42 \\ (5 \times 31) \quad : \quad (2 \times 21) = 1 \text{ zero}$$

$$\textcircled{2} \quad 125 \times 28 \times 63 \times 91 \times 43 = 2 \text{ zeros}$$

$$5^3 \times 2^2 \times 7 \quad (\text{2 pairs})$$

$$\textcircled{3} \quad 4^{32} \times 5^{63} \times 2^9 \times 15^{16} = 73 \text{ zeros}$$

$$2^{64} \times 5^{63} \times 2^9 \times 5^{16} \times 3^{16}$$

$$\textcircled{4} \quad 1! \times 2! \times 3! \times 4! \times 5! \text{ សម្រាប់ នៅក្នុង ?}$$

$$= 1^1 \times 2^2 \times 3^3 \times 4^4 \times 5^5$$

$$= 1^1 \times 2^2 \times 3^6 \times 4^{24} \times 5^{120}$$

$$= \frac{2}{-} - 48 = \frac{120}{-}$$

$$= 2 \times 2 \times 5$$

• Eo 1006

## Negative Remainder

(ముహంగివు)

\* ఈవు అన్ని వచ్చు (-) లల్లిదించు.

$$\textcircled{5} \quad \frac{96 \times 97 \times 98}{99} \text{ లక్షితు వంతు}$$

$$= \frac{-3x - 2x - 1}{99} = \frac{-6}{99} \Rightarrow \text{ఈవు} = 99 - 6 = 93$$

$$\textcircled{6} \quad \frac{95 \times 96 \times 97 \times 98}{99}$$

$$= \frac{-4x - 3x - 2x - 1}{99} = \frac{24}{99} \Rightarrow \text{ఈవు} = 24$$

$$\textcircled{7} \quad \frac{97 \times 98 \times 101 \times 102}{99} \text{ అంటు ఈవు వంతు?}$$

$$= \frac{-2x - 1x - 2x - 3}{99} = \frac{12}{99} \Rightarrow \text{ఈవు} = 12$$

$$\textcircled{8} \quad \frac{96 \times 97 \times 98 \times 101 \times 102}{99} \text{ అంటు ఈవు వంతు?}$$

$$= \frac{-3x - 2x - 1x - 2x - 3}{99} = \frac{-36}{99} = \frac{99 - 36}{99} = 63 \text{ ఈవు}$$

$$\textcircled{9} \quad \frac{98^{126}}{97} \text{ అంటు ఈవు వంతు?}$$

$$= \frac{98 \times 98 \times 98 \times 98 \times \dots \times 98}{97} \text{ (126 times)}$$

$$= \frac{1 \times 1 \times 1 \times 1 \times 1 \times 1 \times \dots}{99} \text{ (126 times)}$$

$$= \frac{1}{99}$$

$$\Rightarrow \text{ఈవు} = 1$$

## Reminder [సేపు]

### Individual Reminder

ఒకిగా సేపు

\*\*\*

$$\textcircled{1} \quad \frac{8 \times 9}{7} \text{ సేపు వంతు?}$$

1)  $72(10)$

$$\text{సేపు} = 2$$

$$\textcircled{2} \quad \frac{8 \times 9 \times 10 \times 11}{7} \text{ ఏ జీవు వంతు?}$$

$$\frac{1 \times 2 \times 3 \times 4}{7} = \frac{24}{7} \Rightarrow \text{సేపు} = 3$$

$$\textcircled{3} \quad \frac{97 \times 96 \times 95 \times 94}{93} \text{ అంటు సేపు?}$$

$$= \frac{4 \times 3 \times 2 \times 1}{93} = \frac{24}{93} \Rightarrow \text{సేపు} = 24$$

$$\textcircled{4} \quad \frac{101 \times 102 \times 103}{99} \text{ సేపు వంతు?}$$

$$= \frac{2 \times 3 \times 4}{99} = \frac{24}{99} \Rightarrow \text{సేపు} = 24$$

$$\textcircled{5} \quad \frac{96 \times 97 \times 98}{99} \text{ అంటు సేపు వంతు?}$$

$$\textcircled{10} \quad \frac{96^{101}}{97} \text{ ఉండుకోవచ్చం ఎంత?}$$

$$= \frac{96 \times 96 \times 96 \times 96 \times \dots}{97} = 96 \text{ (101 times)}$$

$$= \frac{-1 \times -1 \times -1 \times -1 \times \dots}{97} = (-1)^{101} \text{ (101 times)}$$

$$= \frac{-1}{97} \Rightarrow \text{శిష్టం} = 97 - 1 = 96$$

$$\textcircled{11} \quad \frac{62^{132}}{9} \text{ ఉండుకోవచ్చం ఎంత?}$$

$$= \frac{62 \times 62 \times 62 \times \dots}{9} = 62^{132} \text{ (132 times)}$$

$$= \frac{-1 \times -1 \times -1 \times -1 \times \dots}{9} = (-1)^{132}$$

$$= \frac{1}{9} \Rightarrow \text{శిష్టం} = 1$$

$$\textcircled{12} \quad \frac{67^{67} + 67}{68} \text{ ఉండుకోవచ్చం ఎంత?}$$

$$= \frac{67^{67}}{68} + \frac{67}{68}$$

$$= \frac{-1 \times -1 \times -1 \times (67 \text{ సార్})}{68} + \frac{67}{68}$$

$$= \frac{-1}{68} \cdot \frac{-1}{68}$$

$$= \frac{-2}{68}$$

$$\text{శిష్టం} = 68 - 2 = 66$$

$$\textcircled{13} \quad \frac{17^{37} + 29^{37}}{23} \text{ ఉండుకోవచ్చం ఎంత?}$$

$$= \frac{(-6)^{37} + 6^{37}}{23}$$

$$= \frac{0}{23} \Rightarrow \text{శిష్టం} = 0$$

$$\textcircled{14} \quad \frac{2^{153}}{7} \text{ ఉండుకోవచ్చం కనుగొనుచు?}$$

$$= \frac{2^{3 \times 51}}{7} = \frac{(2^3)^{51}}{7} = \frac{(8)^{51}}{7}.$$

$$\text{శిష్టము} = 1.$$

**Reminder Theorem**  
(శిష్ట సిద్ధాంతం)

$$\text{d) } \begin{array}{r} N \quad (2) \\ \hline r \end{array}$$

$$N = d_2 q + r$$

N = Number  
d = divisor  
q = quotient  
r = remainder

ఖర్చులు → dividend

$$\textcircled{2} \quad \begin{array}{r} 7 \\ \hline 6 \end{array} \quad (3 \rightarrow \text{quotient (భాగఫలం)})$$

1 → remainder (శిష్టం)

① నెనుమ్మును 4 తో భాగిస్తే శిష్టం 3 వ్యాపిస్తుంది, అదినుమ్మును 3 రథ్యానుమ్మును 4 తో భాగిస్తే శిష్టము ఎంత?

Method 1:

$$4 \text{ తో } \frac{3}{4} \text{ శిష్టము వ్యాపిస్తుంది} = 1$$

$$3 \text{ రథ్యానుమ్ము } = 3 \times 1 = 3$$

$$\text{d) } \begin{array}{r} 21 \quad (5) \\ \hline 1 \end{array}$$

Method 2:

$$\text{d) } \begin{array}{r} N \quad (2) \\ \hline 3 \end{array}$$

$$\text{సంఖ్య } N = 4q + 3$$

$$3 \text{ రథ్యానుమ్ము } 3N = 12q + 9$$

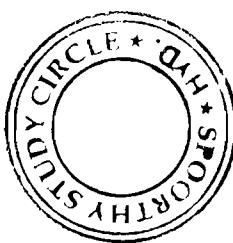
$$4 \text{ తో } \frac{9}{4} \text{ శిష్టము వ్యాపిస్తుంది} = 1$$

② విభజకం ఖీగాలనుకి తరెట్టు మరియు  
శేషాన్ని రెట్టు. శేషము 3-అయితే విభజిం  
వంత?

$$(విభజక) \quad d ) \quad N \quad ( \text{న} (\text{ఖీగాలం}) \\ \underline{r - \text{శేషము}}$$

$$d = 32 \quad | \quad d = 6r \quad | \quad \text{శేషము} = r = 3 \\ \frac{18}{6} = 3 \quad | \quad d = 6 \times 3 \quad | \\ r = 6 \quad | \quad d = 18 \quad |$$

$$N = dr + r \\ = 18 \times 6 + 3 \\ = 108 + 3 \\ = 111$$



③ ఒక సంఖ్యను నీడ విభజకంచే ఖీగాస్తి శేషము  
24 వస్తుంది. ఈ సంఖ్యకు రెట్టించు సంఖ్యని గుర్తి  
విభజకంచే ఖీగాస్తి శేషము || వస్తుంది.  
అయితే విభజకము ఎంత?

$$N = dr + r$$

$$\text{సంఖ్య} N = dr + 24$$

$$- \text{రెట్టించు సంఖ్య} \quad 2N = 2dr + 48$$

$$d = ) 48 \\ \underline{- 37} \\ 11$$

$$d = 37$$

## 2 Digit Number

### రెట్టించు సంఖ్య

① నీరెట్టించు సంఖ్య, అండలను తొప్పుగుచేయగా  
విష్టిన సంఖ్యలు మధ్య చెఱుం ఐల్లపుడూ ఏసంఖ్య  
చే ఖీగాస్తి బంచుతుంది?

② నీరెట్టించు సంఖ్య, అండలను తొప్పుగుచేయగా  
విష్టిన సంఖ్యలు మొత్తం || సంఖ్యచే ఖీగాస్తి బంచుతుంది.

③ వచ్చించు సంఖ్యలు చెఱువుని, వందలసాసం  
శ్రీఘరంలను తొప్పుగుచేయగా విష్టిన సంఖ్యలు  
చేచుం ఐల్లపుడూ ఏసంఖ్యచే ఖీగాస్తి బంచుతుంది!

$$1A \quad \begin{array}{r} \text{తేడా} = 2 \\ \begin{array}{r} 2 \\ \swarrow \quad \searrow \\ 4 \quad 2 \\ \swarrow \quad \searrow \\ 1 \quad 3 \end{array} \\ \hline 18 \end{array} \quad \begin{array}{r} 2 \\ \swarrow \quad \searrow \\ 4 \quad 2 \\ \swarrow \quad \searrow \\ 2 \quad 4 \\ \hline 18 \end{array} \quad \begin{array}{r} 8 \\ \swarrow \quad \searrow \\ 9 \quad 1 \\ \swarrow \quad \searrow \\ 1 \quad 9 \\ \hline 72 \end{array} \quad \begin{array}{r} 3 \\ \swarrow \quad \searrow \\ 7 \quad 4 \\ \swarrow \quad \searrow \\ 4 \quad 7 \\ \hline 27 \end{array}$$

$$xy = 10x + y$$

$$yx = 10y + x$$

$$\text{తేడా} = 9x - 9y$$

$$= 9(x - y)$$

$$= 9(\text{అండల సంఖ్యల్లో అండల మధ్య ఫేర్చు})$$

### 2A

$$\begin{array}{r} \text{మొత్తం} = 4 \\ \begin{array}{r} 3 \quad 1 \\ \swarrow \quad \searrow \\ 4 \quad 2 \\ \swarrow \quad \searrow \\ 1 \quad 3 \end{array} \\ \hline + 1 \quad 3 \end{array} \quad \begin{array}{r} 6 \\ \swarrow \quad \searrow \\ 9 \quad 1 \\ \swarrow \quad \searrow \\ 1 \quad 9 \\ \hline 110 \end{array} \quad \begin{array}{r} 10 \\ \swarrow \quad \searrow \\ 7 \quad 4 \\ \swarrow \quad \searrow \\ 4 \quad 7 \\ \hline 121 \end{array}$$

$$xy = 10x + y$$

$$+ yx = 10y + x$$

$$= 11x + 11(y)$$

$$= 11(x + y)$$

3A

త్రిడో = 2

$$\begin{array}{r} -1\ 2\ 3 \\ \hline 1\ 9\ 8 \end{array}$$

౨×౧౧ లావండి

R.S. Aggarwal Book

$$\textcircled{1} \quad 856973 \rightarrow \begin{array}{r} 6000 \\ -6 \\ \hline 5994 \end{array}$$

$$\textcircled{2} \quad 32675149 \rightarrow \begin{array}{r} 70,000 \\ -7 \\ \hline 69993 \end{array}$$

$$\textcircled{3} \quad \begin{array}{r} 69\cancel{7}584\cancel{7}2 \\ \text{எட்டு} \qquad \text{ஏடு ஏ} \\ \hline 700000 \\ - 70 \\ \hline 699930 \end{array}$$

$$\textcircled{4} \quad 784 \times 618 \times 917 \times 463 \Rightarrow 2$$

$$\text{ପରିବାରକ୍ଷା } xy = 10x + y$$

$$\begin{array}{r} \text{మార్గసంక్లిప్} \quad yx = 10y + x \\ \hline 54 = 9(x-y) \end{array}$$

$$\text{ଓৰূপ হৈতি} = x+y = 10$$

$$x + y = 10$$

$$x - 4 = 6$$

$$2x = 168$$

$$x = 8$$

$$y = 2$$

$$\text{ଓন୍ଦର ଲୋପ} = xy = 82$$

$$\text{మరిన సంఖ్య} = 4x = 28$$

A circular library stamp with the words "SCHOOL STUDY CIRCLE" around the top edge and "MY" at the bottom. In the center is a smaller circle containing the number "5". To the right of the stamp is the number "105".

$$= \frac{1}{7}$$

$$4) \underline{105} ($$

$$\begin{array}{r}
 \textcircled{7} \quad 7^{95} - 3^{58} \\
 4) 95( \qquad \qquad 4) 58( \\
 \underline{-\quad 3} \qquad \qquad \underline{-\quad 2} \\
 = \quad 7^3 - 3^2
 \end{array}$$

$$= 3 - 9 \quad \begin{array}{r} 13 \\ \underline{-} \quad \underline{-} \end{array} \quad = 4$$

$$\begin{aligned} 8) &= (4137)^{754} & 4) 54( \\ &= 7^{54} & \frac{840}{\cancel{8}} = 2 \\ &= 7^2 \\ &= 9 \end{aligned}$$

$$\begin{aligned} 9) &= 6374^{1793} \times 625^{317} \times 341^{491} \\ &= 4^{93} \times 5^{17} \times 1^{91} \\ &\quad 4) 93(\times 4) 17(\quad 4) 91( \\ &\quad \frac{840}{\cancel{840}} = 1 \quad \frac{1}{1} \quad \frac{3}{3} \\ &= 4^1 \times 5^1 \times 1^3 \\ &= 0 \end{aligned}$$

From 10 - 15 Questions LKG Question  
ఎన్న వీరు చేస్తావా?

$$= \frac{\frac{2247}{8988}}{8} \times \frac{1}{4} = 280.87$$

$$25) \quad \frac{666}{\frac{6}{3}} = \frac{\frac{37}{666}}{\cancel{6}} \times \frac{1}{3} = 37$$

$$26) \quad \frac{\frac{50}{800}}{\cancel{54}} \times \frac{\frac{9}{36}}{\cancel{36}} = 450$$

$$27) \quad \frac{12 \times 12 \times 12 \times 6 \times 6 \times 6}{\cancel{432}} = 3631$$

$$= 4 \times 1296 \Rightarrow 5184$$

$$= 5358 \times 51$$

$$= 5358 \times (50+1)$$

$$= 267900 + 5358$$

$$= 273258$$

$$30) \quad = 587 \times 999$$

$$= 587 \times (1000-1)$$

$$\begin{array}{r} 587000 \\ - 587 \\ \hline 586413 \end{array}$$

$$31) \quad = 3897(1000-1)$$

$$\begin{array}{r} 3897000 \\ - 3897 \\ \hline 3893103 \end{array}$$

$$32) \quad 72519(10000-1)$$

$$\begin{array}{r} 725190000 \\ - 72519 \\ \hline 725117481 \end{array}$$

$$\begin{aligned} 23) \quad \frac{(1000)^9}{10^{24}} &= \frac{(10^3)^9}{10^{24}} = \frac{10^{27}}{10^{24}} \\ &= 10^3 \end{aligned}$$

$$= 1000$$

$$24) \quad \frac{8988}{\frac{8}{4}} = \frac{\frac{2247}{8988} \times 1}{\cancel{82}} \quad \cancel{4}$$

$$34) = 1904 \times 1904$$

$$= (1904)^2$$

$$= (1900+4)^2$$

$$(a+b)^2 = a^2 + b^2 + 2ab$$

$$36100000$$

$$\begin{array}{r} 16 \\ \times 1900 \\ \hline 3625216 \end{array}$$

$$15200$$

OR

$$a^2 - b^2 = (a+b)(a-b)$$

$$a^2 = (a+b)(a-b) + b^2$$

$$(1904)^2 = (1904+4)(1904-4) + 4^2$$

$$= (1908)(1900) + 16$$

$$= 3625200 + 16$$

$$= 3625216$$

35)

$$1397^2 = (1397+3)(1397-3) + 3^2$$

$$a^2 = (a+b)(a-b) + b^2$$

$$= (1394)(1400) + 9$$

$$= 1951600 + 9$$

$$= 1951609$$

$$107^2 + 93^2$$

$$a^2 = (a+b)(a-b) + b^2$$

$$107^2 = (107+7)(107-7) + 7^2$$

$$= (114)(100) + 49$$

$$= 11449$$

$$93^2 = (93+7)(93-7) + 7^2$$

$$= 8649$$

$$\Rightarrow 11449 + 8649$$

$$= 20098$$

### Formula's

$$1. (a+b)^2 = a^2 + b^2 + 2ab$$

$$2. (a-b)^2 = a^2 + b^2 - 2ab$$

$$3. a^2 - b^2 = (a+b)(a-b)$$

$$4. (a+b)^2 + (a-b)^2 = 2(a^2 + b^2)$$

$$5. (a+b)^2 - (a-b)^2 = 4ab$$

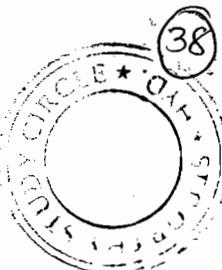
$$37) (200+17)^2 + (200-17)^2$$

$$= 2(200^2 + 17^2)$$

$$= 2(40000 + 289)$$

$$= 80000 + 578$$

$$= 80578$$



$$38) = 106^2 - 94^2$$

$$a^2 - b^2 = (a+b)(a-b)$$

$$= (106+94)(106-94)$$

$$= (200)(12)$$

$$= 2400$$

39)

$$= 8796(223+77)$$

$$= 8796(300)$$

$$= 2638800$$

40)

$$= 287 \times 287 + 269 \times 269 - 2 \times 287 \times 269$$

$$- a^2 + b^2 - 2ab = (a-b)^2$$

$$= (287 - 269)^2$$

$$= (18)^2$$

$$= 324$$

$(a+b)^2 = (a-b)^2 + 4ab$
$(a-b)^2 = (a+b)^2 - 4ab$

Formula's

$$\begin{aligned}
 41) & (476+424)^2 - 4 \times 476 \times 424 \\
 &= (a+b)^2 - 4ab = (a-b)^2 \\
 &= (476 - 424)^2 \\
 &= (52)^2 \\
 &= 2704
 \end{aligned}$$

$$\begin{aligned}
 45) & 397^2 + 104^2 + 2 \times 397 \times 104 \\
 & a^2 + b^2 + 2ab = (a+b)^2 \\
 &= (397+104)^2 \\
 &= (501)^2 \\
 &= (502)(500) + 1^2 \\
 &= 2510001
 \end{aligned}$$

$$\begin{aligned}
 46) & 64^2 - 36^2 = 20x \\
 & a^2 - b^2 \\
 & (64+36)(64-36) = 20x \\
 & (100)(28) = 20x \\
 & x = 140
 \end{aligned}$$

$$\begin{aligned}
 47) & \frac{(489+375)^2 - (489-375)^2}{489 \times 375} \\
 &= \frac{(a+b)^2 - (a-b)^2}{ab} \\
 &= \frac{4ab}{ab} \Rightarrow 4
 \end{aligned}$$



$$\begin{aligned}
 48) & (963+476)^2 + (963-476)^2 \\
 &= 753^2 + 247^2 \\
 &= \frac{1}{1000}
 \end{aligned}$$

1. $(a+b)^3 = a^3 + b^3 + 3a^2b + 3ab^2$
$= a^3 + b^3 + 3ab(a+b)$
2. $(a-b)^3 = a^3 - b^3 - 3a^2b + 3ab^2$
$= a^3 - b^3 - 3ab(a-b)$
3. $a^3 + b^3 = (a+b)(a^2 - ab + b^2)$
4. $a^3 - b^3 = (a-b)(a^2 + ab + b^2)$

$$\begin{aligned}
 49) & \frac{a^3 + b^3}{a^2 - ab + b^2} \quad \left( \begin{array}{l} a^3 + b^3 = (a+b)(a^2 - ab + b^2) \\ \frac{a^3 + b^3}{a^2 - ab + b^2} = a+b \end{array} \right) \\
 & a+b \\
 & 768 + 232 \\
 & = 1000
 \end{aligned}$$

$$\begin{aligned}
 50) & \frac{a^3 - b^3}{a^2 + ab + b^2} \quad \left( \begin{array}{l} a^3 - b^3 = (a-b)(a^2 + ab + b^2) \\ \frac{a^3 - b^3}{a^2 + ab + b^2} = a-b \end{array} \right) \\
 & = (a-b) \\
 & = 854 - 276 \\
 & = 578
 \end{aligned}$$

$$\begin{aligned}
 51) & \frac{a^2 + b^2 - ab}{a^3 + b^3} \quad \left( \begin{array}{l} a^3 + b^3 = (a+b)(a^2 - ab + b^2) \\ \frac{1}{a+b} = \frac{a^2 - ab + b^2}{a^3 + b^3} \end{array} \right) \\
 & = \frac{1}{a+b} \\
 & = \frac{1}{753 + 247} \\
 & = \frac{1}{1000}
 \end{aligned}$$

52.  $517 * 324$   
 $= 5+1+7+3+2+4$   
 $= 22$

$$\begin{array}{r} 24 \quad (3 \times 8) \\ 27 \quad (3 \times 9) \\ 30 \quad (3 \times 10) \end{array}$$

(2) ✓  $\sqrt{5170}$

53.  $481 * 673$   
 $= 4+8+1+6+7+3 = 29 *$

(36)  $\times$  ✓  
(45)  $\times$  ✗

54.  $9+21+5+6$   
 $\text{శీర్షకాల} = 9+2+5+6 \quad \text{స్వ.} = 7+1+*$   
 $= 22 \quad = 8+(* \rightarrow 3) \checkmark$   
 $= 22-8$   
 $= 14-3$   
 $= 11$

55.  $918+6 * 2$   
 $\times \frac{612}{8}, \times \frac{622}{8}, \boxed{\frac{632}{8}} \checkmark, 642 \times$

56.  $45$   
 $9 \quad 5 \quad (\text{స్వతంత్ర సంఖ్య})$   
 $\text{సంఖ్య} = 1$

- (a)  $181560 = 21 \times$   
(b)  $331145 = 17 \times$   
(c)  $202860 = 18 \checkmark$   
(d)  $203550 = 15 \times$

57.  $99$   
 $11 \quad 9$

(a)  $3572404 = 18-7 = 11 \times$   
(b)

(b)  $135+92 = 15-12 = 3 \times$

(c)  $913464 = 18-9 \times$

(d)  $114345 = 9-9 \times \checkmark 18 \checkmark$

(58)

$$72$$

9      8

$$= 4 \otimes 25 + 3 *$$

$$= 4+2+5+7+3$$

$$= 21$$

$$\frac{736}{8}$$

(59)

$653 \times *$ $653 \times$ అనేది 8 చే భోగించబడుతుంది	80 చే భోగించబడుతుంది నొవరు అందు = 0 లుండు $y = 0$
---	---



$53 \times (6+7)$ $48$ $\frac{56}{56}$ $x$	$= x+y$ $= 6+0$ $= 6$
---	-----------------------------

(60)

$$4864 \times 9 P 2$$

$9+2 = 11$

$$12$$

3      4  
 1      P  
 4      7  
 15  
 18

(61)  $5 * 2$

$$= 5+2 = 7$$

$$6$$

2      3

9 - 2

12 - 5

15 - 8

ఇంచుట సభ్యులు \* place in the following.

(62)

$$\begin{array}{c} 24 \\ \diagdown \quad \diagup \\ 3 \quad 8 \end{array} \text{ (ನ್ಯಾತಿಫಾನಸಂಖ್ಯೆ)}$$

Option 'D' right Answer.

(63)

$$132 \Rightarrow 11 \times 12 \\ = 11 \times 3 \times 4$$

264, 396, 462, 792, 968, 2178, 5184, 6336

4

3

11

264, 396, 792, 6336

(64)



$$11 \rightarrow (4+6+y) - (7+x+0) = 0 / 11 \text{ ನಂಜಿಕೆ}$$

$$10+y-7-x=0$$

$$10+5-7-8=0$$

$$0=0$$

$$3 \rightarrow 4+7+6+x+y=0$$

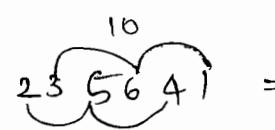
$$17+x+y \mid 3 \text{ ನಂಜಿಕೆ}$$

$$(A) 7, 4 \rightarrow 14+7+4=28 \text{ (ಇದು ಕೋರಿ)}$$

$$(B) 7, 5 \rightarrow 17+7+5=29 \text{ (X)}$$

$$(C) 8, 5 \rightarrow 17+8+5=30 \text{ (V)}$$

(65)



$$\checkmark (D) 4, 5, 6, 2, 4 = 11-11=0$$

(66)

6-ಡಿಫೆರೆಂಟ್ ತಿಳಿಲಂಘನ್

102, ..., 108, ..., 996

$$\text{ಎರ್ಥನಂಖ್ಯೆ} = \frac{\text{ಅಂತಿಮನಂಖ್ಯೆ} - \text{ಪ್ರಥಮನಂಖ್ಯೆ}}{6} + 1$$

ವಾಟಿ ಮುದ್ದುಗೆ

$$= \frac{996-102}{6} + 1 \\ = \frac{894}{6} + 1 \\ = 150$$

Some formula's

	ನಂಜಿ	ಒತ್ತಿ	ನಂಜಿ
1	1, 2, 3, ..., n	$\frac{n(n+1)}{2}$	$\frac{n+1}{2}$
2	2, 4, 6, ..., (n)	n(n+1)	(n+1)
3	1, 2, 3, ..., 100	$n^2$	n

(67)

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

$$45 \text{ } " \text{ } " = \frac{45(45+1)}{2}$$

$$= \frac{45(46)}{2}$$

$$= 1035$$

(68)

2, 4, 6, ..., 30

$$15 \text{ ನಂಖ್ಯೆಗೆ } n \text{ ನಂಜಿಗೆ ಒತ್ತಿ} = n(n+1)$$

$$= 15(15+1)$$

$$= 15 \times 16$$

$$= 240$$

(69)

$$= 51+52+53+\dots+100$$

$$= (1+2+3+\dots+100) - (1+2+3+\dots+50)$$

$$= \frac{100 \times 101}{2} - \frac{50 \times 51}{2}$$

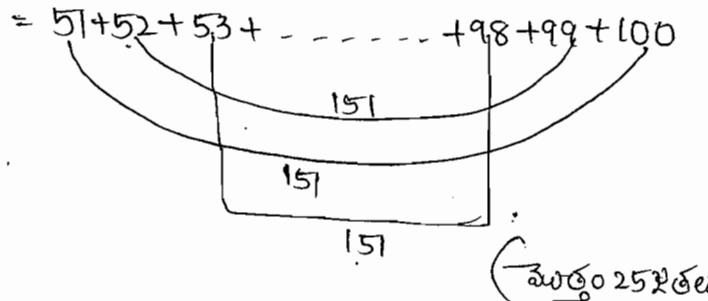
$$= 5050 - 1275$$

$$= 3775$$

69)

69 (OR)

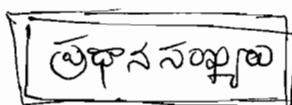
$$51 + 52 + 53 + \dots = 100$$



$$= 151 \times 25$$

$$= 3775$$

70)



$$1 \rightarrow 100 (25)$$

$$1 \rightarrow 200 (45)$$



$$2, 3, 5, 7, 11, 13, 17, 19, 23$$

$$\textcircled{a} 119 \quad \textcircled{b} 187 \quad \textcircled{c} 247 \quad \textcircled{d} 551$$

$$\frac{119}{11} \quad \frac{187}{11} \quad \frac{247}{13} \cdot \frac{551}{19}$$

இந்த எண்கள் விடை முதலாக வரும்.

விடையும் \* 3-முடில்ரூப்பு நாட்டு  
101 ராஜ்ய வடிவாகு.

2	3	5	7	11
13	17	19	23	29
31	37	41	43	47
53	59	61	67	71
73	79	83	89	97
101	103	107	109	113
127	131	137	139	149
151	157	163	167	173
179	181	191	193	197
199				

70)

2 - Answer

71)

$$2+3+5+7+11 = 28$$

72)

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31,  
37, 41, 43, 47 (வீட்டு 15)

73)

97 - Answer

74)

$$13 \times 7 = 91$$

75)

101, 221, 373, 437.

$$221, 373, 437$$

$$\frac{221}{13} \quad \begin{array}{l} \checkmark \\ \text{Answer} \end{array} \quad \frac{373}{19} \quad \begin{array}{l} \checkmark \\ \text{Answer} \end{array}$$

$$\textcircled{76} \quad \sqrt{551} = \sqrt{576} = 24$$

$$2, 3, 5, 7, 11, 13, 17, 19, 23$$

$$\textcircled{a} 119 \quad \textcircled{b} 187 \quad \textcircled{c} 247 \quad \textcircled{d} 551$$

$$\frac{119}{11} \quad \frac{187}{11} \quad \frac{247}{13} \cdot \frac{551}{19}$$

இந்த எண்கள் விடை முதலாக வரும்.

விடையும் \* 3-முடில்ரூப்பு நாட்டு  
101 ராஜ்ய வடிவாகு.

$$\textcircled{78} \quad 3, 5 \text{ சீரின்டாஸ் முறையும்}$$

$$\textcircled{a} 3+5=8 \checkmark \quad \textcircled{b} 3+5+1 \times$$

$$\textcircled{c} 3 \times 5=15 \times \quad \textcircled{d} 3 \times 5+2=17 \times$$

$$\textcircled{79} \quad \begin{array}{l} \text{ஒத்துபான்} \\ \hline 1^2 = 1 \\ 2^2 = 4 \\ 3^2 = 9 \\ 4^2 = 6 \\ 5^2 = 5 \\ 6^2 = 6 \\ 7^2 = 9 \\ 8^2 = 4 \\ 9^2 = 1 \end{array}$$

$$\left\{ \begin{array}{l} \text{ஒத்துபான்} \\ \hline 1, 4, 9, 65 (\text{போன்ற}) \\ 2, 3, 7, 8 (\text{போன்ற}) \end{array} \right.$$

$$\textcircled{80} \quad \text{Answer} - 2016 \neq 42437$$

$$\textcircled{81} \quad \begin{array}{r} 4456 (742) \\ \hline 42 \\ \overline{25} \\ \overline{24} \\ \overline{16} \\ \overline{12} \\ \overline{4} \end{array}$$

$$\begin{array}{r} 74 \\ \times 2 \\ \hline 148 \\ +148 \\ \hline 148 \\ \times 2 \\ \hline 296 \\ +296 \\ \hline 592 \\ \times 2 \\ \hline 1184 \\ +1184 \\ \hline 2368 \\ \times 2 \\ \hline 4736 \\ +4736 \\ \hline 9472 \\ \times 2 \\ \hline 18944 \\ +18944 \\ \hline 37888 \\ \times 2 \\ \hline 75776 \\ +75776 \\ \hline 151552 \\ \times 2 \\ \hline 303104 \\ +303104 \\ \hline 606208 \\ \times 2 \\ \hline 1212416 \\ +1212416 \\ \hline 2424832 \\ \times 2 \\ \hline 4849664 \\ +4849664 \\ \hline 9699328 \\ \times 2 \\ \hline 19398656 \\ +19398656 \\ \hline 38797312 \\ \times 2 \\ \hline 77594624 \\ +77594624 \\ \hline 155189248 \\ \times 2 \\ \hline 310378496 \\ +310378496 \\ \hline 620756992 \\ \times 2 \\ \hline 1241513984 \\ +1241513984 \\ \hline 2483027968 \\ \times 2 \\ \hline 4966055936 \\ +4966055936 \\ \hline 9932111872 \\ \times 2 \\ \hline 19864223744 \\ +19864223744 \\ \hline 39728447488 \\ \times 2 \\ \hline 79456894976 \\ +79456894976 \\ \hline 158913789952 \\ \times 2 \\ \hline 317827579904 \\ +317827579904 \\ \hline 635655159808 \\ \times 2 \\ \hline 1271310319616 \\ +1271310319616 \\ \hline 2542620639232 \\ \times 2 \\ \hline 5085241278464 \\ +5085241278464 \\ \hline 10170482556928 \\ \times 2 \\ \hline 20340965113856 \\ +20340965113856 \\ \hline 40681930227712 \\ \times 2 \\ \hline 81363860455424 \\ +81363860455424 \\ \hline 162727720910848 \\ \times 2 \\ \hline 325455441821696 \\ +325455441821696 \\ \hline 650910883643392 \\ \times 2 \\ \hline 1301821767286784 \\ +1301821767286784 \\ \hline 2603643534573568 \\ \times 2 \\ \hline 5207287069147136 \\ +5207287069147136 \\ \hline 1041457413829472 \\ \times 2 \\ \hline 2082914827658944 \\ +2082914827658944 \\ \hline 4165829655317888 \\ \times 2 \\ \hline 8331659310635776 \\ +8331659310635776 \\ \hline 16663318621271552 \\ \times 2 \\ \hline 33326637242543104 \\ +33326637242543104 \\ \hline 66653274485086208 \\ \times 2 \\ \hline 133306548970172416 \\ +133306548970172416 \\ \hline 266613097940344832 \\ 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\\ \hline 15738059470088768166866244475296 \\ +15738059470088768166866244475296 \\ \hline 31476118940177536333732488950592 \\ \times 2 \\ \hline 62952237880355072667464977901184 \\ +62952237880355072667464977901184 \\ \hline 125904475760710145334939555802368 \\ \times 2 \\ \hline 251808951521420290669879111604736 \\ +251808951521420290669879111604736 \\ \hline 503617903042840581339758223209472 \\ \times 2 \\ \hline 100723580608568116267956446418944 \\ +100723580608568116267956446418944 \\ \hline 201447161217136232535912892837888 \\ \times 2 \\ \hline 402894322434272465071825785675776 \\ +402894322434272465071825785675776 \\ \hline 805788644868544930143651571351552 \\ \times 2 \\ \hline 161157728973708986028703114270304 \\ +161157728973708986028703114270304 \\ \hline 322315457947417972057406228540608 \\ \times 2 \\ \hline 644630915894835944114812457081216 \\ +644630915894835944114812457081216 \\ \hline 1289261831789671888228249014162432 \\ \times 2 \\ \hline 2578523663579343776456498028324864 \\ +2578523663579343776456498028324864 \\ \hline 5157047327158687552912996056649728 \\ \times 2 \\ \hline 1031409465431735511582599211329456 \\ +1031409465431735511582599211329456 \\ \hline 2062818930863471023165994422658912 \\ \times 2 \\ \hline 4125637861726942046331988845317824 \\ +4125637861726942046331988845317824 \\ \hline 825127572345388409266397769063568 \\ \times 2 \\ \hline 1650255144690776818532795538127136 \\ +1650255144690776818532795538127136 \\ \hline 3300510289381553637065591076254272 \\ \times 2 \\ \hline 6601020578763107274131182152508544 \\ +6601020578763107274131182152508544 \\ \hline 1320204115752621454826364230501708 \\ \times 2 \\ \hline 2640408231505242909652728461003416 \\ +2640408231505242909652728461003416 \\ \hline 5280816463010485819305456922006832 \\ \times 2 \\ \hline 10561632926020971638610913844013664 \\ +10561632926020971638610913844013664 \\ \hline 21123265852041943277221827688027328 \\ \times 2 \\ \hline 42246531704083886554443655376054656 \\ +42246531704083886554443655376054656 \\ \hline 84493063408167773108887310752109312 \\ \times 2 \\ \hline 16898612681633554621775421504218624 \\ +16898612681633554621775421504218624 \\ \hline 33797225363267109243550843008437248 \\ \times 2 \\ \hline 67594450726534218487001688016874496 \\ +67594450726534218487001688016874496 \\ \hline 13518890145306843694003377603355992 \\ \times 2 \\ \hline 27037780290613687388006755206711884 \\ +27037780290613687388006755206711884 \\ \hline 54075560581227374776001351041423768 \\ \times 2 \\ \hline 10815112116245475552002702082847536 \\ +10815112116245475552002702082847536 \\ \hline 21630224232490951104005404165695136 \\ \times 2 \\ \hline 43260448464981902208001080831390272 \\ +43260448464981902208001080831390272 \\ \hline 86520896929963804416002161662780544 \\ \times 2 \\ \hline 17304179385992760883200432332556096 \\ +17304179385992760883200432332556096 \\ \hline 34608358771985521766400864665112192 \\ \times 2 \\ \hline 69216717543971043532801729330224384 \\ +69216717543971043532801729330224384 \\ \hline 13843343508794208706403458660448768 \\ \times 2 \\ \hline 27686687017588417412806917320897536 \\ +27686687017588417412806917320897536 \\ \hline 55373374035176834825601383441795072 \\ \times 2 \\ \hline 11074674807035366965120277688359144 \\ +11074674807035366965120277688359144 \\ \hline 22149349614070733930240555376718288 \\ \times 2 \\ \hline 44298699228141467860481110753436576 \\ +44298699228141467860481110753436576 \\ \hline 88597398456282935720962221506873152 \\ \times 2 \\ \hline 17719479691256587144192444301374304 \\ +17719479691256587144192$$

$$\begin{array}{r} 99999 \\ -81 \\ \hline 99918 \end{array}$$

4 తేసిపేసినా న్యూఐంగ్ ఫీల్డ్స్ చయితుంది .

2 కల్పినా శూడ్ ॥ ॥

(82) 88  
|| 8 - తెడు

- (a) ✓ ✓ (65)
- (b) ✓ ✓ (23) ✓
- (c) ✓ ✓ (153)
- (d) X -

(83) 15) 8485 (113

$$\begin{array}{r} 75 \\ 98 \\ \hline 75 \\ 235 \\ 225 \\ \hline 10 \end{array} \rightarrow \text{తేసిపేసినా}$$

$$\begin{array}{r} 8485 \\ -10 \\ \hline 8475 \end{array}$$

(84) 88) 9999 (113

$$\begin{array}{r} 88 \\ 119 \\ 88 \\ \hline 319 \\ 264 \\ \hline 55 \end{array} \rightarrow \text{తేసిపేసినా}$$

$$\begin{array}{r} 9999 \\ -55 \\ \hline 9944 \end{array}$$

(85) 91) 99999 (1098

$$\begin{array}{r} 91 \\ 899 \\ 819 \\ \hline 809 \\ 728 \\ \hline 81 \end{array} \rightarrow \text{తేసిపేసినా}$$

(86) 87) 13601 (156

$$\begin{array}{r} 87 \\ 490 \\ 435 \\ \hline 551 \\ 522 \\ \hline 29 \end{array} \rightarrow \text{తేసిపేసినా}$$

(87) 23) 1056 (45

$$\begin{array}{r} 92 \\ 136 \\ 115 \\ \hline 21 \end{array} \rightarrow \text{తేసిపేసినా}$$

(88) 41) 10,000 (243

$$\begin{array}{r} 82 \\ 180 \\ 164 \\ \hline 160 \\ 123 \\ \hline 37 \end{array} \rightarrow \text{తేసిపేసినా}$$

$$\begin{array}{r} 10,000 \\ +4 \\ \hline 10004 \end{array}$$

(89) 111) 100000 (90

$$\begin{array}{r} 100000 \\ -999 \\ \hline 100 \end{array} \rightarrow \text{తేసిపేసినా}$$

$$\begin{array}{r} 100000 \\ +11 \\ \hline 100011 \end{array}$$

(90) N (2 (ఖా))

$$\begin{array}{r} 2 \\ \hline 2 \end{array}$$



$$N = d_2 + r$$

$$\begin{array}{c} d = 102 \\ 230 = 102 \times 2 \\ q = 23 \\ \hline d = 5r \\ d = 5 \times 46 \\ d = 230 \end{array}$$

$$\begin{aligned} \text{ව්‍යුත්ථාපන} &= N = d_2 + r \\ &= 230 \times 23 + 46 \\ &= 5290 + 46 \\ &= 5336 \end{aligned}$$

91)

$$68) N(269)$$

$$\overline{0}$$

$$\begin{aligned} N &= d_2 + r \\ &= 68 \times 269 + 0 \end{aligned}$$

$$N = 68 \times 269$$

$$= \frac{269 \times 68}{67} \quad (\text{කිහිපි තීරණයක් සඳහා ප්‍රතිච්ඡා නොවනු ලබයි})$$

$$= \frac{1 \times 1}{67}$$

$$= \frac{1}{67} \rightarrow \text{කිහිපි}$$

92)

$$56) N(2)$$

$$\overline{29}$$

$$N = 562 + 29$$

$$8 \text{ අංක තුළු } = \frac{562}{8} + \frac{29}{8} \times$$

$$= \text{කිහිපි} = 5$$

93)

$$357) N(2)$$

$$\overline{39}$$

$$N = 3572 + 39$$

$$17 \text{ අංක තුළු } = \frac{3572}{17} + \frac{39}{17} \rightarrow \text{කිහිපි} = 5$$

$$94) 5) N(2)$$

$$\overline{3}$$

$$N = 52 + 3$$

$$\text{ව්‍යුත්ථාපන} N^2 = (52+3)^2$$

$$= 252^2 + 302 + 9$$

$$5 \text{ අංක තුළු } = \frac{252^2}{5} + \frac{302}{5} + \frac{9}{5}$$

$$\text{කිහිපි} = 4$$

(OR)

$$5 \text{ අංක තුළු } \rightarrow 50 = 3$$

'8' අවස්ථාව

$$\sqrt{50} = 8^2 = 64$$

$$5) 64(12)$$

$$\overline{4}$$

95)



$$\begin{array}{r} \text{ව්‍යුත්ථාපන} \\ x \\ \hline y \\ y ) x ( 6 \\ \hline 15 \end{array}$$

$$x = 6y + 15$$

$$x - y = 1365$$

$$6y + 15 - y = 1365$$

$$5y = \frac{1350}{270}$$

$$y = 270$$



96)

ප්‍රත්‍යාග්‍ය

$$12) N(35)$$

$$N = 12 \times 35 + 0$$

$$N = 420$$

ප්‍රත්‍යාග්‍ය

$$21) \frac{420}{420} (20)$$

$$\overline{x}$$

Answer = 20

97)

a, b ප්‍රත්‍යාග්‍ය

$$a+b = 12, ab = 35, \frac{1}{a} + \frac{1}{b} = ?$$

$$\frac{1}{2}) \frac{a+b}{ab} = \frac{12}{35}$$

$$\frac{a}{ab} + \frac{b}{ab} = \frac{1}{b} + \frac{1}{a} = \frac{12}{35}$$

$$= \frac{12}{35} \rightarrow \text{Answer}$$

$$98 \quad \text{No. of } x = x$$

$$\frac{3}{5} \times 60\% \times x = 36$$

$$\frac{3}{5} \times \frac{3}{5} \times x = 36$$

$$x = 100$$

$$99 \quad \text{பாகீ} = a, \text{ விளம்பு} = \frac{1}{a}$$

$$a - \frac{1}{a} = \frac{9}{20}$$

(A)  $\frac{\text{பாகீ}}{\text{விளம்பு}} = \frac{3}{5} - \frac{5}{3} =$

(B)  $\frac{3}{10} - \frac{10}{3} =$

(C)  $\frac{4}{5} - \frac{5}{4} = \frac{-9}{20}$

$\checkmark$  (D)  $\frac{5}{4} - \frac{4}{5} = \frac{9}{20}$

(OR)

$$\frac{a^2 - 1}{a} = \frac{9}{20}$$

$$20a^2 - 20 = 9a$$

$$20a^2 - 9a - 20 = 0$$

$$20a^2 - 25a + 16a - 20 = 0$$

$$5a(4a-5) + 4(4a-5) = 0$$

$$(4a-5)(5a+4) = 0$$

$$a = \frac{5}{4} \Rightarrow a = \frac{4}{5}$$

100  $\text{தொகை} = \frac{2272}{-875} = \frac{1397}{11 \times 27}$

$$N = 11 \quad (27)$$

$$1+2+7 = 10$$

101  $\text{No. of } x = 333 \dots$

$$7) \begin{array}{r} 33333 \\ \underline{-28} \\ 53 \\ \underline{-49} \\ 43 \\ \underline{-42} \\ 13 \\ \underline{-7} \\ 63 \\ \underline{-63} \\ x \end{array} (47619)$$

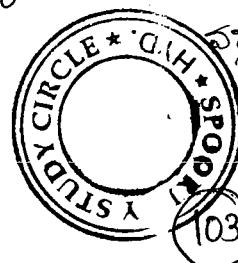
102

$2, 4$	$4, 6$	$6, 8$	$8, 10$
$4^2 - 2^2$	$6^2 - 4^2$	$8^2 - 6^2$	$10^2 - 8^2$
$(6)(2)$	$(10)(2)$	$(14)(2)$	$(18)(2)$

மதில்தூண் 4' மானி Common Factors

(OR)

$$\text{எல்லோ} 2x, 2x+2$$



103

$1, 3$	$3, 5$	$5, 7$	$8 \text{ முனிகி}$
$= 3^2 - 1^2$	$= 5^2 - 3^2$	$= 7^2 - 5^2$	Common நடை
$= (4)(2)$	$= (8)(2)$	$= (12)(2)$	
$= 8$	$= 16$	$= 24$	

ஒருங்கிணங்கும்  $2x+1, 2x+3$

$$\text{ஏதால் திடு} = (2x+3)^2 - (2x+1)^2$$

$$= 4x^2 + 12x + 9 - 4x^2 - 4x - 1$$

$$= 8x + 8$$

$$= 8(x+1)$$

So Answer is = 8

104

$$6n^2 + 6n$$

$$n=1$$

$$= 6 \times 1^2 + 6 \times 1$$

$$= 12$$

$$n=2$$

$$= 6 \times 2^2 + 6 \times 2$$

$$= 24 + 12$$

$$= 36$$

$$n=3$$

$$= 6 \times 3^2 + 6 \times 3$$

$$= 54 + 18$$

$$= 72$$

$$\textcircled{1} (x^n - y^n) (n-\text{సంఖ్య}) \leftarrow (x-y) \text{ ను}$$

కొఱకొఱ అవుతుంది.

$$\textcircled{2} (x^n - y^n) (n-\text{సంఖ్య}) \leftarrow (x+y) \text{ ను కొఱకొఱ అవుతుంది.}$$

107

$$= (49^{15} - 1)$$

$$= (49^{15} - 1^{15})$$

$$(x^n - y^n) (n-\text{సంఖ్య}) (x-y) \text{ అనుభంగించి}$$

ను కొఱకొఱ అవుతుంది.

$$* (49-1) = 48 \text{ ను కొఱకొఱ అవుతుంది.}$$

\* 8 అంశిక్కాడు - ఈ ప్రశ్నగాంచు - Answer అవుతుంది.

48 కే కొఱకొఱ అన్నాడు - నష్టాన్ని వీళ్లించి భద్రతాయి.

108

$$(x^n - a^n) \text{ కు } (x-a)^n \text{ కొఱకొఱ అవుతాయి}$$

- సంఖ్యా - కుంటాయి. n - సంఖ్యలను

109

$$\frac{17^{200}}{18}$$

$$= \frac{17 \times 17 \times 17 \times \dots \times 17}{18} (200 \text{ సిఱ్పు})$$

$$= \frac{-1 \times -1 \times -1 \times \dots \times -1}{18} (200 \text{ సిఱ్పు})$$

$$= \frac{1}{18} \rightarrow \text{కేసు} \Rightarrow \text{కేసు} = 1$$

$$1. x^1 + y^1 = x+y$$

$$2. x^2 + y^2 = -$$

$$3. x^3 + y^3 = (x+y)(x^2 - xy + y^2)$$

$$*(x^n + y^n) \leftarrow [n-\text{సంఖ్య}] \text{ అవుతుంది } (x+y)$$

ను కొఱకొఱ అవుతుంది.

$$x^1 - y^1 = x-y$$

$$x^2 - y^2 = (x-y)(x+y)$$

$$x^3 - y^3 = (x-y)(x^2 + xy + y^2)$$

$$x^4 - y^4 = (x-y)(x+y)(x^2 + y^2)$$

(110)  $\left( \begin{matrix} 43 & 43 \\ 47 & 43 \end{matrix} \right), \left( \begin{matrix} 47 & 47 \\ 47 & 43 \end{matrix} \right)$

$x^n + y^n$	$x^n + y^n$
$n = \text{చేసి} (43)$	$n = \text{చేసి} (47)$
$(x+y) \text{ కారణాంశం}$	$(x+y) \text{ కారణాంశం}$
$(47+43) \parallel$	$(47+43) \parallel$

(111)  $= 2^{96} + 1$   
 $= (2^{32})^3 + 1^3$   
 $x^n + y^n \rightarrow n \text{ చేసినట్టు} \{3\}, (2^{32} + 1)$

కీ కారణాంశం అవుతుంది.

(112)  $= 4^{61} + 4^{62} + 4^{63} + 4^{64}$   
 $= 4^{61} (1 + 4 + 4^2 + 4^3)$   
 $= 4^{61} (1 + 4 + 16 + 64)$   
 $= 4^{61} (85)$   
 $= 4^{60} \times 4 (17 \times 5)$   
 $= (2 \times 5) = 10 \text{ కారణాంశం.}$

(113)  $= 3^{25} + 3^{26} + 3^{27} + 3^{28}$   
 $= 3^{25} (1 + 3 + 3^2 + 3^3)$   
 $= 3^{25} (1 + 3 + 9 + 27)$   
 $= 3^{25} (40)$   
 $= 3^{24} \times 3 (4 \times 10)$   
 $30$

కీ కారణాంశం, 30 కు లోగిం కీ కారణాంశం అవుతుంది.

(114) 
$$\begin{array}{r} 4 \ a \ 3 \\ + 9 \ 8 \ 4 \\ \hline 13 \ b \ 7 \end{array} \rightarrow \text{II గుణాలు}$$

$a+8 = b$   
 $0+8 = 8 \Rightarrow a=0, b=8 \times$   
 $1+8 = 9 \Rightarrow a=1, b=9 \checkmark$   
 $b = 8 \text{ అంటే } \begin{array}{c} 3 \\ 8 \\ 7 \end{array} \times$   
 $b = 9 \text{ అంటే } \begin{array}{c} 1 \\ 3 \\ 9 \\ 7 \end{array} \checkmark$   
 కొత్త  $a+b = 1+9 = 10$

(115)  $3x + 7y \text{ అన్ని } \text{II గుణాలు}$



$x=5, y=1, \text{ అనుకూలము.}$

$$\begin{aligned} &= 3(5) + 7(1) \\ &= 22 \end{aligned}$$

Option d is  $\checkmark$

- (a)  $4(5)+1 = 21$
- (b)  $5+1+4 = 10$
- (c)  $9(5)+4(1) = 49$
- (d)  $4(5)+9(1) = 11$

(116)  $653 \times \boxed{y} \rightarrow \text{సమాధి} y=0$

$\begin{array}{r} 9 \\ 9 \\ 10 \end{array}$

$653 \times$   
 $6+5+3+x = 14+x$  9-చే ఫీడింగ్ బడ్జెట.  
 $x=4$

$x+y = 4+0 = 4$

(117) నొఫ్యూషన్ పంటలపుత్రం

~~9, 12, 18, 9, 21, 12, 18, 21, 15, 24~~

మొత్తం 6 సోఫ్ట్‌వెర్ తగ్గిపై

(118)  $\text{LCM}_3 \mid 3, 7, 9, 11$

$$1 + 3 \parallel$$

$$= 63 \times 11$$

$$= 693$$

$$\text{కొత్త సంఖ్య} = 693 \times [k] \quad [k=1, 2, 3, \dots]$$

$$k=1 \Rightarrow 693 \times 1 = 693$$

$$k=2 \Rightarrow 693 \times 2 = 1386$$

$$k=3 \Rightarrow 693 \times 3 = 2079$$

(OR)

$$= 3 \times 7 \times 9 \times 11$$

$$\begin{array}{r} 1 \\ 99 \times 21 \\ \hline 99 \\ 198 \\ \hline 2079 \end{array}$$

$$= 99 \times 21$$

$$= 2079$$

(119) Same as 63 Question. in Reg Book

(120)

$$\text{శేషాంగి కీమి} = 3$$

వ్యాప్తిలో విద్యుత్ చుక్క

$$\text{సంఖ్య} = 9 \text{ అంటుమా}$$

$$\text{సంఖ్యావర్ధమా} = 9^2 = 81$$

$$6) 81 (13$$

$$\frac{78}{\overline{810}} \quad 3$$

(OR)

$$\left. \begin{array}{l} 6) N(2 \\ \hline 3 \\ N = 62 + 3 \\ 62^2 = (62+3)^2 \\ = 362^2 + 362 + 2 \\ 6 \text{ శేషాంగి} = \\ \frac{362^2}{6} + \frac{362}{6} + \frac{2}{6} \\ \overline{810} \quad 3 \end{array} \right.$$



1, 2, 3, ...

$$585) 584 ($$

$$\overline{585} = 584$$

ఒచ్చనంఖ్య విభజించి  
ఉచ్చములు తె  
పరిశీలించుతుండి

(121) \*Imp

$$4, 5 \text{ శేషాంగి}$$

$$4) N(2$$

$$\frac{1}{\overline{1}}$$

$$N = 42_1 + 1$$

$$2_1 = 1, N = 5$$

$$2_1 = 2, (N = 9)$$

$$N(1, 1, 4)$$

$$5) 9 ($$

$$\frac{4}{\overline{52}} + 4$$

$$5) 9 ( \quad 4) 9 ($$

$$\frac{4}{\overline{4}}$$

$$\frac{1}{\overline{1}}$$

(122)

$$4, 5, 6 \text{ శేషాంగి}$$

$$2, 3, 4$$

$$\text{కొత్త సంఖ్య} = \text{LCM}(4, 5, 6) \times k - 2$$

$$= 60k - 2$$

$k = 1, 2, 3, 4, \dots$

$$k = 1 \Rightarrow 60 \times 1 - 2 = 58$$

Answer is NOTA

(123)

$$5, 9, 13 \text{ శేషాంగి}$$

$$4, 8, 12$$

$$\text{కొత్త సంఖ్య} = \text{LCM}(5, 9, 13) \times k - 1$$

$$= 585 \times k - 1$$

90 with options

$$A) 339$$

$$\begin{array}{r} 339 \\ \hline 13 \\ \times \end{array}$$

$$B) 349$$

$$\begin{array}{r} 349 \\ \hline 13 \\ \times \end{array}$$

$$C) 369$$

$$\begin{array}{r} 369 \\ \hline 13 \\ \times \end{array}$$

$$13) N(2_1)$$

$$\frac{1}{\overline{11}}$$

$$2_1 = 26 \text{ ఉపాంగి}$$

$$= 13 \times 26 \times 11$$

$$= 349$$

$$17) N(2_2)$$

$$\frac{1}{\overline{9}}$$

(125)

296) N (2

$$\frac{75}{}$$

$$N = 2962 + 75$$

$$37 \text{ ఫ్రె} = \frac{2962}{37} + \frac{75}{37} = 80 = 1$$

(126)

3 7		55	36	81	(3) (7)
		(A) 55	51	81	X
		(B) 55	56	81	X
		✓ (C) 55	56	81	✓ ✓
		(D) 55	65	81	✓ X

\*\*

127 To 131 Repeated Questions

\*\*

$$\begin{aligned}
 &= 1 - \frac{1}{n} + 1 - \frac{2}{n} + 1 - \frac{3}{n} + \dots \\
 &= (1+1+1+\dots+n) - \frac{1}{n}(1+2+3+\dots+n) \\
 &= n - \frac{1}{n} \left( \frac{n(n+1)}{2} \right) \\
 &= \frac{2n-n-1}{2} \\
 &= \frac{n-1}{2}
 \end{aligned}$$

(133) 23,100 మధ్య 6 చే ఫోన్యూప్లిస్టులు

24,30,36, ..., 96

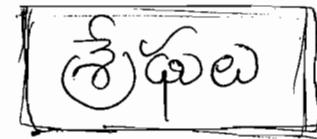
$$\text{ఏప్లిఫాటు} = \frac{\text{Last} - \text{First}}{\text{diff}} + 1$$

$$= \frac{96-24}{6} + 1$$

$$= \frac{72}{6} + 1$$

$$= 12 + 1$$

$$= 13$$



1) అంతరీక్షిఫలః (Arithmetic Progression)

$$2, 5, 8, 11, \dots$$

$$\begin{array}{ccccccc}
 a, & a+d, & a+2d, & a+3d, & \dots & a+(n-1)d \\
 \downarrow & \downarrow & \downarrow & \downarrow & \ddots & \downarrow \\
 t_1 & t_2 & t_3 & t_4 & \dots & t_n
 \end{array}$$

$$1) \text{ గచఛడం } t_n/l = a + (n-1)d$$

$$\begin{aligned}
 2) \text{ గచఛలమొత్తం} &= \frac{n}{2} (2a + (n-1)d) \\
 &= \frac{n}{2} (a + l)
 \end{aligned}$$

2). గుణశ్రీఫలః (Geometric Progression)

$$2, 6, 18, 54, \dots$$

$$\begin{array}{ccccccc}
 a, & ar, & ar^2, & ar^3, & \dots & ar^{n-1} \\
 \times r & \times r & \times r & \times r & \ddots & \downarrow \\
 t_1 & t_2 & t_3 & t_4 & \dots & t_n
 \end{array}$$

$$\text{గచఛడం / గచఛలమొత్తం } t_n = a \cdot r^{n-1}$$

$$\begin{aligned}
 2) \text{ గచఛలమొత్తం} &= \frac{a(r^n - 1)}{r - 1} \quad \begin{bmatrix} \text{ప్రస్తావించి} \\ \text{ప్రాచీనమై} \end{bmatrix} \\
 &= a \frac{(1^n - r^n)}{1 - r} \quad \begin{bmatrix} \text{ప్రస్తావించి} \\ \text{ప్రాచీనమై} \end{bmatrix}
 \end{aligned}$$

$$3) \text{ గుణశ్రీఫలమొత్తం} = \frac{a}{1 - r}$$

3). వంరాత్మకశ్రీఫలః (Harmonic)

$$a, b, c \text{ లో వంరాత్మకశ్రీఫలి - ద్వాచి } \frac{1}{a}, \frac{1}{b}, \frac{1}{c}$$

ఉపాయశ్రీఫలి - ద్వాచి.

	<u>గొయవుశ్వం (A.m)</u>	<u>వరావుశ్వం (G.m)</u>	<u>వ్యరత్ముశుశ్వం (H.m)</u>
$ab \text{ సంఖ్యలు} \Rightarrow$	$\frac{a+b}{2} \geq \sqrt{ab}$	$\sqrt{ab} \geq \frac{2ab}{a+b}$	
$16, 4 \Rightarrow$	$\frac{16+4}{2} = 10$	$\sqrt{16 \times 4} = 8$	$\frac{2 \times 16 \times 4}{16+4} = \frac{2 \times 64}{20} = 6.4$

\*\*\*

34) 5 చే ఫసిచుట్కి 2 అడల సంఖ్యల

10, 15, 20, ----- 95

$$n = \frac{l-F}{d} + 1 = \frac{95-10}{5} + 1 \Rightarrow 18$$

$$\text{అంతిమ గండుల ప్రాథమికమైన సూటి} = \frac{n}{2} (a+l)$$

$$= \frac{18}{2} (10+95)$$

$$= (105) 9$$

$$= 945$$

$$\Rightarrow l = n-1$$

$$n = 8$$

(137)

$$2 + 2^2 + 2^3 + \dots + 2^9$$

$$\underbrace{2}_x, \underbrace{2^2}_x, \underbrace{2^3}_x, \dots, 2^9$$

$$\text{సూటిక్కిటింటి గండుల ప్రాథమికమైన సూటి} = a \left( \frac{r^n - 1^n}{r-1} \right)$$

$$= 2 \left( \frac{2^9 - 1}{2-1} \right)$$

$$= 2(512-1)$$

$$= 2(511)$$

$$= 1022$$



$$1800 = \frac{n}{2} (2 \times 6 + (n-1) 6)$$

$$1800 = n (6 + (n-1) 6)$$

$$1^2 + 2^2 + 3^2 + 10^2 + \dots + 10^2$$

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

$$= \frac{10(11)(21)}{6}$$

$$= 385$$

$$3, 6, 12, 24, \dots, 384$$

$$\text{గండు} t_n = a \cdot r^{n-1}$$

$$\frac{384}{3} = 2 \cdot 2^{n-1}$$

$$2^7 = 2^{n-1}$$

$x=3$
$r=2$

Formula's

$$1) 1^2 + 4^2 + 6^2 + \dots + m^2 \quad (n \text{ নাম্বাৰ})$$

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

$$2) 1^2 + 3^2 + 5^2 + \dots + m^2 \quad (n \text{ নাম্বাৰ})$$

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


---

(189)

$$1^2 + 4^2 + 6^2 + \dots + 20^2 \quad (m^2)$$

$$= \frac{10(21)(22)}{6} \cancel{\times}_1$$

$$= 1540$$



(140)

$$= 11^2 + 12^2 + 13^2 + \dots + 20^2$$

$$= (1^2 + 2^2 + 3^2 + \dots + 20^2) - (1^2 + 2^2 + 3^2 + \dots + 10^2)$$

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

$$= \frac{20(21)(41)}{6} \cancel{\times}_1 - \frac{10(11)(21)}{6} \cancel{\times}_1$$

$$= 2870 - 385$$

$$= 2465$$

## LCM & HCF

$$\textcircled{1} \quad 35, 105, 175 \text{ @ } \text{సెంగ}, \text{గెంఘా = ?}$$

5	35, 105, 175
7	7      21      35
$\overline{5 \times 7 = 35}$	1      3      5

$$\text{क्षेत्रफल} = 5 \times 7 \times 3 \times 5 \\ = 525$$

\* \* —

$$N = a^p \times b^q \times c^r \dots \dots \quad (abc \text{ မြန်မာစာ }) \quad (5)$$

$$\text{সূত্রটির সংজ্ঞা} = (p+1)(q+1)(r+1) \dots$$

$$24 = 2^3 \times 3^1$$

$$\begin{aligned} \text{కొవలసిన నంద్రాల్ } &= (3+1)(1+1) \\ &= (4)(2) \\ &= 8 \end{aligned}$$

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



$$\frac{128352}{238368} = \frac{\cancel{18336} \times 7}{\cancel{18336} \times 13} = \frac{7}{13}$$

6

$$2^2 \times 3^3 \times 5^5$$

$$2^3 \times 3^2 \times 5^2 \times 7$$

$$2^4 \times 3^4 \times 5 \times 7^2 \times 11$$

$$\text{HCF} = 2^2 \times 3^2 \times 5$$

十

$$\text{HCF} = 3 \times 5 \times 7 = 105$$

ଓଡ଼ିଆ ଲେଖକ ହାତରେ ପାଇଁ ଏକ ମହାନ୍ ଲେଖକ ହେଉଥିଲା

8

$$= 4 \times 5 \times 9$$

$$= 180$$

8

8

$$= 4 \times 5 \times 9$$

$$= 180$$

9)  $HCF \Rightarrow$

4	36, 84
3	9    21
	3    7

$HCF = 12$

\* కసాగు = గంప్య ఘతకం దేను నంభుల లభ్యము  
అవుటి.

10)  $\begin{array}{r} 17 \\ \hline 204, 1190, 1445 \\ \hline 12, 70, 85 \end{array}$   
 $HCF$

\*\*\*

నవోదాన సంఖ్యలు

\* వీరండు సంఖ్యల ప్రాథమిక గ.స.భీ 1 అయితే వాటిరో  
ఫో తథాన సంఖ్యల అంచురు. (800డు  
సంఖ్యల తథాన సంఖ్యల కొనునరంలేదు).

\*\*\*

11) A) 16, 62      B) 18, 25  
 $HCF = 2$        $HCF = 1$   
 C) 21, 35      D) 23, 92  
 $HCF = 7$        $HCF = 23$ .



16)  $\begin{array}{r} 2, 22, 54, 108, 135, 198 \\ 3, 11, 27, 54, 135, 99 \\ 3, 11, 9, 18, 45, 33 \\ 3, 11, 3, 6, 15, 11 \\ 11, 1, 2, 5, 11 \\ \hline 1, 1, 2, 5, 11 \\ 54 \times 11 \times 10 \\ = 5940 \end{array}$

17)  $= 37 \begin{array}{r} 148, 185 \\ 4, 5 \end{array}$

$LCM = 37 \times 4 \times 5 = 740$

18)  $\begin{array}{l} \text{గసాగు} = \frac{\text{ఉపా రసాయన}}{\text{ప్రతిష్ఠాతమ రసాయన}} \\ = \frac{HCF(2, 8, 64, 10)}{LCM(3, 9, 81, 27)} \\ = \frac{2}{81} \end{array}$

12)  $2923 \begin{array}{r} 3239(1 \\ -2923 \\ \hline 316) 2923(9 \\ -2844 \\ \hline 79) 316(4 \\ -316 \\ \hline 0 \end{array}$   
 $\text{HCF} \leftarrow$

13)  $3444 \begin{array}{r} 3556(1 \\ -3444 \\ \hline \times 112) 3444(3 \\ -336 \\ \hline 84) 112(1 \\ -84 \\ \hline 28) 84(3 \\ -84 \\ \hline 0 \end{array}$   
 $\text{HCF} \leftarrow$

$$\begin{aligned}
 19) \quad \text{గ්‍රන්ථ} &= \frac{\text{ප්‍රංශ ර්‍යාඛා}}{\text{ව්‍යුත් ක්‍රියා}} \\
 &= \underline{\text{HCF}(9, 12, 18, 21)} \\
 &= \underline{\text{Lcm}(10, 25, 35, 40)} \\
 &= \frac{3}{1400}
 \end{aligned}$$

R.S booker තේවු ඇත.

$$\begin{array}{r}
 2 | 10, 25, 35, 40 \\
 5 | 5, 25, 35, 20 \\
 \hline
 15, 7, 4 \\
 = 1400
 \end{array}$$

$$\begin{aligned}
 20) \quad \text{ක්‍රියා} &= \frac{\text{ව්‍යුත් ක්‍රියා}}{\text{ප්‍රංශ ර්‍යාඛා}} \\
 &= \underline{\text{Lcm}(15, 24)} \\
 &= \underline{\text{HCF}(3, 6, 9, 7)} \\
 &= \frac{20}{3}
 \end{aligned}$$

$$\begin{aligned}
 21) \quad \text{Lcm} &= \underline{\text{Lcm}(2, 3, 4, 9)} \\
 &= \underline{\text{Hcf}(3, 5, 7, 13)} \\
 &= \frac{36}{1}
 \end{aligned}$$

$$22) \quad \text{ර්යාඛා} (1.75, 5.6, 7) \times 100 \xrightarrow{\text{සිදු}}$$

$$\begin{array}{r}
 7 | 175, 560, 700 \\
 5 | 25, 80, 100 \\
 \hline
 5, 16, 20
 \end{array}$$

100 ත්‍රේ ර්‍යාඛා මාලා 100 ත්‍රේ ප්‍රධාන මාලා.

$$\text{Hcf} = \frac{35}{100} = 0.35$$

$$23) \quad (1.08, 0.36, 0.9) \times 100 \xrightarrow{\text{සිදු}}$$

$$\begin{array}{r}
 9 | 108, 36, 90 \\
 2 | 12, 4, 10 \\
 \hline
 6, 2, 5
 \end{array}$$

$$\text{Hcf} = \frac{18}{100} \Rightarrow 0.18$$

$$24) (0.54, 1.8, 7.2) \times 100 \xrightarrow{\text{සිදු}}$$

$$\begin{array}{r}
 18 | 54, 180, 720 \\
 3 | 3, 10, 40
 \end{array}$$

$$\text{Hcf} = 18 \Rightarrow \frac{18}{100} = 0.18$$

$$25) (3, 2.7, 0.09) \times 100 \xrightarrow{\text{සිදු}}$$

$$\begin{array}{r}
 2 | 300, 270, 9 \\
 3 | 150, 135, 9 \\
 3 | 50, 45, 3 \\
 5 | 50, 15, 1 \\
 10, 3, 1
 \end{array}$$

$$\text{Lcm} = 2700 \Rightarrow \frac{2700}{100} = 27$$



$$26) 3240, 3600, x$$

$$\text{Hcf} = 36 \quad \text{Lcm} = 2^4 \times 3^5 \times 5^2 \times 7^2$$

$$\text{Lcm} = 2^2 \times 3^2 \times 2^2 \times 3^2 \times 5^2 \times 7^2$$

$$= 2^3 \times 3^4 \times 5, 2^4 \times 3^2 \times 5^2, x$$

$$= \cancel{2^2 \times 3^2} \times \cancel{2^2 \times 3^2 \times 5} \times \cancel{2^2 \times 3^2} \times \cancel{2^2 \times 25} = \cancel{2^2 \times 3^2} \times \cancel{3^2 \times 7^2}$$

$$= 2^2 \times 3^5 \times 7^2$$

$$27) 1 : 2 : 3$$

$$1x, 2x, 3x$$

$$\begin{array}{r}
 x | 1x, 2x, 3x \\
 \hline
 1, 2, 3
 \end{array}$$

$$\text{Hcf} = 12$$

$$= 1 \times 12, 2 \times 12, 3 \times 12$$

$$= 12, 24, 36$$

(28)  $3 : 4$   
 $3x, 4x$

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

HCF  $3, 4$

$HCF = x = 4$   
 $LCM = 12x = 12 \times 4 = 48$

(29)  $a, b$   
 $27x, 27y$   
 $27x + 27y = 216$   
 $27(x+y) = 216$   
 $x+y = 8$

✓ Option (A)  $\rightarrow 27, 189$   
 $27 \times 1 \quad 27 \times 7$   
Co-primes.

Option (C)  $\rightarrow 270, 108$   
 $27 \times 4 \quad 27 \times 4$   
Not Co-primes.

(30)  $33x, 33y$   
 $33x + 33y = 528$   
 $33(3x+y) = 528$   
 $x+y = 16$

$1+5 = 16$   
 $2+4 = 16$   
 $3+13 = 16$  ✓ నాల్గు తెలుగు  
 $4+12 = 16$  నాల్గు తెలుగు  
 $5+11 = 16$   
 $6+10 = 16$   
 $7+9 = 16$   
 $8+8 = 16$

కొత్తవేద్య విషయ  
Not Co-primes

(31)  $45, 60, 75, 90$

HCF

$(45, 60) 15$	$(60, 75) 15$	$(75, 90) 15$
$(45, 75) 15$	$(60, 90) 30$	
$(45, 90) 45$		

Total = 4

(32) HCF = 12  
12 లక్ష రూపాయిల ప్రశ్నల.

Option (D)  $\rightarrow 84, 96$

(33)  $37x, 37y$  లక్ష.  
 $37x \times 37y = \overbrace{4107}^{111^3}$   
 $xy = 3$   
 $xy = 3 \times 1$   
 $37 \times 3, 37 \times 1$

(34) (11), 37  
ప్రశ్నలు

$13x, 13y$   
 $13x \times 13y = \overbrace{156}^{2028}$   
 $xy = 12$

$3 \times 4 = 12$   
 $1 \times 12 = 12$   
 $2 \times 6 = 12$

(35)  $a, b, c$  అధిన లభ్యమ.  
 $\rightarrow \frac{ab}{bc} = \frac{551}{1073} = \frac{19 \times 29}{29 \times 37}$   
 $\rightarrow 19, 29, 37$   
ప్రశ్న =  $19 + 29 + 37 = 85$

36

$$2x, 3x$$

$$x \mid 2x, 3x$$

2 3

$$\text{Lcm} = 6x = 48$$

$$x = 8$$

$$\text{వ్యతిరేకం} = 2x + 3x = 5x = 5 \times 8 = 40$$

37

$$x \mid 3x, 4x, 5x$$

3, 4, 5

$$\text{Lcm} = 60x = 240$$

$$\text{HCF} = x = 40$$

సాధారణములలో  $a, b$  అనికి వాటియాగిల్చింది

$$axb = \text{Lcm} \times \text{HCF}$$

38

$$b = 77 \times 4$$

$$= 308$$

39

$$\text{సాధారణముల వ్యతిరేకం} = 2000$$

$$\begin{array}{ll} 1^{\text{st}} & 2^{\text{nd}} \\ x & (2000-x) \end{array}$$

$$axb = \text{Lcm} \times \text{HCF}$$

$$x(2000-x) = 21879 \times \text{HCF}$$

(All options HCF = 1)

$$x(2000-x) = 21879 \times 1$$

Go with Options.

$$= 1989 \times 11$$

$$= 21879$$

40

$$1x, 8x$$

$$axb = \text{Lcm} \times \text{HCF}$$

$$1x \times 8x = 21 \times \frac{21}{84}$$

$$x^2 = 21^2$$

$$x = 21$$

$$\text{వ్యతిరేకం} = 4 \times 21 = 84$$

41

$$5x, 54$$

$$5 \mid 5x, 54$$

$$\text{Lcm} = 5xy = 495$$

$$xy = 99$$

$$xy = 11 \times 9$$

$$5x+54 = 100$$

$$5(x+y) = 100$$

$$x+y = 20$$

$$11+9 = 20$$

$$\Rightarrow 5 \times 11, 5 \times 9$$

$$\Rightarrow 55, 45$$

$$\text{ఫ్రెడో} = 10$$

$$axb = \text{Lcm} \times \text{HCF}$$

$$\begin{array}{l} axb \\ \uparrow \quad \uparrow \\ \text{ఫ్రెడో} = 2 \end{array}$$

Option(b)  $\rightarrow$  6, 4

43

$$a, b$$

$$a+b = 55$$

$\rightarrow ①$

$$axb = \text{Lcm} \times \text{HCF}$$

$$axb = 120 \times 5$$

$$ab = 600$$

$\rightarrow ②$

$$\frac{1}{2} = \frac{a+b}{ab} = \frac{55}{600}$$

$$\frac{1}{b} + \frac{1}{a} = \frac{11}{120}$$

(44)

$$\begin{array}{ll} \text{Lcm} & \text{HCF} \\ 45x & x \\ 45 \times 25 & 25 \end{array}$$

$$300 = 45x + x = 150$$

$$46x = \frac{150}{50}$$

$$x = 25$$

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

$$\begin{aligned} 125 \times b &= 45 \times 25 \times 25, \\ &= 45 \times 5 \\ &= 225 \end{aligned}$$

(45)

$$\begin{array}{ll} 2) a (50) & a \times b = \text{Lcm} \times \text{HCF} \\ \hline 0 & 100 \times b = 50 \times 250 \\ a = 2 \times 50 + 0 & b = 125 \\ a = 100 & \end{array}$$

(46)  $a \times b = \text{Lcm} \times \text{HCF}$

$$\begin{aligned} 1320 &= \text{Lcm} \times 6 \\ \text{Lcm} &= 220 \end{aligned}$$



(47) సహాదీనసమ్మానం = గణభా = 1

$$\begin{aligned} a \times b &= \text{Lcm} \times \text{HCF} \\ 117 &= \text{Lcm} \times 1 \\ \text{Lcm} &= 117 \end{aligned}$$

(48) HCF is a factor of LCM  
గణభా అనుభంగికాలు కోసం  
120 & 35 అనుభంగికాలు.  
35 HCF కాదు.

(49) 60 & 8 కోసం కాదు.  
60 LCM కాదు.

(50)

$$23x, 23y$$

$$23 \boxed{23x, 23y}$$

$$x, y$$

$$\text{Lcm} = 23xy$$

$$\text{LCM} = \text{HCF} \times \text{విధిశ్రుతిప్రచారము}$$

$$23xy = 23 \times 13 \times 14$$

$$xy = 13 \times 14$$

$$\text{కొల్పానసమ్మానం = } \boxed{23 \times 14}, 23 \times 13$$

322

(51)

$$\text{Lcm} = \text{HCF} \times \text{విధిశ్రుతిప్రచారము}$$

$$136 = 16 \times \underline{\quad}$$

16 అన్ని 136 కి కోసం కాదు. కొల్పానసమ్మానం కాదు.

(52) కోసం సమ్మానం  $11x, 11y$

$$11 \boxed{11x, 11y}$$

$$x, y$$

$$\text{Lcm} = 11xy = \frac{35}{35}$$

$$xy = 35$$

$$x, y = 35$$

$$1 \times 35 = 35$$

$$5 \times 7 = 35$$

$$\text{కొల్పానసమ్మానం } 11 \times 1, 11 \times 35$$

$$11, 385$$

కాదు

$$11 \times 5, 11 \times 7$$

$$55, \boxed{77}$$

(53)

$$29x, 29y$$

$$29 \boxed{29x, 29y}$$

$$x, y$$

$$\text{Lcm} = 29xy = \frac{143}{4147}$$

$$xy = 143$$

$$x, y = 143$$

$$1 \times 143 = 143$$

$$11 \times 13 = 143$$

$$\text{కొల్పానసమ్మానం}$$

$$29 \times 1, 29 \times 143$$

కాదు

$$29 \times 11, 29 \times 13$$

$$\text{తెఱ్టి} = 29 \times 11 + 29 \times 13 = 29(24) = 696$$

54)  $x, y$  అధనవిష్యాలు HCF = ?

$$x \times y = \text{LCM} \times \text{HCF}$$

$$x \times y = 161 \times 1$$

$$x \times y = 161$$

$$\begin{aligned} x \times y &= 161 \\ 161 \times 1 &= 161 \times \\ 23 \times 7 &= 161 \vee (x > y) \\ - 3y - x & \\ = 3(1) - 23 & \\ = 21 - 23 & \\ = -2 & \end{aligned}$$

55)

$$7 \left| \begin{array}{r} 105, 1001, 2436 \\ 15, 143, 348 \end{array} \right.$$

$$\text{HCF} = 7$$

56)

$$7m, 3m 85cm, 12m 95cm$$

$$\begin{array}{c} 5 \left| \begin{array}{r} 700\text{cm}, 385\text{cm}, 1295\text{cm} \\ 140, 77, 259 \end{array} \right. \\ 20, 11, 37 \end{array}$$

$$\text{HCF} = 5 \times 7 = 35\text{ cm.}$$

57) HCF  $496, 403, 713$

పోటిఫోన్ @ 1 X

(b) 7 X

(c) 31 V

$496, 403, 713$  లక్షిం '31' కి భేదించబడ్డాయి

$$\text{HCF} = 31$$

58)  $1001, 910$  ని అగ్రించేలా లేదా సంఖ్య (HCF)

$$91 \left| \begin{array}{r} 1001, 910 \\ 11, 10 \end{array} \right.$$

పెన్సులు సంఖ్య  
పెన్సులు సంఖ్య  
pens pencils

62)  $136 \times 153$  కొత్తవారల ఒడిర్చుచుటకు కొదలు చుట్టూ బండలను వచ్చే, తొఱున క్రమపు బండల సంఖ్య ఎంత?

$$17 \left| \begin{array}{r} 153, 136 \\ 9, 8 \end{array} \right.$$

HCF

$$\begin{aligned} \text{పండితసంఖ్య} &= \frac{\text{గొట్ట తేచ్చాయా}}{\text{నైచ్చ బండక్కి తేచ్చాయా}} \\ &= \frac{153 \times 136}{17 \times 17} = 72 \end{aligned}$$

63)

$105, 175, 700$  ల వాడురాల స్తోంలు లను రెలపమండె బాటు క్రమపు దచ్చులలో కొండవచ్చు (సవొసపచ్చాంగల ఉచ్చుల)?

$$35 \left| \begin{array}{r} 105, 175, 700 \\ 3, 5, 20 \end{array} \right.$$

$$\text{క్రమపు దచ్చుల కొండు} = 3+5+20 = 28$$

59)

(i) కొండు పంచాంగమ = 21 (HCF)



$$7 \left| \begin{array}{r} 378\text{cm}, 525\text{cm} \\ 54, 75 \end{array} \right. \\ 18, 25 \\ \text{HCF} = 7 \times 3 \\ = 21$$

$$(ii) \text{పంచాంగ సంఖ్య} = \frac{\text{గొట్ట తేచ్చాయా}}{\text{నైచ్చ పంచాంగ తేచ్చాయా}}$$

$$= \frac{378 \times 525}{21 \times 21}$$

$$= 18 \times 25$$

$$= 450$$

(60) వేషం సవరణ

$$\text{HCF } \boxed{4} \mid 48, 92, 190$$

$\downarrow$   
HCF      12, 23, 35

(61) వేషం సవరణ

$$\begin{array}{c|ccc} 10 & 3360, 2240, 5600 \\ \hline 4 & 336 & 224 & 560 \\ \hline 4 & 84 & 56 & 140 \\ \hline 7 & 12 & 14 & 35 \\ & 3 & 2 & 5 \end{array}$$

$$\text{HCF} = 10 \times 4 \times 4 \times 7 = 1120$$

$$\text{మొత్తమాత్ర} = 1+1+2+0 = 4$$

(62)

$$\begin{array}{c|ccc} 1356, & 1868, & 2764, \\ \hline -12 & \hline 1344 & 1856 & 2752 \\ \hline & & & \end{array}$$

$$\begin{array}{c|ccc} 4 & 1344, 1856, 2752 \\ \hline 4 & 336, 464, 688 \\ \hline 4 & 84, 116, 172 \\ \hline & 21, 29, 43 \\ \hline & & & \end{array}$$

$\downarrow$   
HCF

$$\text{HCF} = 4 \times 4 \times 4 = 64$$

(63)

$$\begin{array}{r} 1657 \\ -6 \\ \hline 1651 \end{array} \quad \begin{array}{r} 2037 \\ -5 \\ \hline 2032 \end{array}$$

$$127 \mid \boxed{1651, 2032}$$

13, 16

$$\text{HCF} = 127.$$

(64)  $\frac{1}{8}, \frac{13}{16}, \frac{31}{40}, \frac{63}{80}$

$$\text{పునరుటసాధు} = \boxed{8, 16, 40, 80} = 80$$

$$\checkmark \boxed{\frac{10}{80}}, \frac{65}{80}, \frac{62}{80}, \frac{63}{80}$$

(65) లంగ్జీ =  $x$   
 ప్రాథమిక సంఖ్య =  $(2x)$   $\rightarrow$  చిత్రి 12, 18, 21, 30 ను క్రమాలలో  
 $2x$  ప్రాథమిక 12, 18, 21, 30 లనేనా

$$\begin{array}{c|cccc} 2 & 12, 18, 21, 30 \\ \hline 3 & 6 & 9 & 21 & 15 \\ \hline 2 & 3 & 7 & 5 & \\ \hline & & & & \end{array} = \text{LCM} = 1260$$

$$2x = 1260$$

$$x = 630$$

(66) భూమాల టెస్టాసు =  $\frac{\text{పునరుటసాధు}}{\text{పునరుటసాధు}}$   
 $= \frac{\text{LCM}(6, 5, 10)}{\text{HCF}(7, 14, 21)} = \frac{30}{7}$

(67)  $\begin{array}{c|ccc} 2 & 12, 15, 18 \\ \hline 3 & 6 & 15 & 9 \\ \hline 2 & 5 & 3 & \\ \hline & & & \end{array}$  LCM = 180

$$\text{మొత్తమాత్రము} = 10,000$$

$$180) 10,000 (55$$

$\overbrace{400}^{1000}$

$\overbrace{900}^{900}$

$\overbrace{100}^{100}$

$\overbrace{100}^{100}$  ను క్రిందిల్లు

$$\begin{array}{r} 10000 \\ - 80 \\ \hline 10080 \end{array}$$

(68)

$$\begin{array}{r} 5 | 15, 25, 40, 75 \\ 3 | 3 5 8 15 \\ 5 | 1 5 8 5 \\ \hline 1 1 8 1 \end{array}$$

$$LCM = 600$$

$$4^{\text{வகு} \text{எல்லா} \text{முழு} \text{எண்ணா}} = 9999$$

$$\begin{array}{r} 600) 9999 (16 \\ \quad \quad \quad 600 \\ \hline \quad \quad \quad 3999 \\ \quad \quad \quad 3600 \\ \hline \quad \quad \quad 399 \end{array} \rightarrow \text{மீண்டும்}$$

$$\begin{array}{r} 9999 \\ - 399 \\ \hline 9600 \end{array}$$

$$\begin{array}{r} 2 | 5, 6, 4, 3 \\ 3 | 5, 3, 2, 3 \\ \hline 5 1 2 1 \end{array}$$

$$LCM = 60$$

$$\begin{array}{r} 60) 2497 (41 \\ \quad \quad \quad 240 \\ \hline \quad \quad \quad 97 \\ \quad \quad \quad 60 \\ \hline \quad \quad \quad 37 \end{array} \rightarrow \text{மீண்டும்}$$

$$\begin{array}{r} 4 | 16, 20, 24 \\ \quad \quad \quad 4, 5, 6 \\ \hline \quad \quad \quad 2 \ 5 \ 3 \end{array}$$

$$LCM = 240$$

$$LCM = 240$$

240 தோற்றுவதின் முழு எண்ணா?

(A)  $1600 \div 240 \times$

(B)  $3600 \div 240 \checkmark$

$$\begin{array}{r} 71 \quad 2 | 12, 16, 18, 21, 28 \\ \quad \quad \quad 2 | 6, 8, 9, 21, 14 \\ \quad \quad \quad 3 | 3 4 9 21 7 \\ \quad \quad \quad 7 | 1 4 3 7 7 \\ \hline \quad \quad \quad 1 4 3 1 1 \end{array}$$

$$\begin{array}{r} LCM = 1008 \\ + 7 \\ \hline 1015 \end{array}$$

$$\begin{array}{r} 72 \quad 2 | 24, 32, 36, 54 \\ \quad \quad \quad 2 | 12, 16, 18, 27 \\ \quad \quad \quad 2 | 6 8 9 27 \\ \quad \quad \quad 3 | 3, 4, 9, 27 \\ \hline \quad \quad \quad 1 4 3 9 \\ \quad \quad \quad 1 4 1 3 \end{array}$$

$$= 27 \times 32$$

$$= 864$$

$$\text{தொகை} = \frac{864}{5} = \frac{859}{5}$$

$$\begin{array}{r} 73 \quad 12, 15, 20, 54 \\ 2 | 6, 15, 10, 27 \\ 3 | 3 15, 5, 27 \\ 5 | 1 5 5 9 \\ \hline 1 1 1 9 \\ = 540 \end{array}$$

$$= 540 \times k + 8$$

$$(k = 1, 2, 3, \dots)$$

$$K = 1 \text{ உடன்டு}$$

$$N = 540(1) + 8 = 548$$

$$\begin{array}{r} 2 | 12, 15, 20, 54 \\ 2 | 6, 15, 10, 27 \\ 3 | 3 15, 5, 27 \\ 5 | 1 5 5 9 \\ \hline 1 1 1 9 \\ = 540 \end{array}$$

$$\begin{array}{r} 74 \quad 364) 9999 (27 \\ \quad \quad \quad 728 \\ \hline \quad \quad \quad 2719 \\ \quad \quad \quad 2548 \\ \hline \quad \quad \quad 171 \end{array}$$

$$\text{எண்} = 4x7 \times 13$$

$$= 364$$

$$\begin{array}{r}
 9999 \\
 - 171 \\
 \hline
 9828 \rightarrow \text{ఈ 364 తో రష్టింగ్ గా} \\
 - 30 \rightarrow +3 \quad \text{ఫోనుచుటుంది.} \\
 \hline
 9831
 \end{array}$$

4	48, 60, 72, 108, 140
2	12, 15, 18, 27, 35
3	6 15 9 27 35
3	2, 5, 3, 9, 35
5	2, 5, 1, 3, 35
	2, 1, 1, 3, 7

$$\Rightarrow 72 \times 21 \times 10 = \\
 = 15120$$



(75)  $\text{కొత్త సంఖ్య} = \text{LCM}(4, 6, 10, 15) \times K + 2$

$$= 60K + 2 \quad [K = 1, 2, 3, \dots]$$

$\rightarrow K = 1$  అవుతి

$$N = 62, \text{అంటే } 6+2=8$$

$\rightarrow K = 2$  అవుతి

$$N = 122, \text{అంటే } 1+2+2=5$$

(78)

$$\begin{array}{ccc}
 18 & 21 & 24 - \text{ఫోను} \\
 \| & \| & \| - \text{తీకు} \\
 7 & 10 & 13
 \end{array}$$

కొత్త సంఖ్య =  $\text{LCM}(18, 21, 24 \times K) - 11$

→ 23 సంఖ్యలు

$$N = 504K - 11 \quad [K = 1, 2, 3, \dots]$$

$$K = 1, N = 504 - 11 = 493 \rightarrow 23 \text{ సంఖ్యలు?} \times$$

18, 21, 24 కొత్త సంఖ్య = 504

$$\begin{aligned}
 K = 6, N = 504 \times 6 - 11 \\
 = 3024 - 11
 \end{aligned}$$

3013 → ఈ 23 సంఖ్యలు కదా  
చక్కచేస్తావా.

(79)

$$\begin{array}{r}
 5, 6, 7, 8 \\
 \hline
 5 3, 7 8 \Rightarrow 840
 \end{array}$$

కొత్త సంఖ్య =  $\text{LCM}(5, 6, 7, 8) \times K + 3$

$$N = 840 \times K + 3$$

$K = 2$  అవుతి,

$$N = 1680 + 3 = 1683 \checkmark$$

ప్రశ్నలు, కౌడింగ్ లో

$$\begin{array}{r}
 48, 60, 72, 108, 140 \\
 \hline
 12, 15, 18, 27, 35 \\
 \hline
 6 15 9 27 35 \\
 \hline
 2, 5, 3, 9, 35 \\
 \hline
 2, 5, 1, 3, 35 \\
 \hline
 2, 1, 1, 3, 7
 \end{array}$$

(76)  $\text{కొత్త సంఖ్య} = \text{LCM}(6, 9, 15, 18) \times K + 4$

$$N = 90K + 4 \quad [K = 1, 2, 3, \dots]$$

కొత్త సంఖ్య = 6, 9, 15, 18 → 90

$K = 1, N = 94, ?$  ఫోనుచుటుంది?

$K = 2, N = 184 \quad \| ? \times$

$K = 3, N = 274 \quad \| ? \times$

$\checkmark K = 4, N = 364 \quad \| ? \checkmark$

(77)  $\begin{array}{c} 48 \\ 10 \\ \hline 38 \end{array} \quad \begin{array}{c} 60 \\ 10 \\ \hline 50 \end{array} \quad \begin{array}{c} 72 \\ 10 \\ \hline 62 \end{array} \quad \begin{array}{c} 108 \\ 10 \\ \hline 98 \end{array} \quad \begin{array}{c} 140 \\ 10 \\ \hline 30 \end{array}$  — ఫోను

కొత్త సంఖ్య =  $\text{LCM}(48, 60, 72, 108, 140) - 10$

$$= 15120 - 10$$

$$= 15110$$

$$\begin{array}{r} 80 \\ 2 \boxed{16, 18, 20, 25} \\ 2 \boxed{8, 9, 10, 25} \end{array}$$

$$LCM = 3600$$

7 సెకండ్లు

$$\text{ఎవర్ణన అభ్యు} = LCM(16, 18, 20, 25) \times k + 4$$

$$N = 3600 \times k + 4$$

$$k=5, N = 3600 \times 5 + 4$$

$$N = 18000 + 4$$

$$N = 18004 \rightarrow 7 \text{ సెకండ్లు మార్గం } \\ \text{ఇట్లు చేయాలి.}$$

(81)

$$\begin{array}{r} 2 \boxed{2, 4, 6, 8, 10, 12} \\ 2 \boxed{1, 2, 3, 4, 5, 6} \\ 3 \boxed{1, 1, 3, 2, 5, 3} \\ 1, 1, 1, 2, 5, 1 \\ = 120 \text{ sec} \\ = 2 \text{ min} \end{array}$$

(అత్తి 2 min@) gap's కొసారి వ్యాపారం.

$$= \frac{30}{2} = 15 \text{ Gap's}$$

16 times వైట్రోగ్ వ్యాపారం.

(82)

30 పా॥, 1 గంచు,  $1\frac{1}{2}$  గంచు, 1 గంచి 45 పా॥

$$\begin{array}{r} 15 \boxed{30, 60, 90, 105} \\ 2 \boxed{2, 4, 6, 7} \\ 1, 2, 3, 7 \end{array}$$

$$= 15 \times 4 \times 21 \text{ p॥}$$

$$= \frac{15 \times 4 \times 21}{60} \text{ రో॥} \Rightarrow 21 \text{ రో॥}$$

$$= 12 \text{ pm} + 21 \text{ hrs} \Rightarrow 9. \text{ A.M.}$$

(83)

ఒయిష్ట్రోస్-బోట్ రెవాస్ట్ ఫ్రమయం (చెంబర్ ప్రాంతం)

$$= LCM(252, 308, 198)$$

$$= \frac{2772}{60}$$

$$= 46 \text{ min } 12 \text{ sec.}$$

$$2 \boxed{252, 308, 198}$$

$$2 \boxed{126, 154, 99}$$

$$7 \boxed{63, 77, 99}$$

$$11 \boxed{9, 11, 99}$$

$$9 \boxed{9, 1, 9}$$

$$1 \quad 1 \quad 1$$

$$= 28 \times 99$$

$$= 2772 \text{ sec}$$



# DECIMAL-FRACTIONS

$$\textcircled{1} \quad 101 \frac{27}{100000} = 101 + \frac{27}{100000}$$

$$= 101 + 0.00027$$

$$= 101.00027$$

$$\textcircled{2} \quad 0.36 = \frac{36}{100} = \frac{9}{25} \text{ అవస్థలమెత్తా } \\ = 9+25 = 34$$

$$\textcircled{3} \quad \frac{13550}{1\text{ నుండి}} = \frac{1\text{ sec}}{60 \times 60 \text{ sec}} = 0.000277$$

$$\textcircled{4} \quad 47.2506 = 4A + \frac{7}{B} + 2C + \frac{5}{D} + 6E$$

$$\begin{array}{l|l|l} 40 = 4A & A = \frac{X}{B} & X = 2C \\ A = 10 & B = 1 & C = 0.1 \end{array}$$

$$0.05 = \frac{5}{D}$$

$$\frac{1}{D} = 0.01$$

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

$$D = 100$$



ఘనము

$$\frac{2}{3}, \frac{3}{5}, \frac{7}{9}, \frac{9}{11}, \frac{8}{9}$$

66.66%, 60%, 77.77%, 81.81%, 88.88%.

$$\text{ఘనము } \frac{3}{5}, \frac{2}{3}, \frac{7}{9}, \frac{9}{11}, \frac{8}{9}.$$

$$\textcircled{7} \quad \frac{5}{9}, \frac{7}{11}, \frac{8}{15}, \frac{11}{17}$$

$$5\left(\frac{1}{9}\right), 7\left(\frac{1}{11}\right), 8\left(\frac{1}{15}\right), \frac{11}{17}$$

= 5(11.11%), 7(9.09%), 8(6.66%),  $\frac{11}{17} \times 100$

= 55.55%, 63.63%, 53.28%, 64%.

$$\text{ఘనము } = \frac{11}{17}, \frac{7}{11}, \frac{5}{11}, \frac{8}{15}$$

$$\textcircled{8} \quad \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}$$

66.66%, 75%, 80%, 83.33%.

వర్షా 83.33%

వప్ప 66.66%

$$16.66\% = \frac{1}{6}$$

(OR) →

$$= \frac{5}{6} - \frac{2}{3}$$

$$= \frac{5-4}{6}$$

$$= \frac{1}{6}$$

\textcircled{9}

$$= \frac{11}{14}, \frac{16}{19}, \frac{19}{21}$$

= 0.7, 0.8, 0.9

$$\text{ఘనము } = \frac{11}{14}, \frac{16}{19}, \frac{19}{21}$$

\textcircled{10}

$$\frac{13}{16}, \frac{15}{19}, \frac{17}{21}, \frac{7}{8}$$

0.8, 0.7, 0.8, 0.8

$$\text{ఘనము } = \frac{15}{19}$$

\textcircled{5}

$$\frac{1}{3}, \frac{2}{5}, \frac{4}{7}, \frac{3}{5}, \frac{5}{6}, \frac{6}{7}$$

33.33%, 40%, 57.12%, 60%, 83.33%.

85.0%.

$$\text{II) } \frac{3}{4} = 75\%, \quad \frac{5}{6} = 83.33\%$$

(16) 1. (1)

$$\textcircled{A} \frac{1}{2} = 50\% \quad \textcircled{B} \frac{2}{3} = 66.66\%$$

(17) 34.95

$$\checkmark \textcircled{C} \frac{4}{5} = 80\% \quad \textcircled{D} \frac{9}{10} = 90\%.$$

$$\begin{array}{r} 240.016 \\ 23.98 \\ \hline 298.946 \end{array}$$

$$12) \frac{1}{3} = 33.\overline{3}\%, \quad \frac{7}{8} = 7\left(\frac{1}{8}\right) = 7(12.5\%) \\ = 87.5\%$$

(18) 617

$$\textcircled{A} \quad \frac{1}{4} = 25\% \quad \textcircled{B} \quad \frac{23}{24} \\ = 23(4.1666\%) \\ = 92\%$$

$$\begin{array}{r} \underline{6.0017} \\ \underline{-629.6357} \end{array}$$

$$\textcircled{C} \quad \frac{11}{12} = 11(8.33) \quad \checkmark \quad \textcircled{D} \quad \frac{17}{24} \\ = 88\% \qquad \qquad \qquad = 17(4.16) \\ = 68\%.$$

$$\begin{array}{r} 48.950 \\ - 32.006 \\ \hline 16.944 \end{array}$$

$$\textcircled{13} = \frac{7}{3} \times 100, \quad \frac{4}{5} \\ = 53.8\%, \quad 80\%$$

$$\begin{aligned}
 28 &= 518,000,000 \\
 &= 518 \times 10^6 \\
 &= \frac{518 \times 10^6 \times 100}{100} \\
 &= 5.18 \times 10^8
 \end{aligned}$$

$$\textcircled{A} = 50\% \quad \textcircled{B} 66.66\%$$

⑬ 66.66%

$$\textcircled{C} \quad 75\% \quad \textcircled{D} \quad 5\left(\frac{1}{7}\right) = 5(14.28\%) \\ = 71.40\%$$

$$\begin{array}{r}
 \textcircled{37} \\
 95.75 \times 0.02554 \\
 \hline
 \begin{array}{r}
 97.75 \\
 - 5 \\
 \hline
 4
 \end{array}
 \times
 \begin{array}{r}
 0.01277 \\
 0.02554 \\
 \hline
 21
 \end{array}
 \end{array}$$

$$\textcircled{14} \quad \frac{-7}{10}, \quad \frac{-5}{8}, \quad \frac{-2}{3}$$

$-70\%, \quad -62.5\%, \quad -66.66\%$

$\Rightarrow$  ప్రాంగణ తప్పక '6' digits లోనా.

$$-\frac{70}{10}, -\frac{2}{3}, -\frac{5}{8}$$

$$0.00625 \text{ of } \frac{2^3}{5}$$

$$\begin{array}{r}
 15) \quad 337.62 \\
 \underline{-} \quad 8.59 \quad 1 \\
 \hline
 34.4 \\
 \hline
 380.611
 \end{array}$$

$$= \frac{\frac{125}{625}}{100000} \times \frac{23}{800}$$

$$2001 + 10 \text{ yrs} = 2011$$

(39)

$$\begin{aligned} &= 0.333 \times 0.25 \times 0.499 \times 0.125 \times 24 \\ &= \frac{1}{3} \times \frac{1}{4} \times 0.499 \times \frac{125}{1000} \times 24 \\ &= 0.5 \times \frac{1}{4} \\ &= \frac{1}{2} \times \frac{1}{4} \\ &= \frac{1}{8} \end{aligned}$$

(51)  $0.\overline{2} = \frac{2}{9} \rightarrow ①$

$$10x = 2.22\overline{22}$$

$$(→) \underline{x = 0.22\overline{22}}$$

$$9x = 2$$

$$x = \frac{2}{9} \rightarrow ①$$

$$100x = 23.23\overline{23}$$

$$(→) \underline{x = 0.2323\overline{23}}$$

$$99x = 23$$

$$x = \frac{23}{99}$$

(40) - ①      - ②      - ③

17) 368 (21.6)	62) 170 (2)	83) 875 (10)
<u>34</u>	<u>12</u>	<u>830</u>
28	46	<u>45</u>
17		
110		
102		

వర్ణసూచి = 1, 3, 2

(49) 1 వీటిను  $\rightarrow$  8 వీటిలు

37.5 వీటిను  $\rightarrow$  ?

$$\begin{aligned} &= \frac{37.5 \times 8}{1} \\ &= 300 \text{ వీటిలు} \end{aligned}$$



(50)

	x	y
2001	4.20	6.30
	420 paise	630 paise
	40 $\frac{2}{5}$ ↑	15 $\frac{3}{5}$ ↑

గాలి తర్వాత....

$$(420 + 40x) - (630 + 15x) = 40\frac{2}{5}$$

$$420 - 630 + 40x - 15x = 40$$

$$-210 + 25x = 40$$

$$25x = 250$$

$$x = 10$$

(52)  $0.\overline{125} = \frac{125}{999}$

(53)  $0.\overline{47} = \frac{47}{99}$

(54)  $0.\overline{36} = \frac{36}{99} = \frac{4}{11}$

(55)

$$\begin{array}{l|l|l|l} = 0.2 & = 1 \div 0.2 & 0.2 & 0.02 \\ = 0.2 & = \frac{1}{0.2} & = \frac{2}{9} & \\ & = \frac{1}{\frac{2}{10}} & = 0.8 & \\ & = 5 & & \end{array} \quad \begin{array}{l} \\ \\ \\ \end{array} \quad \begin{array}{l} = 0.04 \\ \end{array}$$

smallest = 0.04

(56)  $6.\overline{46} = 6 + 0.\overline{46}$

$$= 6 + \frac{46}{99}$$

$$= \frac{594 + 46}{99}$$

$$= \frac{640}{99}$$

(57)

$$0.\overline{57} = 0.5 + 0.\overline{07}$$

$$= 0.5 + \frac{7}{99}$$

$$x = 0.57777$$

$$100x = 57.\overline{47777} \dots$$

$$\begin{array}{r} (-) \\ 10x = 5.\overline{77777} \end{array}$$

$$90x = 52$$

$$x = \frac{52}{90} = \frac{26}{45}$$

(58)

$$x = 0.84181$$

$$100000x = 84181.8181\dots$$

$$\begin{array}{r} (-) \\ 1000x = 841.8181\dots \end{array}$$

$$99000x = 8334.0$$

$$x = \frac{8334}{9900} = \frac{463}{550}$$

$$x = \frac{463}{550} \quad \text{Ans} = 87.$$

(59)

$$= 4.\overline{12}$$

$$= 4 + 0.\overline{12}$$

$$x = 0.\overline{12} = 0.1222\dots$$

$$10x = 12.222\dots$$

$$\begin{array}{r} (-) \\ 10x = 1.222\dots \end{array}$$

$$90x = 11$$

$$x = \frac{11}{90}$$

$$\Rightarrow 4 + \frac{11}{90}$$

$$= 4\frac{11}{90}$$

$$\begin{array}{r} (60) \\ = 2 \cdot \overline{136} \\ = 2 + 0.\overline{136} \end{array}$$

$$x = 0.\overline{136}$$

$$\begin{array}{r} (-) \\ 1000x = 136.3636\dots \end{array}$$

$$\begin{array}{r} (-) \\ 10x = 1.3636\dots \end{array}$$

$$990x = 135$$

$$x = \frac{135}{990} \quad (15 \times 9) \quad (15 \times 6)$$

$$\frac{66}{22}$$

$$= 2 + \frac{3}{22}$$

$$= 2\frac{3}{22}$$



(61)

$$= 0.\overline{2} + 0.\overline{3} + 0.\overline{4} + 0.\overline{9} + 0.\overline{39}$$

$$= \frac{2}{9} + \frac{3}{9} + \frac{4}{9} + \frac{9}{9} + \frac{39}{99}$$

$$= \frac{2}{9} + \frac{39}{99} = 2\frac{13}{33}$$

(62)

$$\begin{array}{r} 3.\overline{87} \\ - 2.\overline{59} \\ \hline 1.\overline{28} \end{array}$$

(63)

$$= 3.\overline{36} - 2.\overline{05} + 1.\overline{33}$$

$$= 2.\overline{64}$$

(64)

$$= 0.0\overline{9} \times 7.\overline{3}$$

$$= \frac{9}{99} \times 7\frac{3}{9}$$

$$= \frac{1}{11} \times \frac{66}{9} = \frac{2}{3}$$

$$= \frac{66}{99} = \frac{2}{3} = 0.\overline{6}$$

(65)

$$x = 0.34\overline{67}$$

$$= \frac{3467 - 34}{9900} + \frac{1333 - 13}{9900}$$

$$= \frac{3433}{9900} + \frac{1320}{9900}$$

$$= \frac{4753}{9900}$$

$$= \frac{4801 - 48}{9900} = 0.4801$$

$$\textcircled{66} \quad = 8.\overline{31} + 0.\overline{6} + 0.00\overline{2}$$

$$= 8 + \frac{31-3}{90} + \frac{6}{9} + \frac{2}{900}$$

$$= 8 + \frac{28}{90} + \frac{6}{9} + \frac{2}{900}$$

$$= 8 + \frac{280+600+2}{900} = 8 + \frac{882}{900}$$

$$= 8 + \frac{979-77}{900}$$

$$= 8 + 0.979$$

$$= 8.979$$

$$\textcircled{67} \quad = \overline{2.75} + \overline{3.78}$$

$$= -2 + 0.75 - 3 + 0.78$$

$$= -5 + 1.53$$

$$= -4 + 0.53$$

$$= \overline{4.53}$$

$$\textcircled{70} \quad 213 \times 16 = 3408$$

$$21.3 \times 1.6 = 34.08$$

$$\textcircled{71} \quad \frac{1}{6.198} = 0.16134 \quad \left| \begin{array}{l} = \frac{1}{0.0006198} \times \frac{10000}{10000} \\ = \frac{1}{6.198} \end{array} \right.$$

$$= 10000 \left( \frac{1}{6.198} \right)$$

$$= 10000 (0.16134)$$

$$= 1613.4$$



$$\textcircled{72} \quad \frac{52416}{312} = 168$$

$$\frac{52.146}{0.0168}$$

$$= \frac{52146/1000}{168/10000} = \left( \frac{52146}{168} \right) \times 10$$

$$= 3120$$

$$\textcircled{73} \quad \frac{5.376}{1.68}$$

$$= \frac{5376/1000}{168/100}$$

$$= \left( \frac{5376}{168} \right) \times \frac{1}{100}$$

$$= 32 \times \frac{1}{100}$$

$$= 0.32$$

\textcircled{74} Option - A

\textcircled{75} Option - D

$$\textcircled{76} \quad \frac{a-b}{a+b} \div \frac{10a-10b}{\frac{a}{10} + \frac{b}{10}}$$

$$= \frac{a-b}{a+b} \times \frac{\frac{a}{10} + \frac{b}{10}}{10a-10b}$$

$$= \frac{a+b}{a+b} \times \frac{\frac{1}{10}(a+b)}{\frac{1}{10}(a+b)}$$

$$= \frac{1}{100} = 10^{-2}$$

77

$$\begin{aligned} &= (0.11)^3 + (0.22)^3 + \dots + (0.99)^3 \\ &= (0.11 \times 1)^3 + (0.11 \times 2)^3 + \dots + (0.11 \times 9)^3 \\ &= (0.11)^3 (1^3 + 2^3 + \dots + 9^3) \\ &= 0.001331 (2025) \\ &= 2.695275 \end{aligned}$$

### - BODMAS -

Bracket, Of, Division, multiplication,  
Addition, Subtraction

78

$$8.7 - [7.6 - \{6.5 - (5.4 - \overline{4.3-2})\}]$$

79

$$\frac{1}{4} + \frac{1}{4 \times 5} + \frac{1}{4 \times 5 \times 6}$$

$$= \frac{1}{4} \left( 1 + \frac{1}{5} + \frac{1}{30} \right)$$

$$= \frac{1}{4} (1 + 0.20 + 0.0333\dots)$$

$$= \frac{1}{4} (1.233\dots)$$

$$= 0.3083$$



80

$$= 1 + \frac{1}{2^1} + \frac{1}{2^3} + \frac{1}{2^6} + \frac{1}{2^{10}}$$

$$= \frac{2^{10} + 2^9 + 2^7 + 2^4 + 1}{2^{10}}$$

$$= \frac{1024 + 512 + 128 + 16 + 1}{1024} = \frac{1681}{1024}$$

$$= 1.6416$$

81

$$= \frac{1}{5 \times 6} + \frac{1}{6 \times 7} + \frac{1}{7 \times 8} + \dots + \frac{1}{24 \times 25}$$

$$= \left( \frac{1}{5} - \frac{1}{6} \right) + \left( \frac{1}{6} - \frac{1}{7} \right) + \left( \frac{1}{7} - \frac{1}{8} \right) + \dots + \left( \frac{1}{24} - \frac{1}{25} \right)$$

$$= \frac{5-1}{25} = \frac{4}{25} = 0.16$$

82

$$1.5x = 0.04y$$

$$\frac{15}{10}x = \frac{4}{100}y$$

$$\frac{x}{y} = \frac{2}{75} \quad x=2 \quad y=75$$

$$\frac{y-x}{y+x} = \frac{75-2}{75+2} = \frac{73}{77}$$

83

$$= 35.7 - \left( 3 + \frac{3}{10} \right) - \left( 2 + \frac{2}{5} \right)$$

$$= 35.7 - 3.3 - 2.4$$

$$= 35.7 - 5.7$$

$$= 30$$

84

$$= \frac{\frac{1}{6} \times \frac{5}{6} \times \frac{1}{3}}{\frac{2}{9} \times \frac{2}{3} \times \frac{1}{8}} = \frac{5}{2} = 2.5$$

85

$$= \frac{\frac{4}{36} \times \frac{4}{48} \times \frac{5}{25} \times \frac{1}{10}}{\frac{1}{12} \times \frac{1}{9} \times \frac{1}{5} \times \frac{1}{10^5}}$$

$$= \frac{80}{10^1} \Rightarrow \frac{80}{10} \Rightarrow 80 \times 10 = 800$$

86

$$\begin{aligned} &= \frac{\frac{29^2}{203} \times \frac{4}{292} \times \frac{1}{10^6}}{\frac{73}{5} \times \frac{45}{14} \times \frac{1}{7} \times \frac{1}{10^6}} \\ &= \frac{4}{5} \\ &= 0.8 \end{aligned}$$

(87) Option - D c

$$= \frac{3 \times 4126 \times 3}{63 \times 2805} \times 10^6$$

$$= \frac{600}{2800} = \frac{1}{4} = 0.2$$

(88)

$$= \frac{6}{489 \times 0.04 \times 2 \times 10^4}$$

$$= \frac{6}{0.08 \times 98 \times 100 \times 10^4}$$

$$= \frac{6}{100} \times 10^{-1}$$

$$= \frac{6}{1000} \Rightarrow 0.006$$

(89)

$$= \frac{4}{240 \times 38 \times 69} \times \frac{1}{10^5}$$

$$= \frac{12}{46 \times 38 \times 755} \times \frac{1}{10^5}$$

$$= \frac{12}{25} \times \frac{4}{4} = \frac{48}{100}$$

$$= 0.48$$

(90)

$$= ((0.2)^2 + 0.01) ((0.1)^2 + 0.02)^{-1}$$

$$= \frac{0.04 + 0.01}{0.01 + 0.02} = \frac{0.05}{0.03} = \frac{5}{3}$$

(91)

$$= \frac{5 \times 1.6 - 2 \times 1.4}{13}$$

$$= \frac{5 \times 16 - 2 \times 14}{13} = \frac{80 - 28}{13} = \frac{52}{13} = 4$$

(92)

$$= 4.7 (13.26 + 9.43 + 77.31)$$

$$= 4.7 (100)$$

$$= 470$$

(93)

$$= 0.2 \times 0.2 + 0.2 \times 0.2$$

$$= 0.044$$

$$= \frac{0.04 + 0.004}{0.044} = \frac{0.044}{0.044} = 1.$$

(94)

$$= \frac{8}{6} (5.3 + 4.7)$$

$$= 2 \left( \frac{10}{1} \right)$$

$$= 20$$

(95)

$$= \frac{0.896 (0.763 + 0.237)}{0.7 (0.064 + 0.936)}$$

$$= \frac{0.896}{0.7} \left( \frac{1}{1} \right)$$

$$= \frac{896 \times 10^{-3}}{7 \times 10^{-1}} = 128 \times 10^{-2} = 1.28$$

(96)

$$a^2 - b^2 = (a+b)(a-b)$$

$$(68.237)^2 - (31.763)^2 = (68.237 + 31.763)(68.237 - 31.763)$$

$$= 100 (364.474)$$

$$= 36474$$

(97)

$$\frac{2.39^2 - 1.61^2}{2.39 - 1.61} = \frac{a^2 - b^2}{a - b} = \frac{(a+b)(a-b)}{(a-b)} = a+b$$

$$= 2.39 + 1.61$$

$$= 4$$

(98)

$$= \frac{2.644^2 - 2.356^2}{0.288}$$

$$= \frac{2.644^2 - 2.356^2}{2.644 - 2.356}$$

$$= \frac{a^2 - b^2}{a-b} = \frac{(a+b)(a-b)}{(a-b)} = a+b$$

$$= 2.64 + 2.356$$

$$= 5$$

$$\textcircled{99}$$
  

$$\frac{a^2 - b^2}{a-b} = a+b$$

$$\frac{36.54^2 - 3.46^2}{36.54 - 3.46} = 36.54 + 3.46$$

$$\Rightarrow 33.08$$

$$\textcircled{100}$$
  

$$= \frac{67.54^2 - 32.458^2}{75.458 - 40.374} = 1$$

$$= \frac{67.54^2 - 32.458^2}{67.542 - 32.458} =$$

$$= \frac{a^2 - b^2}{a-b}$$

$$= a+b \Rightarrow 67.542 + 32.458 = 100$$

$$\textcircled{101}$$
  

$$\frac{1.49 \times 14.9 - 0.51 \times 5.1}{14.9 - 5.1}$$

$$= 1.49 \times 14.9 - 0.51 \times 5.1$$

$$= \frac{1.49 \times 1.49 - 0.51 \times 0.51}{1.49 - 0.51}$$

$$= \frac{a^2 - b^2}{a-b} = a+b = 1.49 + 0.51 = 2.$$

$$\textcircled{102}$$
  

$$= \frac{4.2 \times 4.2 - 1.9 \times 1.9}{2.3 \times 6.1}$$

$$= \frac{4.2 \times 4.2 - 1.9 \times 1.9}{(4.2 - 1.9)(4.2 + 1.9)}$$

$$\textcircled{103}$$
  

$$= \frac{a^2 - b^2}{(a-b)(a+b)} = 1$$

$$= \frac{5.32(56+44)}{(7.66+2.34)(7.66-2.34)}$$

$$= \frac{5.32(100)}{(10)(5.32)} = 10$$

$$\textcircled{104}$$
  

$$= \frac{a^4 - b^4}{a^2 + b^2} = \frac{(a^2)^2 - (b^2)^2}{a^2 + b^2}$$

$$= \frac{(a^2 + b^2)(a^2 - b^2)}{a^2 + b^2}$$

$$= (a+b)(a-b)$$

$$= (0.6 + 0.5)(0.6 - 0.5)$$

$$= (1.1)(0.1)$$

$$= 0.11$$

$$\textcircled{105}$$
  

$$= 7.5 \times 7.5 + 37.5 + 2.5 \times 2.5$$

$$= (7.5)^2 + 2 \times 7.5 \times 2.5 + (2.5)^2$$

$$= a^2 + 2 \times a \times b + b^2$$

$$= (a+b)^2$$

$$= (7.5 + 2.5)^2 = (10)^2$$

$$= 100$$

$$\textcircled{106}$$
  

$$= \frac{0.2^2 + 0.02^2 - 2 \times 0.2 \times 0.02}{0.36}$$

$$= \frac{(0.2 - 0.02)^2}{0.36}$$

$$= \frac{0.18^2}{0.36} = 0.09$$

(107)

$$11.98^2 + 11.98 \times 2 + 0.02^2$$

$$a^2 + 2ab + b^2 = (a+b)^2$$

$$2 \times 11.98 \times 0.02$$

$$x = 2 \times 0.02$$

$$x = 0.04$$

(108)

$$= \frac{(a-b)^2 + (a+b)^2}{a^2 + b^2}$$

$$= 2 \left( \frac{a^2 + b^2}{a^2 + b^2} \right)$$

$$= 2$$

(109)

$$= \frac{(a+b)^2 - (a-b)^2}{ab}$$

$$= \frac{4ab}{ab} = 4$$

$$\boxed{a^3 + b^3 = (a+b)(a^2 - ab + b^2)}$$

$$\boxed{a^3 - b^3 = (a-b)(a^2 + ab + b^2)}$$

(110)

$$\frac{a^3 + b^3}{a^2 - ab + b^2} = a+b$$

$$= 0.051 + 0.041$$

$$= 0.092$$

(111)

$$\frac{a^2 - ab + b^2}{a^3 + b^3} = \frac{1}{a+b}$$

$$= \frac{1}{0.953 + 0.047}$$

$$= \frac{1}{1}$$

$$= 1$$

(112)

$$\frac{0.125 + 0.027}{0.5 \times 0.5 + 0.09 - 0.15} = \frac{(0.5)^3 + (0.3)^3}{(0.5)^2 + (0.3)^2 - (0.5)(0.3)} = \frac{a^3 + b^3}{a^2 - ab + b^2} = a+b = 0.5 + 0.3 = 0.8$$

(113)

$$\frac{(10.3)^3 + 1^3}{(10.3)^2 - (10.3)(1) + 1^2} = \frac{a^3 + b^3}{a^2 - ab + b^2} = a+b = 10.3 + 1 = 11.3$$

(114)

$$\frac{2^3 (3.75)^3 + 1^3}{(7.5)^2 - 7.5 + 1} = \frac{(7.5)^3 + 1^3}{(7.5)^2 - 7.5 \times 1 + 1^2} = \frac{a^3 + b^3}{a^2 - ab + b^2} = a+b = 7.5 + 1 = 8.5$$

(115)

$$= \frac{1 (0.1 \times 0.1 \times 0.1 + 0.02 \times 0.02 \times 0.02)}{8 (0.1 \times 0.1 \times 0.1 + 0.02 \times 0.02 \times 0.02)} = \frac{1}{8} \Rightarrow 0.125$$

(116)

$$\frac{a^3 - b^3}{a^2 + ab + b^2} = a-b = 8.94 - 3.56 = 5.38$$

(117)

$$\frac{0.96^3 - 0.1^3}{0.96^2 + 0.96 \times 1 + 1^2} = \frac{a^3 - b^3}{a^2 + ab + b^2}$$



$$= a - b$$

$$= 0.96 - 0.1$$

$$= 0.86$$

(118)

$$\frac{(2.3)^3 - (0.3)^3}{(2.3)^2 + (2.3) \times (0.3) + (0.3)^2}$$

$$= \frac{a^3 - b^3}{a^2 + ab + b^2} = a - b$$

$$= 2.3 - 0.3 \\ = 2$$

(119)

$$= \frac{(0.06)^2 + (0.47)^2 + (0.079)^2}{\frac{(0.06)^2}{10} + \left(\frac{0.47}{10}\right)^2 + \left(\frac{0.079}{10}\right)^2}$$
$$= \frac{1}{\frac{1}{10^2}} \\ = 100$$



Q (RRB - 2018)

$$\frac{0.98 \times 0.98 \times 0.98 + 0.02 \times 0.02 \times 0.02 + 3 \times 0.98 \times 0.02 - 1}{0.98 \times 0.98 + 2 \times 0.98 \times 0.02 + 0.02^2}$$

$$= \frac{(0.98)^3 + (0.02)^3 + 3(0.98)(0.02)(0.98+0.02) - 1}{11}$$

$$= \frac{(0.98+0.02)^3 - 1}{11}$$

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

$$= 0$$

# Simplifications

(124)

$$\frac{2}{4} \times \frac{4}{3} \times \frac{5}{3} \times \frac{3}{5} \times \frac{13}{7} \times \frac{1}{13} = \frac{1}{7}$$

(125)

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

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

(126)

$$= \frac{8}{2} \times \frac{4}{3} \times \frac{5}{4} \times \dots \times \frac{121}{120}$$

$$= \frac{121}{2} = 60.5$$

(127)

$$= \frac{5}{3} \times \frac{1}{8} \times \frac{1}{7} \times \dots \times \frac{1003}{1001}$$

$$= \frac{1003}{3}$$

(128)

$$= \frac{1}{2} + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \frac{1}{30} + \dots + \frac{1}{132}$$

$$= \frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \frac{1}{4 \times 5} + \dots + \frac{1}{11 \times 12}$$

$$= \left(1 - \frac{1}{2}\right) + \left(\frac{1}{2} - \frac{1}{3}\right) + \left(\frac{1}{3} - \frac{1}{4}\right) + \dots + \left(\frac{1}{11} - \frac{1}{12}\right)$$

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

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

(129)

$$30 \text{ కె}^3 6' \text{ సార్కుల్యిటో =}$$

$$\cancel{\frac{1}{2}} + \cancel{\frac{1}{3}} - \cancel{\frac{1}{4}} - \cancel{\frac{1}{2}} - \cancel{\frac{1}{3}} + \cancel{\frac{1}{4}} = 0$$

$$30 \text{ సార్కుల్యిటో = 0}$$

$$(31-35) 35 \text{ సార్కుల్యిటో =}$$

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

(130)

$$\begin{aligned} &= \frac{999^2 + 995}{999} \times 999 & a^2 - b^2 = (a+b)(a-b) \\ &= 998001 + 995 & a^2 = (a+b)(a-b) + b^2 \\ &= 998996 & 999^2 = (999+1)(999-1) + 1^2 \\ &&= 998001 \end{aligned}$$

(131)

$$\begin{aligned} &= 999 + \frac{1}{7} + 999 + \frac{2}{7} + 999 + \frac{3}{7} + 999 + \frac{4}{7} + \dots \\ &= 999 \times 6 + \frac{1+2+3+4+5+6}{7} \\ &= 5994 + \frac{21}{7} \\ &= 5997. \end{aligned}$$

(132)

$$\begin{aligned} &= 1 + \frac{1}{4 \times 3} + \frac{1}{4 \times 3^2} + \frac{1}{4 \times 3^3} \\ &= \frac{4 \times 3^3 + 3^2 + 3 + 1}{4 \times 3^3} \\ &= \frac{108 + 9 + 3 + 1}{108} = \frac{121}{108} \end{aligned}$$

(133)

$$\begin{aligned} &= \frac{1}{1 \times 2 \times 3} + \frac{1}{2 \times 3 \times 4} + \frac{1}{3 \times 4 \times 5} + \frac{1}{4 \times 5 \times 6} \\ &= \frac{4 \times 5 \times 6 + 5 \times 6 + 2 \times 6 + 2 \times 3}{1 \times 2 \times 3 \times 4 \times 5 \times 6} \end{aligned}$$

(134)

$$= \frac{120 + 30 + 12 + 6}{720} = \frac{\cancel{120}^7}{\cancel{720}^{120} \cancel{30}^{30}} = \frac{7}{30}$$

(135)

$$\begin{aligned} &= \frac{3}{1^2 - 2^2} + \frac{5}{2^2 - 3^2} + \frac{7}{3^2 - 4^2} + \dots + \frac{19}{9^2 - 10^2} \\ &= \left(\frac{1}{1^2} - \frac{1}{2^2}\right) + \left(\frac{1}{2^2} - \frac{1}{3^2}\right) + \left(\frac{1}{3^2} - \frac{1}{4^2}\right) + \dots + \left(\frac{1}{9^2} - \frac{1}{10^2}\right) \\ &= 1 - \frac{1}{100} \Rightarrow \frac{99}{100} \end{aligned}$$

(135) విశ్వాసయింది =  $\frac{\text{మొత్తంపాడు}}{\text{భేదం వారిపాడు}}$   
 $= \frac{42.5 \text{ cm}}{85 \text{ cm}} = \frac{5}{85} \text{ cm}$   
 $= 50 \text{ మిమీటు}$

(136) ఒక సంఖ్యలో ప్రత్యేకం =  $x 2$

$5 \text{ సంఖ్య} \quad \text{II} = x 2^5$

$\text{ప్రధానయింది} = 4,00,000 \times 2^5$   
 $= 1,28,00,000 \text{ లక్షులు}$   
 $= 1.28 \text{ crores.}$

(137) మొత్తం = వరుసలనట్టు \times ప్రతివరుసలకు ప్రత్యేకం  
~~10~~  $\frac{30 \times 16}{\text{మంది}} = \frac{24 \times x}{\text{మంది}}$   
~~2~~  $\frac{\cancel{30} \times \cancel{16}}{\text{మంది}} = \frac{\cancel{24} \times x}{\text{మంది}}$   
 $x = 20$

(138) ప్రతిసిద్ధాన్తం 24 మంది కింద్యులన్నియి. ఈంత మంది కొత్త విధానాలను చేయుటపుడు వల్ల మాడుకొత్త సిద్ధాన్తం ఉండగా. తల్లితం 16 సిద్ధాన్తం (కొత్తసిద్ధాన్తం) లచేసినఅవ్యాప్తి 16 సిద్ధాన్తం, ప్రతిసిద్ధాన్తి 21 మంది విధ్యులున్నియి. ఈంత చేయుటున్న ప్రాణులనట్టు?

సిద్ధాన్తంలనట్టు	సిద్ధాన్తం విధ్యులనట్టు	మొత్తం
అక్తు 13	24 మంది	$13 \times 24 = 312$
ఫ్రె 16	21 మంది	$16 \times 21 = 336$

$\text{కొత్తసిద్ధాన్తం పబ్లికులనట్టు} = 336 - 312 = 24$

(139)  $10 \text{ Am} - 1:27 \text{ pm} = 3 \text{ hrs. } 27 \text{ min}$   
 $= 180 + 27$   
 $= 207 \text{ min.}$

+ పీఠియాట్, రౌండ్ 3 periodsతోతో 5 min break  
 $= 3 \times 5 = 15 \text{ min}$

కొన్సిడెంట్ సిద్ధాన్తం =  $207 - 15 = 192 \text{ min.}$

$\text{1 period} = \frac{192}{4 \text{ periods}} = 48 \text{ min.}$

(140)

3 నంగీ	17 నంగీ	49 sec
1 నంగీ	54 నంగీ	50 sec
<hr/>		
1 నంగీ	22 నంగీ	59 sec

Second set =

మార్కింగ్

$$\begin{array}{c} 8 \times 3,8 \times 2 \\ \text{HYD. * 97 } \\ \text{SPOORTI STC } \\ \text{3600 + 1320 + 59} \\ \hline 4979 \end{array}$$

$$= 60 \times 60 + 22 \times 60 + 59$$

$$= 3600 + 1320 + 59$$

$$= 4979 + 1 = 384 \text{ times.}$$

(141)

1st day	2nd day	విధ్యులు (రూ)
20 సిద్ధాన్తం	15 సిద్ధాన్తం	5రూ ప్రతి 2824 రూ

Thought 1 :

$$\text{ప్రతి 2824 రూ } 5 \text{ రూ ప్రతి 60 రూ దాటి } 60/6 = 10 \text{ రూ}$$

$$\text{దాటి } 24 = 24 \text{ రూ ప్రతి 10 రూ.}$$

Thought - 2 :

$$60 \text{ రూ extra } 20 \text{ రూ}$$

$$60 - 20 = 40 \text{ రూ (Normal రూ)}$$

$$\text{ప్రతి } 5 \text{ రూ } 2824 \text{ రూ }$$

$$40 \text{ రూ } 1 \text{ రూ } = 16.82 \text{ రూ, } 17.82 \text{ రూ } 20' \text{ రూ}$$

$$17.82 \text{ రూ } = 40 + 20$$

$$= 60$$

17.82 రూ 60 సిద్ధాన్తం.

142 వెత్త 0 z  
 1000 x Rs      లీఫర్ (z-1000) y Rs

$$\begin{aligned} \text{వెత్త 0 ఖర్చు} &= 1000x + (z-1000)y \\ &= 1000x + yz - 1000y \\ &= 1000(x-y) + yz. \end{aligned}$$

143 1st 2nd 3rd 3-చెక్కునాటతే ఒక్కవర  
 దూరాలంబం 00.

26-చెక్కునాటతే 25  
 నమోదుదూరాలంబం.

$$\begin{aligned} \text{సుధా-పొట్టి మర్గారో} &= \frac{225}{25} \text{ m} \\ &= 9 \text{ meters} \end{aligned}$$

144 సోఫ్ట్ = x

<u>wrong</u>	<u>Correct</u>	<u>తెల్క</u>
--------------	----------------	--------------

$$52x - 25x = 324$$

$$\underline{27x = 324}$$

$$x = 12$$

145

$\begin{array}{r} 423 \\ \times 3 \\ \hline 141 \\ \quad 47 \\ \hline 423 = (3 \times 3) \times 47 \end{array}$	<u>Check Options</u> 9 గుణాలు ఉపాయాలు
---	--

(a) 9 ✓  
 (b) 9 ✗  
 (c) 9 ✗  
 (d) 1 ✗

146 ప్రాణశుద్ధి  

$$(x-500)$$
 

$$4(x-500) + 2x = 46000$$

$$6x = 48000$$

$$x = 8000$$

147 History English

$$x \quad 2 \frac{1}{2} \times 3 \frac{1}{3} = \frac{5}{2} x$$

$$H:E = (x : \frac{5}{2}x) \times 2$$

$$H:E = \frac{2}{\textcircled{5}} \therefore \textcircled{5}$$

$$\text{వెత్త 0} \quad 7 \xrightarrow{\times 20} 140$$

$$5 \xrightarrow{\times 20} ? = 100$$

148 Pineapple Watermelon

$$x \text{ సోఫ్ట్} \\ 7 \text{ Rs}$$

$$4 \text{ సోఫ్ట్} \\ 5 \text{ Rs}$$

$$7x + 5y = 38$$

$$y = \frac{38 - 7x}{5}$$



149

$$\text{చాలు} \quad \text{చాలు} \quad \text{వెత్త 0} \\ x \quad 5x = 6x$$

$$308 \text{ వాళ్ళ } 6 \text{ గుగ్గిలు } 2 \text{ లెంబ } = \textcircled{35}$$

150

F		C
---	--	---

$$212^\circ F \quad 32^\circ F \quad | \quad 100^\circ \quad 0^\circ$$

$$\frac{F - 32}{212 - 32} = \frac{C - 0}{100 - 0}$$

$$\frac{F - 32}{180} = \frac{C}{100}$$

$$\frac{F - 32}{9} = \frac{35}{5}$$

$$F - 32 = 63$$

$$F = 95^\circ F.$$

151

$$\frac{A}{B+C} = \frac{2x+125}{2x+125} \quad \left| \begin{array}{c} \frac{B}{C} = \frac{x+125}{x} \\ \downarrow \\ 125 \end{array} \right. \quad \left| \begin{array}{c} \frac{C}{D} = \frac{x}{x} \\ \downarrow \\ 1 \end{array} \right.$$

999 pages + 75 pages = 1074 pages.

$$A+B+C+D = 2x+125+x+125+x+x = 750 \\ = 5x = 500 \quad (\rightarrow) \\ x = 100$$

$$A \text{ अंक} = 2x+125 \\ = 2(100)+125 \\ = 325$$

152

$$S : R = 1 : 2$$

$$S : G = 1 : 5$$

$$S : R : G = 1 : 2 : 5$$

$$Gagan = \frac{5}{8} \times 1000 = 625$$

153

$$1 - 9 (\text{2 अंक नंबर}) = 9 \times 1 = 9 \text{ अंक}$$

$$10 - 99 (\text{2 अंक}) = 90 \times 2 \text{ अंक} = 180 \text{ अंक}$$

$$100 - 366 (\text{3 अंक}) = 267 (\text{नंबर}) \times 3 \text{ अंक} = 801$$

$$\rightarrow \boxed{\frac{\text{Last No} - \text{First No}}{\text{diff}} + 1} \quad \underline{\hspace{10em}} \quad \underline{\hspace{10em}} \quad \underline{\hspace{10em}}$$

154

$$1 - 9 (\text{2 अंक नंबर}) = 9 \times 1 = 9 \text{ अंक}$$

$$10 - 99 (\text{2 अंक}) = 90 (\text{नंबर}) \times 2 \text{ अंक} = 180$$

$$100 - 999 (\text{3 अंक}) = 900 (\text{नंबर}) \times 3 \text{ अंक} = 2700$$

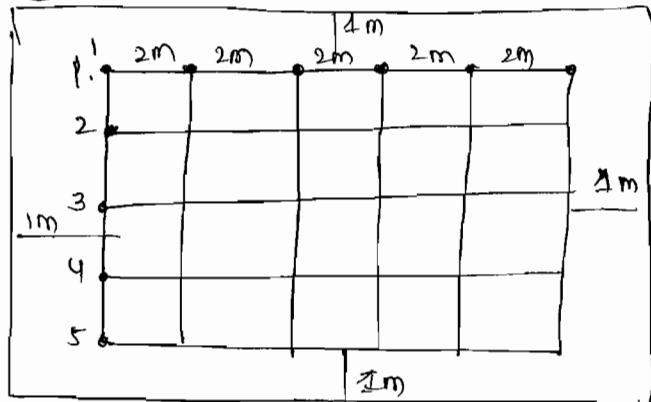
$$\underline{\hspace{10em}}$$

$$4 \text{ अंक नंबर} = 300$$

$$\Rightarrow 300 = \frac{300}{4} = 75 \text{ अंक}.$$

$$\frac{3189}{2889} \quad \frac{2889}{300}$$

155



12-చెట్లు 11 వరససమనచూపు

$$\text{పొడవు} = 11 \times 2 \text{ m} = 22 \text{ m}$$

$$\text{ఉపాధి పొడవు} = 22 + 2 \\ = 24 \text{ mtrs.}$$

158

(గొంతు)

$$\text{వింగోనెలియి త్రైను} = 1 \text{ Rs.}$$

$$\text{మూర్ఖునెలియి} = 2 \text{ Rs}$$

$$\text{వార్షికియి} = 11 \text{ Rs} + 2 \text{ Rs} = 13 \text{ Rs}$$

$$\text{మార్కెటు వంతు} = \frac{2}{13}$$

$$159 \quad \text{ముత్తు నీపు} = x \text{ గ.మ.}$$

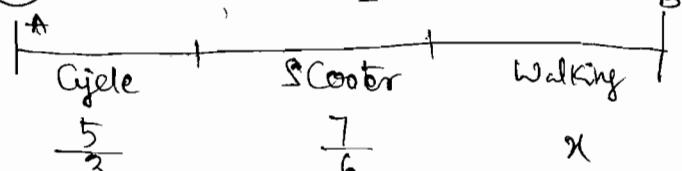
$$\frac{x}{3} = 80 \text{ లీ.}$$

$$x = 240 \text{ లీ.}$$

$$240 = 120 \text{ లీ.}$$

160

$$3.5 \text{ km} = \frac{7}{2}$$



$$\frac{5}{3} + \frac{7}{6} + x = \frac{7}{2}$$

$$x = \frac{7}{2} - \frac{5}{3} - \frac{7}{6}$$

$$x = \frac{21 - 10 - 7}{6} = \frac{4}{6} = \frac{2}{3} \text{ km}$$

$$\text{క్రానిస్టర్ వంతు} = \frac{2/3}{7/2} = \frac{4}{21} \text{ వంతు}$$

(161)  $\frac{4}{7}$  లో ఎన్నవంతు భిన్నం ఇన్నికి రెఫాలీ  
ఖలత 1  $\frac{1}{14}$  అవుటో?

$$\frac{4}{7} + \frac{4x}{7} (\text{అవుటుభిన్నం}) = 1 \frac{1}{14}$$

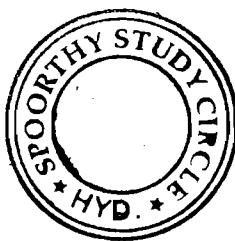
$$\frac{4}{7} + \frac{4x}{7} = \frac{15}{14}$$

$$\frac{4}{7}(1+x) = \frac{15}{14}$$

$$1+x = \frac{15}{8}$$

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

$$x = \frac{7}{8}$$



(162)  $\frac{2}{3}$  of  $\frac{1}{4}$  of Rs 25.20 అనేది  $1\frac{1}{2}$  of

36 లో ఎత్తత ఎన్నవంతు?

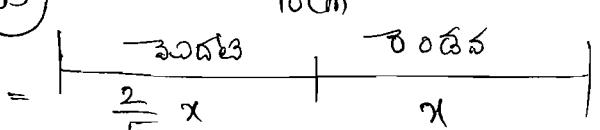
$$= \frac{\frac{2}{3} \times \frac{1}{4} \times 25.2}{}$$

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

$$= \frac{\frac{2}{3} \times \frac{1}{4} \times \frac{1}{3} \times \frac{25.2}{36}}{}$$

$$= \frac{7}{90}$$

70cm



$$= \left( \frac{2}{5}x : x \right) \times 5$$

$$= 2 : 5$$

$$20 : 50$$

7 → 70

2 → 10

5 → 50

(164)

$$\begin{array}{c} A \\ \frac{3}{16} \\ \hline B \\ \frac{1 \times 4}{4 \times 4} = \frac{4}{16} \\ \hline C \\ \frac{9}{16} \end{array}$$

మొత్తం 16 వాటాడు

$$A : B : C = 3 : 4 : 9$$

$$(A) 9 \xrightarrow{\times 9} 81$$

$$(B) 4 \xrightarrow{\times 9} 36$$

(165)

R	B	W	B	VIO	Yellow	Green
$\frac{1}{10}$	$\frac{1}{20}$	$\frac{1}{30}$	$\frac{1}{40}$	$\frac{1}{50}$	$\frac{1}{60}$	Remain.

$$\begin{aligned} \text{గంపచు} &= 1 - \frac{1}{10} \left( 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} \right) \\ &= 1 - \frac{1}{10} \left( \frac{60 + 30 + 20 + 15 + 12 + 10}{60} \right) \\ &= 1 - \frac{147}{600} \end{aligned}$$

$$\text{గంపచు} = \frac{453}{600} \quad \begin{matrix} \text{850 ప్రథమ} \\ \text{600 మొత్తం} \end{matrix}$$

గంపచు 453 → 12.08 m

$$\begin{aligned} \text{మొత్తం} 600 &\rightarrow ? = \frac{600 \times 12.08}{453} \\ &= 16 \text{ meters} \end{aligned}$$

(166)

$$\overline{\text{soops}} = x$$

wrong

$$\frac{3}{4}x - \frac{3}{14}x = 150$$

$$\frac{21x - 6x}{28} = 150$$

$$\frac{15x}{28} = 150$$

$$x = 280$$

Correct

167

ఫలించడం

Wrong

గుర్తించడం

Correct

$$\frac{8}{3}x - \frac{3}{8}x = 55$$

$$\frac{64x - 9x}{24} = 55$$

$$\frac{55x}{24} = 55 \Rightarrow x = 24$$

$$\text{వ్యాపారము} = \frac{3}{8}x \\ = \frac{3}{8} \times 24 \\ = 9$$

168

$$\text{అధికారి} = \frac{a}{b}, \text{ విలోవు} = \frac{b}{a}$$

$$\frac{\frac{9}{5} \times \frac{9}{5} (\text{అధికారి})}{\frac{b}{9}} = 18 \frac{26}{27}$$

$$\left(\frac{a}{b}\right)^3 = \frac{512}{27}$$

$$\left(\frac{a}{b}\right)^3 = \left(\frac{8}{3}\right)^3$$

$$\frac{a}{b} = \frac{8}{3} = 2 \frac{2}{3}$$

169

Exampaper

50marks

సంఘ-స్పష్టవ్రత్తులు

47-14 = 33

50 → 33

$$10 \rightarrow ? = \frac{10 \times 33}{50} = 6.6$$

170

$$\frac{1}{3}N = \frac{1}{2}P$$

$$\frac{N}{P} = \frac{3}{2}$$

$$N:P = 3:2$$

$$P = \frac{2}{5} \times 150,000$$

$$= 60,000$$

171

x వుండి

తెలుగు  
1వంటివింగొవారు  
(x-1)వంటి

$$\text{Cake} \quad \frac{1}{4} \qquad \frac{3}{4}$$

$$(x-1)\text{వంటి} \rightarrow \frac{3}{4} \text{వట్టం}$$

$$1\text{వంటి} \rightarrow ? = \frac{3}{4(x-1)}$$

$$3(\text{వింగొవారు}) = \text{తొక్కువట్టం}$$

$$3\left(\frac{3}{4(x-1)}\right) = \frac{1}{4}$$

$$? = x-1$$

$$? = 10$$

172



$$\text{శతాబ्दి}, \frac{5}{4}x = x + \frac{5x}{4} = \frac{9x}{4}$$

$$\text{టాయి} = \frac{\frac{5x}{4}}{\frac{9x}{4}} = \frac{5}{9}$$

173

$$A = \frac{2}{3}B$$

$$A:B = 2:3$$

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

$$B:C = 1:4$$

$$A:B:C =$$

$$\begin{array}{c} 2 : 8 \\ \hline 2 : 3 : 12 \end{array}$$

$$B\text{వట్టం} = \frac{3}{17} \times 1360 = 240$$

174

$$A = \frac{2}{3}V$$

$$A:V = 2:3$$

$$V = \frac{1}{2}T$$

$$V:T = 1:2$$

$$A:V:T =$$

$$\begin{array}{c} 2 : 8 \\ \hline 2 : 3 : 6 \end{array}$$

$$\text{Veena} = \frac{3}{11}$$

175  $135 \text{ ల్ర} \rightarrow \frac{1}{4} \text{ వంతు}$

$180 \text{ ల్ర} \rightarrow ?$

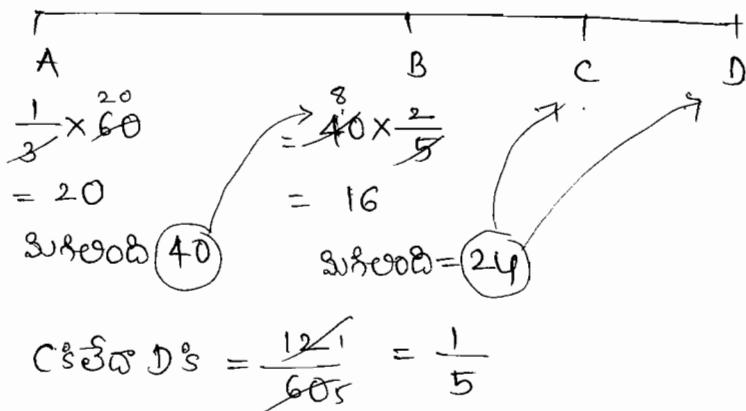
$$= \frac{180 \times \frac{1}{4}}{+35} = \frac{1}{3} \text{ వంతు}$$

$5 \rightarrow 500$

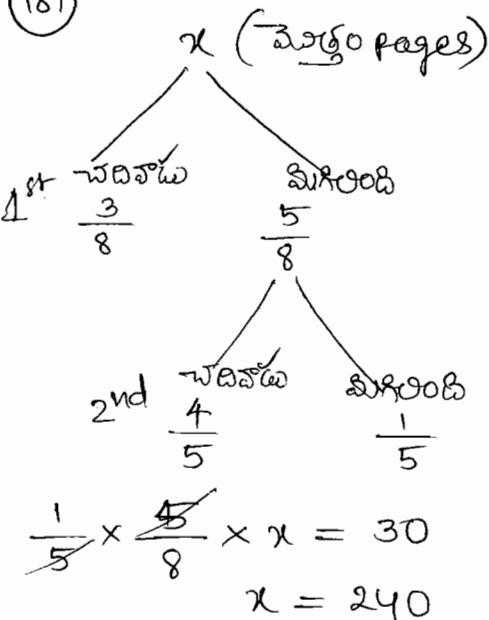
$$2 \rightarrow ? = \frac{2 \times 500}{5} = 200$$

180

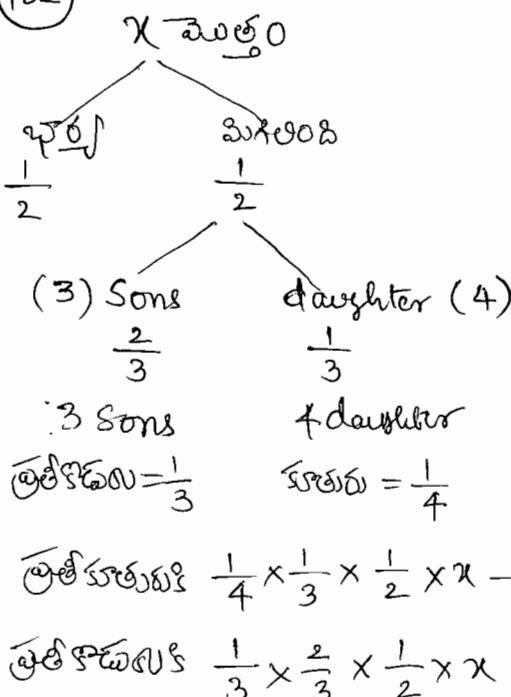
60 స్క్యూచ్ టీఎస్ (రసగువలు)



181



182



176 చ్యాంక్ వంతువాదా = x ల్ర.

$$\frac{6}{7}x - \frac{2}{5}x = 16 \text{ ల్ర.}$$

$$\frac{(30-14)x}{35} = 16$$

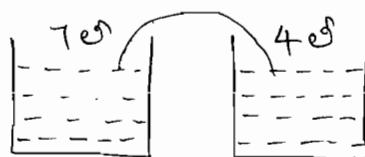
$$x = 35$$



$$\text{కసాగు} = \frac{4,7}{28 \text{ టీఎస్}} = 28 \text{ టీఎస్}$$

$$\text{ఇంటిచుట్టునుండి} = \frac{4}{28 \text{ టీఎస్}} = 4 \text{ ఎఫ్స్}$$

$$\text{శ్రీహర్షిచుట్టునుండి} = \frac{1}{4} \text{ ల్ర.} = 7 \text{ ల్ర.}$$



$$\text{ముఖ్యం} = \frac{3}{7}$$

178

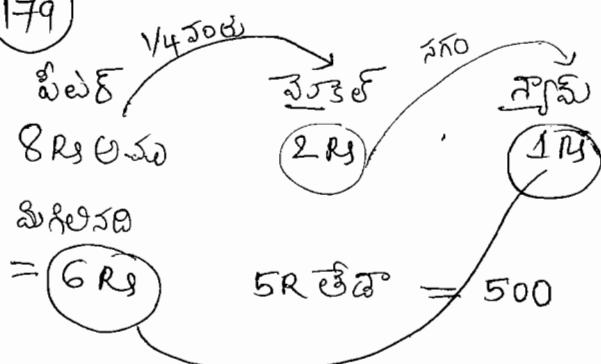
$$\text{ఒకెట్టుపలవాదా} \times \text{బక్కెట్సునాయి} = \text{మొత్తం నీరు}$$

$$x \times \frac{2}{5} = \frac{2}{5}x \times y$$

ముఖ్యం      Buckets      ముఖ్యం      Buckets

$$y = \frac{125}{x} = 62\frac{1}{2}$$

179



$$= \frac{20,000 \times \frac{1}{3} \times \frac{2}{3} \times \frac{1}{2} \times x}{\frac{1}{4} \times \frac{1}{3} \times \frac{1}{2} \times x}$$

$$= \frac{160000}{3} = 53,333$$

183

$$\frac{1}{5} \text{ వంతు చల్లరి} \Rightarrow 5 \text{ మంది చెళువు} \quad | \text{చెళువు}$$

$$\frac{1}{8} \text{ వంతు చల్లరి} \Rightarrow 8 \text{ మంది చెళువు} \quad | \text{చెళువు}$$

13 మంది	2 మంది
$\Rightarrow \frac{2}{13} \text{ మంది}$	

184

60 మంది మ.మ.

Frenchmen	French Women	NonFrench
$\frac{1}{5} \times 60$	$= 12 + \frac{2}{3} \times 12$	(28)
$= 12 \text{ మంది}$	$= 12 + 8$	
	$= 20 \text{ మంది}$	

$$\text{NonFrench} = \frac{28}{60, 15} = \frac{7}{15}$$

185

$$180 \text{ మంది}$$

$G$ $= \frac{3}{5} \times 180$ $= 108$	$B$ $= \frac{2}{5} \times 180$ $= 72 \text{ boys}$
Absent	Absent
$\frac{2}{9} = \frac{7}{9} \times 108$	$\frac{1}{4} = \frac{3}{4} \times 72$
$= 84$	$= 54$

$$\text{Present} = \frac{138}{180, 30} = \frac{23}{30}$$

(186)

$$\begin{array}{c} \text{వెత్తు} \\ \text{పెళ్ళినమారు} \\ 300 \\ \text{Boys} \quad \text{Girls} \\ 100 \quad 200 \end{array}$$

$$\begin{array}{c} \text{Boys} \quad \text{Girls} \\ \frac{1}{3} b = 100 \quad \frac{1}{2} g = 200 \\ b = 300 \quad g = 400 \\ \text{వెత్తు} = 700 \end{array}$$

187

$$\text{గీలిచే ల్యాప్ రోటింగ్ వ్యాసమాలు} = \frac{3}{4} \times 240 = 180 \text{ లోడ్}$$

$$4, 3, 6 = 24$$

వెత్తు 240 లోడ్ మానువు

$$1^{\text{st}} \text{ దశ} - ① \frac{2}{3} \times 240 = 160 \text{ లోడ్ మానువు}.$$

$$\text{గీలిచే ల్యాప్ రోటింగ్ వ్యాసమాలు} = \frac{5}{6} \times 240 = 200 \text{ లోడ్ మానువు}$$

$$= \frac{5}{6} \times 180 = 150$$

$$\text{ఇంకా లోడ్ కొన్సెట్ రోల్పు} = 240 - 150 = 90$$

$$2^{\text{nd}} \text{ దశ} - ② \text{ ఇంకా లోడ్ కొన్సెట్ రోల్పు} = 240 - 160 = 80$$

$$\text{గీలిచే వెట్టి రోల్పు} = \frac{30}{80} = \frac{3}{8}$$

OR

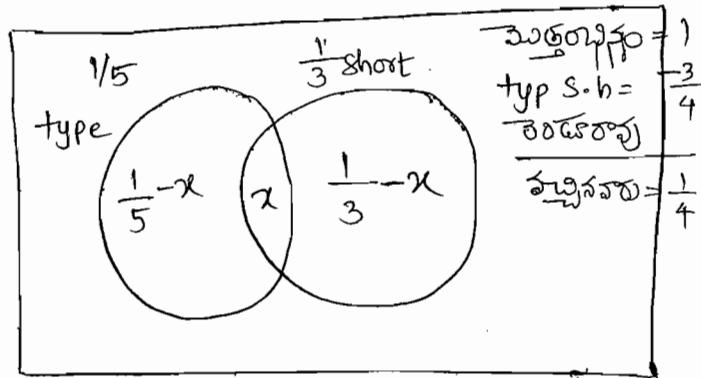
$$\begin{array}{c} x \\ \text{ఒకించిని} \quad \text{ఎక్కించిని} \\ \frac{2}{3} = \frac{1}{3} \\ = \frac{x}{3} \end{array}$$

$$\text{ఇంకా రోల్పు} = \frac{1}{2} \times \frac{2}{3} \times \frac{1}{2} = \frac{1}{6}$$

$$= \frac{x}{8}$$

$$= \frac{x/8}{x/3} = \frac{3}{8}$$

188



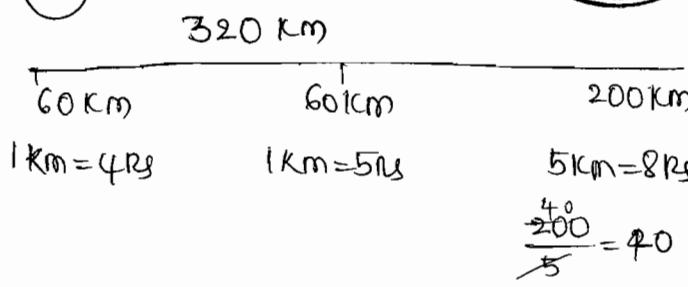
$$\frac{1}{5} - x + x + \frac{1}{3} - x = \frac{1}{4}$$

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

$$x = \frac{12 + 20 - 15}{60} =$$

$$x = \frac{17}{60}$$

189

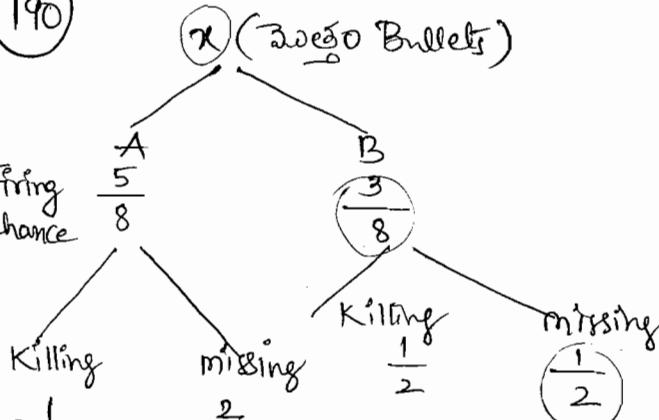


2000 रुपये की खरीदी = 860

$$\text{विवरण} = \frac{1}{4} (860) = 215$$

$$\text{मूल्य} = 860 + 215 = 1075$$

190



$$= \frac{1}{2} \times \frac{3}{8} \times x = \frac{9}{16} x$$

(B miss chance)

$$x = 144$$

$$\text{A's Killing Chance} = \frac{1}{3} \times \frac{5}{8} \times 144$$

$$= 30$$

191

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

$$= \frac{40 + 45 + 48}{60}$$

$$\boxed{3, 4, 5}$$

$$1^{\text{st}} \text{ shirt} = \frac{133}{60}$$

$$60 \text{ shirts} = \frac{133}{60} \times 60$$

$$= 133$$

192

Go with Options

$$\text{मूल्य} = \frac{2}{24}$$

उत्तम = 24

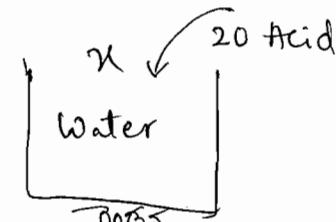
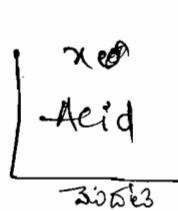
$$(b) \rightarrow \frac{87.5}{8}, \frac{83.33}{6}, \frac{75}{4}$$

$$(i) \frac{21 + 20 + 18}{24} = \frac{59}{24} = 2 \frac{11}{24}$$

$$(ii) \frac{\frac{7}{8}^2}{\frac{3}{4}} = \frac{7}{6}$$

$$(iii) \frac{7}{6} - \frac{5}{6} = \frac{2}{6} = \frac{1}{3}$$

193



$$1. x$$

$$2. x + \frac{2}{3}(x+20)$$

$$\text{मूल्य} = 4(\text{मूल्य})$$

$$1. x$$

$$2. (x+20)$$

$$3. \frac{2}{3}(x+20)$$

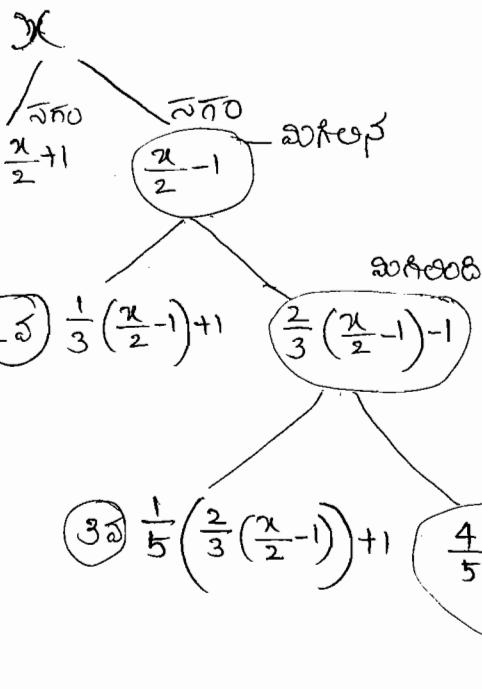
$$4. \text{विवरण} = \frac{1}{3}(x+20)$$

$$x + \frac{2}{3}(x+20) = 4 \left( \frac{1}{3}(x+20) \right)$$

$$3x + 2x + 40 = 4x + 80$$

$$x = 40$$

194



$$\frac{4}{5} \left( \frac{2}{3} \left( \frac{x}{2} - 1 \right) - 1 \right) - 1 = 3$$

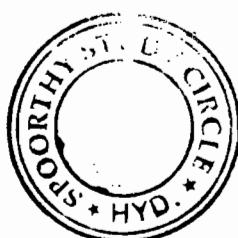
$$\frac{4}{5} \left( \frac{2}{3} \left( \frac{x}{2} - 1 \right) - 1 \right) = 4$$

$$\frac{2}{3} \left( \frac{x}{2} - 1 \right) = 6^{\frac{3}{5}}$$

$$\frac{x}{2} - 1 = 9$$

$$\frac{x}{2} = 10$$

$$x = 20 \text{ Apples.}$$



195

$$= \frac{(a+b)^2 + (a-b)^2}{a^2 + b^2}$$

$$= 2 \left( \frac{a^2 + b^2}{a^2 + b^2} \right)$$

$$= 2$$

196

$$= \frac{(a+b)^2 - (a-b)^2}{ab}$$

$$= \frac{4ab}{ab}$$

$$= 4$$

$$197 \quad a-b=3 \quad | \quad a^2+b^2=29$$

இரு விலை விடுதலையின்

$$a^2+b^2-2ab=9$$

$$29-2ab=9$$

$$2ab=20$$

$$ab=10$$

198

$$\frac{x^2 - 1^2}{x+1} = 4$$

$$\frac{(x+1)(x-1)}{x+1} = 4$$

$$x-1=4$$

$$x=5$$

199

$$= \frac{a^2 - b^2}{x^2 - y^2} \div \frac{a-b}{x-y}$$

$$= \frac{(a+b)(a-b)}{(x+y)(x-y)} \times \frac{x-y}{a-b}$$

$$= \frac{a+b}{x+y}$$

$$= \frac{3\frac{2}{3} + 2\frac{1}{2}}{4\frac{3}{4} + 3\frac{1}{3}} = \frac{\frac{11}{3} + \frac{5}{2}}{\frac{19}{4} + \frac{10}{3}}$$

$$= \frac{37}{61} \times \frac{12}{17}$$

$$= \frac{74}{97}$$

200

Next page

$$1 + \frac{1}{1 + \frac{1}{100}} = a, \quad 1 - \frac{1}{1 + \frac{1}{100}} = b$$

$$= \frac{a^2 - b^2}{a+b}$$

$$= \frac{(a+b)(a-b)}{(a+b)}$$

$$= a-b$$

$$\left| \begin{array}{l} a-b = \cancel{1+\frac{1}{100}} - \cancel{1-\frac{1}{100}} \\ \qquad\qquad\qquad = \frac{\cancel{2}}{\cancel{101}} \\ \qquad\qquad\qquad = \frac{200}{101} \end{array} \right.$$

(201)

$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2(ab+bc+ca)$$

$$\underbrace{13^2}_{(-)} = 69 + 2(ab+bc+ca)$$

$$169 - 69 = 2(ab+bc+ca)$$

$$ab+bc+ca = \frac{100}{2} \\ = 50$$



(202)

$$x^2 + y^2 + z^2 - 64 = -2(xy - yz - zx)$$

$$x^2 + y^2 + z^2 + 2xy - 2yz - 2zx = 64$$

$$(x+y-z)^2 = 8^2$$

$$x+y-z = 8$$

In Question  $x+y = 3z$

$$(x+y)-z = 8$$

$$3z - z = 8$$

$$2z = 8$$

$$z = 4$$

### Formulas

$$1. a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$

$$2. a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

$$(203) \quad = \frac{a^3 + b^3}{a^2 + b^2 - ab}$$

$$= a+b$$

$$= 185 + 435$$

$$= 1220$$

$$(204) \quad \frac{a^2 + ab + b^2}{a^3 - b^3} = \frac{1}{a-b}$$

$$= \frac{1}{147 - 143}$$

$$= \frac{1}{4}$$

$$(205) \quad a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

$$\frac{a^3 + b^3}{a^2 - ab + b^2} = a+b$$

$$\frac{13^3 + 7^3}{13^2 + 7^2 - ?} = (13+7)$$

$$a \times b = 13 \times 7 = 91$$

$$(206) \quad \frac{a^3 - b^3}{a^2 - b^2} = \frac{(a-b)(a^2 + ab + b^2)}{(a+b)(a-b)}$$

$$= \frac{\left(\frac{3}{5}\right)^2 + \frac{3}{5} \times \frac{2}{5} + \left(\frac{2}{5}\right)^2}{\frac{3}{5} + \frac{2}{5}}$$

$$= \frac{\frac{9}{25} + \frac{6}{25} + \frac{4}{25}}{\frac{5}{5}} = \frac{19}{25}$$

$$1. a^3 + b^3 + c^3 - 3abc = (a+b+c)(a^2 + b^2 + c^2 - ab - bc - ca)$$

$$2. \quad " \quad " = \frac{1}{2}(a+b+c)((a-b)^2 + (b-c)^2 + (c-a)^2)$$

$$3. a+b+c = 0$$

$$a^3 + b^3 + c^3 - 3abc = 0$$

$$4. a = b = c$$

$$a^3 + b^3 + c^3 - 3abc = 0$$

207

$$\begin{aligned}
 &= \frac{38^3 + 34^3 + 28^3 - 38 \times 34 \times 28 \times 84}{11} \\
 &= \frac{38^3 + 34^3 + 28^3 - 3 \times 38 \times 34 \times 28}{11} \\
 &= \frac{38^2 + 34^2 + 28^2 - 38 \times 34 - 34 \times 28 - 28 \times 38}{11} \\
 &= \frac{a^3 + b^3 + c^3 - 3abc}{a^2 + b^2 + c^2 - ab - bc - ca} \\
 &= a + b + c \\
 &= 38 + 34 + 28 \\
 &= 100
 \end{aligned}$$



208

$$\begin{aligned}
 a+b+c &= 0, \quad a^3 + b^3 + c^3 = 3abc \\
 -(x+y) + (y-z) + (z-x) &= 0 \Rightarrow (x-y)^3 + (y-z)^3 + (z-x)^3 \\
 &= 3(x-y)(y-z)(z-x) \\
 &= \frac{(x-y)^3 + (y-z)^3 + (z-x)^3}{9(x-y)(y-z)(z-x)} \\
 &= \frac{3}{9} = \frac{1}{3}
 \end{aligned}$$

209

$$\begin{aligned}
 1^{st} &= \frac{3}{11} x \quad \text{விரைவி } = \frac{8}{11} x \\
 2^{nd} &= \frac{3}{11} \times \frac{8}{11} x \\
 &= \frac{24}{121} x \\
 \frac{3x}{11} - \frac{24x}{121} &= 9 \\
 \frac{33x - 24x}{121} &= 9
 \end{aligned}$$

$$\frac{9x}{121} = 9$$

$$x = 121$$

210

$$\text{চার্ট+ এসোসিয়েশন চালুর } = 50 \text{ RS}$$

$$x \text{ RS} + \underbrace{3x(0.5 \text{ RS})}_{x+1.5x+1.4} + \underbrace{14(0.1 \text{ RS})}_{+0.2x} + \underbrace{4x(0.05 \text{ RS})}_{2x} = 50$$

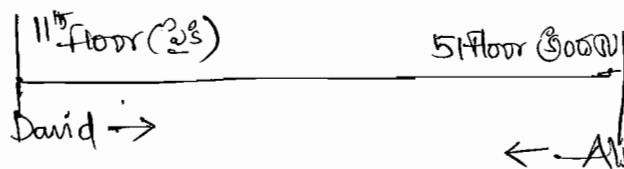
$$x + 1.5x + 1.4 + 0.2x = 50$$

$$2.7x = 48.6$$

$$x = \frac{48.6}{2.7}$$

$$x = 18$$

211



$$S_1 = 57 \text{ floors/min}$$

$$S_2 = 63 \text{ floors/min}$$

$$\text{সার্঵ক্ষণিক } = 57 + 63 = 120$$

$$(i) \text{ 100 মিনিটে } \frac{\text{প্রতি মিনিটে উচ্চতা পর্যায়}}{\text{স. ক্ষেত্র}} = \frac{2.5 \text{ ম. দূরত্ব}}{\text{স. ক্ষেত্র}}$$

$$= \frac{40 \text{ floors}}{\frac{120 \text{ floors}}{3} / \text{min}} = \frac{1}{3} \text{ min}$$

$$(ii) 11 \text{ ম ফ্লোর সুষ্ঠু } d = S \times t$$

$$= \frac{19}{57} \frac{\text{floors}}{\text{min}} \times \frac{1}{3} \text{ min}$$

$$= 11 \text{ m} + 19 \text{ m floors}$$

$$= 30^{\text{th}} \text{ floor.}$$

212

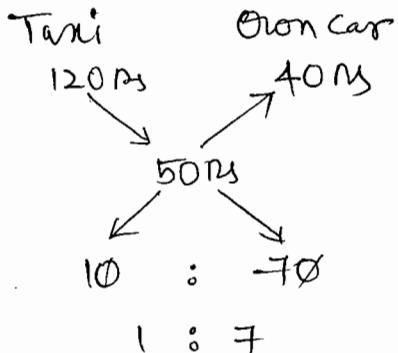


$$N \times 50 \text{ RS} = 0.25 \text{ latches}$$

$$N \times 50 = 2500 \text{ RS}$$

$$N = 500$$



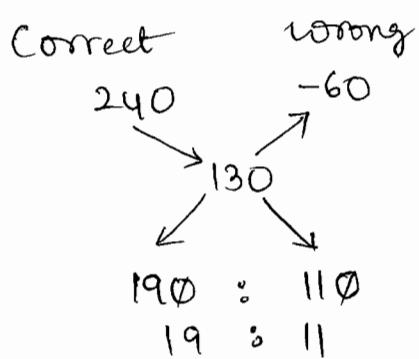


$$\text{Taxi} = \frac{1}{8} \times 80\text{km} = 10\text{km}$$

220

$$\text{మొత్త } 60 \text{ రూప్యాలు \text{Correct లభ్యం} = 60 \times 4 = 240$$

$$" " \text{Wrong} " = 60 \times -1 = -60$$



$$\text{Correct} = \frac{19}{30} \times 60 = 38$$

221

గొంతువులు

$$x+3 \\ \times 2$$

$$2(x+3) - 1(x) = 23$$

$$x = 17 \text{ (ఒడ్డు)}$$

కొన్సెప్చనలు

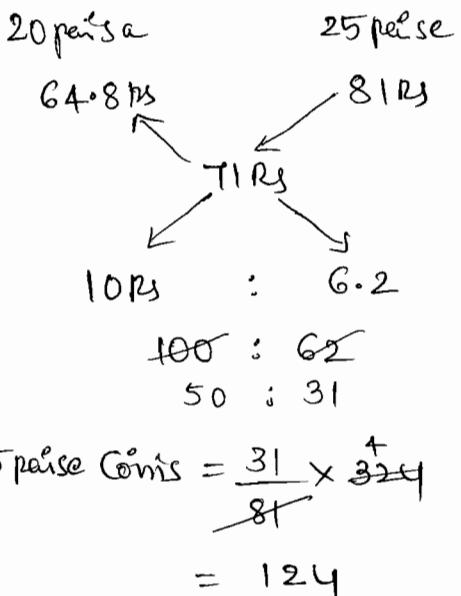
$$\begin{array}{c} x \\ \times \\ x-1 \end{array}$$

$$\text{గొంతువు } 20 + \text{ ఒడ్డు } 17 = 37 \text{ రూప్యాలు}$$

222

$$\text{మొత్త } 324 \text{ coins లల్పి } 20 \text{ p. లభ్యం} = 324 \times 20\text{p} \\ = 64.8 \text{ RS}$$

$$" " \text{ } 25 \text{ p. లభ్యం} = 324 \times 25\text{p} \\ = 81 \text{ RS.}$$



223

$$\begin{array}{ccc} 1\text{Rs} & 5\text{Rs} & 10\text{Rs} \\ x \text{notes} & x \text{notes} & x \text{notes} \end{array}$$

$$\text{Money} = 1x + 5x + 10x = 16x = 480 \\ 16x = 480 \\ x = 30$$

$$\text{మొత్తం సుధా } = 3x = 3 \times 30 = 90 \text{ సుధా.}$$

224

$$\begin{array}{c|c} \text{అసుధా} & \text{అసుధా} \\ 8 \text{ మంది} & 7 \text{ మంది} \end{array}$$

$$\text{Current} = 56 \text{ RS ల వ్యవహారము}$$

$$8 \text{ మంది } 56 \text{ RS ల కొట్టి వాటా } = 7 \text{ RS } \quad \text{పోలింగ్}$$

$$7 \text{ మంది } 56 \text{ RS ల కొట్టి వాటా } = 8 \text{ RS } \quad \text{పోలింగ్}$$

$$\text{పోలింగ్ భద్రత } = \frac{1}{7}$$

225

$$\text{మొత్తం శ్శైఫ్టు } = x \text{ అసుధా వాటా}$$

$$\frac{x}{140} - \frac{x}{175} = 4 \text{ sweets}$$

$$\begin{array}{l} 35 \times 4 = 140 \\ 35 \times 5 = 175 \end{array}$$

$$\frac{x}{35} \left( \frac{1}{4} - \frac{1}{5} \right) = 4$$

$$\frac{x}{35} \left( \frac{1}{20} \right) = 4$$

$$x = 35 \times 20 \times 4$$

$$x = 2800$$

వ్యవహరించు ప్రాణికి

96 Rs

Q26

మొత్తం ఖర్చు 96 Rs

Plan  $\rightarrow$   $x$  మంగళ.

$\rightarrow$  వ్యవసాయ  $(x-4)$  మంగళ.

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

Go దిగ్భిత్తి Options  $\Rightarrow x = 12$

$$\frac{96^2}{12-4} - \frac{96^2}{12} = 4$$

$$4 = 4$$

Plan  $= x = 12$

వ్యవసాయ  $= x-4 = 12-4 = 8$  మంగళ.

Q27

1<sup>st</sup> Case

టెల్ఫోన్ 450 Rs

2<sup>nd</sup> Case

450 Rs

మాటలపట్టి  $x$  మంగళ.

$(x+5)$  మంగళ.

టెల్ఫోన్ కు  $\frac{450}{x}$

$\frac{450}{x+5}$

$$\frac{450}{x} - \frac{450}{x+5} = 15 \text{ Rs}$$

Go దిగ్భిత్తి Options.  $\Rightarrow 10$   $(x=10)$

$$\frac{450}{10} - \frac{450}{10+5} = 15$$

$$45 - 30 = 15$$

$$15 = 15$$

Q28

1<sup>st</sup> Case

టెల్ఫోన్

35 Rs

2<sup>nd</sup> Case

35 Rs

పొదులు

$x$  లీలు

$(x+4)$  లీలు

టెల్ఫోన్ కు

$\frac{35}{x}$  ఎంచుకు

$\frac{35}{x+4}$  తించుకు

$$\frac{35}{x} - \frac{35}{x+4} = 1 \text{ Rs}$$

Go దిగ్భిత్తి Options  $\Rightarrow x = 10$  లీలు.

$$\frac{35}{10} - \frac{35}{10+4} = 1 \text{ Rs}$$

$$3.5 - 2.5 = 1 \text{ Rs}$$

$$1 = 1$$

Q29

$$10C = 4T$$

$$5C = 2T$$

$$5(\frac{100}{200}) = 2T$$

$$T = 500$$

$$15C + 2T = 4000$$

$$15C + 5C = 4000$$

$$20C = 4000$$

$$C = 200$$

$$12C + 3T = ?$$

$$12(200) + 3(500)$$

$$2400 + 1500$$

$$= 3900$$

Q30

$$90 = 5A$$

$$\frac{\Theta}{A} = \frac{5}{9}$$

$$\frac{\Theta}{A} \times \frac{A}{m} \times \frac{m}{L} = \frac{5}{9} \times \frac{3}{5} \times \frac{9}{4}$$

$$\frac{\Theta}{L} = \frac{3}{4} \Rightarrow O:L = 3:4$$

$$3 \text{ Lemons} \xrightarrow{\times 16} 4.8 \text{ Rs}$$

$$1 \text{ Lemon} \xrightarrow{\times 11} 1.6 \text{ Rs}$$

$$4 \text{ Oranges} \xrightarrow{\times 4} 1.6 \text{ Rs}$$

$$3 \text{ Oranges} \xrightarrow{\times 4} 1.2 \text{ Rs}$$

Q31

$a = 2b$ ,  $b$  ఒక వ్యవసాయ

$$2a + 4b = 1600 \quad 2a + 4b = 1(a+6b)$$

$$(a = 2b) \quad (-)$$

$$12b = ?$$

$$12b = 12 \times 200$$

$$= 2400$$

$$2(2b) + 4b = 1600$$

$$8b = 1600$$

$$b = 200$$

232

$$(2t + 3c = 3500) \times 2$$

$$(3t + 2c = 4000) \times 3$$

$$\rightarrow 9t + 6c = 12000$$

$$\rightarrow 4t + 6c = 1000$$

$$\underline{5t = 5000}$$

$$t = 1000$$

233

Tonii Charge = Fixed Charge + Km Charge

~~$$\text{Fixed} + 24 \text{ Km Charge} = 204$$~~

~~$$\text{Fixed} + 16 \text{ Km Charge} = 156$$~~

$$8 \text{ Km charge} = 48 \text{ Rs}$$

$$1 \text{ Km charge} = 6 \text{ Rs}$$

$$\rightarrow \text{Fixed} + 96 \text{ Rs} = 156 \text{ Rs}$$

$$\text{Fixed} = 60 \text{ Rs}$$

80 Km bill = Fixed + 30 Km charge

$$= 60 \text{ Rs} + 30 \times 6$$

$$= 60 + 180$$

$$= 240 \text{ Rs.}$$

234

வெளில்ளூர் கடமைவு

வெளில்ளூர்

ஒருமுனி

வொதுமுங்கி

$$(x+1)$$

$$6$$

$$6(x+1)$$

$$x$$

$$7$$

$$7x - 5$$

$$6x + 6 = 7x - 5$$

$$x = 11 \text{ வெளில்}$$

$$\text{வொதுமுங்கி} = 6(x+1)$$

$$= 6(11+1)$$

$$= 6(12)$$

$$= 72$$

235

$$\boxed{x \text{ முடி}}$$

A

$$\boxed{y \text{ முடி}}$$

B

$$\text{Case i: } x - 10 = y + 10$$

$$\text{Case ii: } x + 20 = 2(y - 20)$$

$$(x - y = 20) \times 2$$

$$\underline{x - 2y = -60}$$

$$x = 100$$

236

குறை

கால்வை

$$\text{குறை} x$$

$$y$$

$$\text{கால்வை} 4x$$

$$2y$$

$$\text{வொதுமுங்கி} = 2x(\text{குறை}) + 24$$

$$4x + 2y = 2(x+y) + 24$$

$$4x + 2y = 2x + 2y + 24$$

$$2x = 24$$

$$x = 12$$

237

குறை

கால்வை

$$\text{குறை} x$$

$$y$$

$$\text{கால்வை} 2x$$

$$4y$$

$$(x+y = 48) \quad | \quad 2x + 4y = 140$$

$$\times 2 \quad | \quad x + 2y = 70$$

$$2x + 2y = 96$$

$$\underline{x + 2y = 70}$$

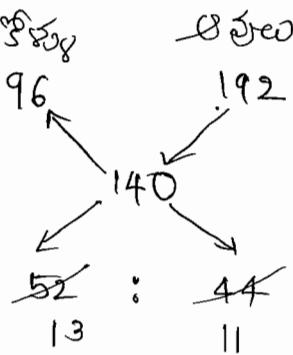
$$x = 26$$

OR

—Allegation method என கீழே வரும்.

$$48 \text{ రూప్య } \times 2 = 96$$

$$" " \times 4 = 48 \times 4 = 192$$



$$\text{శెస్టి} = \frac{13}{24} \times 48 = 26$$

$$\text{ఘర్షణ} = \frac{11}{24} \times 48 = 22$$

(238)

Sowmya      Vidisha

$$\text{చెమ్మ} - 100\text{Rs} \quad 100\text{Rs}$$

$$\text{మంచి} - x \text{ మంచి} \quad (x+5) \text{ మంచి}$$

$$\text{మంచికిట్టినడాన్ని} \frac{100}{x} \quad \frac{100}{x+5}$$

$\downarrow 4\text{Rs}$

$$\frac{100}{x} - \frac{100}{x+5} = 1\text{Rs}$$

Given Options  $\Rightarrow x = 20$  గుమా

$$\frac{100}{20} - \frac{100}{20+5} = 1\text{Rs}$$

$$5 - 4 = 1\text{Rs}$$

$$1 = 1$$

మొత్తం విరాళం జూదినవారు

$$= x + x + 5$$

$$= 20 + 20 + 5$$

$$= 45$$

# CLOCK'S

Hour Hand (గొండల మణి):

$$12 \text{ hours} \longrightarrow 360^\circ$$

$$1 \text{ hour} \longrightarrow 30^\circ$$

$$60 \text{ రిమిట్చు } \longrightarrow 30^\circ$$

$$1 \text{ రిమిట్చు } \longrightarrow ? = \frac{30^\circ}{60^\circ} = \frac{1^\circ}{2}$$

$$\text{గొండల మణి వేగం} = \frac{1^\circ}{2} / \text{min.}$$

Minute-Hand (రిమిట్చల మణి):

$$60 \text{ రిమిట్చు } \longrightarrow 360^\circ$$

$$1 \text{ రిమిట్చు } \longrightarrow 6^\circ$$

$$\text{రిమిట్చల మణి వేగం} = 6^\circ / \text{min}$$

$$\begin{aligned} \text{సాప్త వేగం} &= 6 - \frac{1^\circ}{2} \\ &= 5\frac{1}{2}^\circ \\ &= \frac{11^\circ}{2} \end{aligned}$$

\*\*\*



$$\boxed{\frac{11}{2} m = 30 h \pm \theta^\circ} \quad h : m$$

hours : minutes

I) గొండల మణి, రిమిట్చల మణి ఏకైకిమిశల్ క్రిందిని కనుమర్చించి తెలుస్తామి?

$$\text{కొణిస్టు} / \text{వీటిఫిరాయిల్ క్రిందిని } 0^\circ$$

II:

$$360^\circ \text{ కూర్చు}, \frac{11^\circ}{2} / \text{min} \text{ వీటిఫిరింగ్ అయిగేస్తే ఎట్టుకొలి$$

$$\begin{aligned} \text{కొలి} &= \frac{\text{కూర్చు}}{\text{వేగం}} = \frac{360^\circ}{\frac{11^\circ}{2} / \text{min}} = \frac{720}{11} \text{ min} \\ &= 65\frac{5}{11} \text{ min.} \end{aligned}$$

(3)

I) 12 గంచుల వ్యవధిలో బ్రాషార్టు లో భూషణాలు? = 11 సార్టు

II) 24 గం || " " " " = 22 సార్టు

III) 12 గం || వ్యవధిలో బ్రాషార్టు లో సరళతాకు ఉండుట - 22 సార్టు

IV) 24 గం || వ్యవధిలో బ్రాషార్టు లో " " " " ] - 44 సార్టు

V) 12 గం || వ్యవధిలో బ్రాషార్టు లో దాస్తుక్కు ప్రాయమాణ స్థితి ఉంటామి?

- 11 సార్టు

VI). 24 గం || " " " " ? - 22 సార్టు

VII). 12 గంచుల వ్యవధిలో బ్రాషార్టు లో దాస్తుక్కు వీటిక్కాంతి (30°, 40°, 60°) ... ?

- 22 సార్టు

VIII). 24 గం || వ్యవధిలో బ్రాషార్టు లో దాస్తుక్కు వీటిక్కాంతి (30°, 40°, 60°.....) ?

- 44 సార్టు.

R.S. AGGARWAL Book

① గొండల మణి 12 — 5 : 10

$$= 5 \text{ గం} || 10 \text{ రిమిట్చు}$$

$$= 5 \times 30^\circ + \frac{10}{60^\circ} \times 30^\circ$$

$$= 150 + 5$$

$$= 155^\circ$$

②

$$8 \text{ Am to } 2 \text{ pm} = 6 \text{ hrs}$$

$$\text{గొండల మణి} = 6 \times 30^\circ$$

$$= 180^\circ$$

R S Agarwal Bit to Bit by Sagar Sir @Spoorthy Ashok Nagar- 6303450967

	Topics	Questions
<b>Chapter-1</b>		
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	32 Stocks and Shares	25
	33 True Discount	17
	34 Banker's Discount	13
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	DATA INTERPRETATION	
	36 Tabulation	25
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	38 Pie Charts	30
	39 Line Graphs	35

**ARITHMETIC**  
**(R.S. AGGARWAL)**  
**BOOK (BIT TO BIT)**  
BY  
**శిజయ్ సాగర్** Sir,  
IIT, Kharagpur



**40 Days Batch**  
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**(Study Circle)**

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$$\textcircled{3} \quad \frac{11}{2} m = 30h \pm \theta$$

$$3 : 40 \\ h : m$$

\* \* Acute Angle — అట్లుకో  $< 90^\circ$

$$\cancel{\frac{11}{2} \times 40} = 30 \times 3 \pm \theta$$

$$220 - 90 = \theta$$

$$\theta = 130^\circ$$

$$\textcircled{4} \quad \frac{11}{2} m = 30h \pm \theta$$

$$8 : 30 \\ h : m$$

Obtuse Angle — అధికో  $> 90^\circ$

$$\cancel{\frac{11}{2} \times 30} = 30 \times 8 \pm \theta$$

$$165 = 240 \pm \theta$$

$$\theta = 240 - 165$$

$$\theta = 75^\circ$$



Right Angle — ఎంబోకో  $= 90^\circ$   
Straight Angle — సరళకోగో  $= 180^\circ$

Reflex Angle — పరావర్తనకో  $= 180^\circ - 360^\circ$

Complete II — సంపూర్ణకో  $= 360^\circ$

Complementary — పూర్ణకో  $\boxed{B}$   $A$   $A+B=90^\circ$

Supplementary — సంపూర్ణకో  $\boxed{B}$   $A$   $A+B=180^\circ$

$$\theta = 162.5^\circ$$

$$\text{పరావర్తనకో} = 360^\circ - 162.5^\circ \\ = 197.5^\circ$$

\textcircled{8}

22 సార్ల . న్యూఱ్యార్ల వీఫ్హాషాల (24 గం)

11 సార్ల మధ్యదేశాలి II (12 గం)

\textcircled{9}

న్యూఱ్యార్ల లోని సరళకోగో 44 సార్ల (24 గం)

\textcircled{10}

న్యూఱ్యార్ల లంబఠామక్కల ప్రాంతాలలో 44 సార్ల ప్రాంతాల.

\textcircled{11}

ప్రాంతాలలో 22 సార్ల ప్రాంతాల.

\textcircled{12}

12 గంటలలు — 11 సార్ల

24 గంటలలు — 22 సార్ల

$$= 65\frac{5}{11} - 64$$

$$= 1\frac{5}{11} \text{ min}$$

$$= \frac{16}{11} \text{ min} \times \frac{22}{22} \text{ min}$$

$$= 32 \text{ min.}$$

$$\textcircled{7} \quad \frac{11}{2} m = 30h \pm \theta$$

$$10 : 25 \\ h : m$$

\textcircled{6R}

$$\cancel{\frac{11}{2} \times 25} = 30 \times 10 \pm \theta$$

$$\cancel{\frac{275}{2}} = 300 \pm \theta$$

$$137.5 = 300 \pm \theta$$

$$\theta = 300 - 137.5$$

$$\text{ప్రతి } 64 \text{ రఘు} \longrightarrow \frac{16}{11} \text{ min / losses}$$

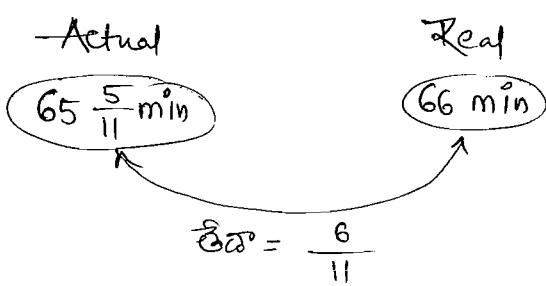
$$1820 = 24 \times 60 \text{ min} \longrightarrow ?$$

$$= \frac{24 \times 60}{694} \times \frac{16}{11}$$

$$= \frac{360}{11} = 32 \frac{8}{11}$$

But As per Book, Answer is wrong 32  
is the right Answer. If Bolts are  
indicates in Options you will choose  
32 Only.

3) ప్రతి 66 రఘు మాన్యం వీక్షణాన్ని రాశాలను  
తొందరగా గడియరా నటుస్తున్నారి?



$$\text{ప్రతి } 65 \frac{5}{11} \text{ min's} \longrightarrow \frac{6}{11} \text{ profit}$$

$$1820 \ 24 \times 60 \text{ min} \longrightarrow ?$$

$$= \frac{24 \times 60}{720} \times \frac{6}{11} = 12$$

3)  $3 : ?$   
 $h : m$ , వీక్షణాన్ని  $\theta = 0^\circ$

$$\boxed{\frac{11}{2} m = 30 h \pm \theta}$$

$$\frac{11}{2} m = 30 \times 3 \pm \theta$$

$$\frac{11}{2} m = 90 \pm \theta$$

$$m = \frac{180}{11} = 16 \frac{4}{11} \text{ రఘు}$$

$$3 \text{ గంటల } 16 \frac{4}{11} \text{ రఘుశాఖ}$$

14)  $9 : ?$   
 $h : m$ , వీక్షణాన్ని  $\theta = 0^\circ$

$$\frac{11}{2} m = 30 \times 9 \pm \theta$$

$$\frac{11}{2} m = 270 \pm \theta$$

$$m = \frac{540}{11} = 49 \frac{1}{11} \text{ min}$$

9 గంటల  $49 \frac{1}{11}$  రఘుశాఖ

15)  $7 : ?$   
 $h : m$ , వీక్షణాన్ని  $\theta = 180^\circ$

$$\frac{11}{2} m = 30 \times 7 \pm 180^\circ$$

$$\frac{11}{2} m = 210 - 180$$

$$\frac{11}{2} m = 30$$

$$m = \frac{60}{11} = 5 \frac{5}{11} \text{ రఘుశాఖ}$$

7 గంటల  $5 \frac{5}{11}$  రఘుశాఖ

ఈ కాట +, - చెరువుల తేస్తే కొన్నాయి.

16)  $4 : ?$   
 $h : m$ , వీక్షణాన్ని  $\theta = 180^\circ$

$$\frac{11}{2} m = 30 \times 4 \pm 180^\circ$$

$$\frac{11}{2} m = 120 \pm 180^\circ$$

$$\frac{11}{2} m = 120 + 180$$

$$\frac{11}{2} m = 300$$

$$m = \frac{600}{11} = 54 \frac{6}{11}$$

17)  $h : m$   
 $\frac{11}{5} : ?$  వీక్షణాన్ని  $\theta = 90^\circ$

$$\frac{11}{2} m = 30 \times 5 \pm 90^\circ$$

$$\frac{11}{2} m = 150 \pm 90$$

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

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

5 గంటల  $43 \frac{7}{11}$

(18) Monday 12 pm next Monday 2 pm

$$= 7 \text{ days} + 2 \text{ hrs}$$

$$= 7 \times 24 \text{ hrs} + 2 \text{ hrs}$$

$$= 170 \text{ hours.}$$

$$\text{Lapse} = 2 \text{ min} + 4 \text{ min} + \frac{\frac{4}{48} \text{ sec}}{60} = \frac{34}{5} \text{ min}$$

$$\text{Gap} \frac{34}{5} \text{ min} \xrightarrow{\text{Time}} 170 \text{ hours}$$

$$2 \text{ pm} \xrightarrow{\quad ? \quad}$$

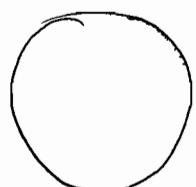
$$= \cancel{2} \times \frac{10}{170} \times 5 = 50 \text{ hrs} \Rightarrow 2 \text{ days} + 2 \text{ hrs.}$$

$$= \text{Monday 12 pm} + 2 \text{ days} 2 \text{ hrs.}$$

$$= \text{Wednesday 2 pm}$$

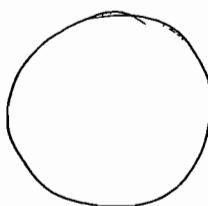


(19)



Incorrect time

$$= 3 \text{ min } 5 \text{ sec}$$



True time. 3 min

$$= 3 \text{ min } \frac{51}{60} =$$

$$= \frac{37}{12} \text{ min} \Rightarrow 7 \text{ AM} \rightarrow 4:15 = 9 \text{ hours } 15 \text{ min}$$

$$= (555 \text{ p.m.})$$

$$\frac{37}{12} \text{ min} \xrightarrow{\quad} 555 \text{ p.m.}$$

$$3 \text{ min} \xrightarrow{\quad ? \quad} = \frac{3 \times 555 \times 12}{37}$$

$$= 540$$

$$= \frac{540}{60} = 9 \text{ hours}$$

$$= 7 \text{ AM} + 9 \text{ hours}$$

$$= 4 \text{ PM}$$

# CALENDAR

1).

Odd Days : ಅಡ್ಡಲ್ಪಿಗೆ ಒಂದು ಖಚಿತವಾಗಿ ವರ್ಷದಲ್ಲಿ ಇರುವ ದಿನಗಳನ್ನು ಕರ್ತೃತ್ವದಲ್ಲಿ ಪಡೆಯಬಹುದಿಲ್ಲ.

$$\text{Ex: } 5200_{\text{base}} = 1) \underline{\underline{52}}(1$$

2)

Non Leap year = 365 days = 52 weeks + 1 odd day	Leap Year = 366 days = 52 weeks + 2 odd days
---	--

3). 1<sup>st</sup> Calender Started with "Sunday".

↳ ఈనో లీప్ యీర్ నా టెడ్ బిగ్ తెలుగులంకే

ಫಲ್ತು ಖರ್ಚಿನಾದಾಲು. ~~ಅಥವ್~~

H. - Leap :-

\* 4-చే భూగొణమయితే - Leap      } Except  
 4-చే భూగొణమయికలేవేతే - non leap      } నత్తెచ్చుట.

\* నత్తెచ్చుట అను 400-చే భూగొణమయితే - Leap  
 "        " 400చే భూగొణమయికలేవేతే - NLP

Ex: 3000 ଶତହିଁ,  $\frac{3000}{100} \neq 3$  କାହା

$$2000 \text{ Tage} = \frac{2000}{400} = 5 \cdot \text{Leap}$$

$$\therefore \text{कैफियत} = 100 - 25 = 75$$

$$24 \text{ Leap} \quad 76 \text{ Non Leap}$$

$$\frac{48}{x} = 6 \left( \frac{2}{\sqrt{10}} \right) \quad \frac{76}{x} = 6 \left( \frac{3}{\sqrt{10}} \right)$$

$$\text{Total odd days} = 6 + 6 = \frac{12}{7} = 5 (\text{Sunday})$$

~~不~~ sup.

- (1) പുത്രി 100 സെറി ലീസ് — 5 odd days

(2) പുത്രി 200 സെറി ലീസ് — 3 odd days

(3) " 300 " — 1 odd day

(4) " 400 " — 0 odd days

\* తెల్పి 400 సంగాన్కసా 8 (Calendar Repeat  
ఉపయుక్తం.

水\*

		Days	Odd Days
Jan	-	31	$\frac{3x}{4}$
Feb	-	28 (29)	0
Mar	-	31	3
Apr	-	30	2
May	-	31	3
June	-	30	2
July	-	31	3
Aug	-	31	3
Sep	-	30	2
Oct	-	31	3
Nov	-	30	2
Dec	-	31	3

$$\text{Non leap } \frac{29}{7} = 1 \text{ odd days}$$

$$2538 \text{ Leap year days} = \frac{35}{7} = 20 \text{ odd days}$$

## Examples

(1) 15<sup>th</sup> August 1947 falls on which day?

1946 - 1600 + 300 + 46

$$= \text{Odd days} + 10 \text{ odd} + 140$$

$$= 2 + 3$$

= 500 days.

$$\begin{aligned} &= \text{Sunday} + 5 \\ &= \text{Friday} \end{aligned}$$

$$\frac{46}{4} = 11$$

	1947 - nonleap
J	- 3
F	- 0
M	- 3
A	- 2
M	- 3
J	- 2
J	- 3
A	- 15
	$\frac{31}{7} = 3$

$$\begin{array}{ll} 46 & \\ \swarrow & \searrow \\ 11 \text{ Leap} & 35 \text{ Nonleap} \\ = 11 \times 2 \text{ days} & = 35 \times 1 \text{ day} \\ = 22 \text{ days} & = 35 \text{ days} \\ = \frac{22}{7} = & = \frac{35}{7} \\ = 1 \text{ day} & = 0 \text{ days} \end{array}$$

③ 12<sup>th</sup> Oct 2018 which day?

$$\begin{aligned} 2017 &= 2000 + 17 \\ &= 0 + 1 + 6 \\ &= 7 \\ &= 0 + 5 \\ &= S + 5 \\ &= \text{Friday} \end{aligned}$$

$$\begin{array}{ll} 17 & \\ \swarrow & \searrow \\ 4 & 13 \\ \times 2 & \times 1 \\ \hline 8 & 13 \\ 8 = 1 & \hline 12 = 6 \\ 7 & 7 \end{array}$$

Jan - 3

F - 0

m - 3

A - 2

m - 3

J - 2

J - 3

A - 3

S - 2

O - 3



$$\frac{38}{7} = 5$$

\*\*

R.S Aggarwal Book

	1948 Leap nonleap
J	- 3
f	- 0
m	- 3
A	- 2
m	- 3
J	- 2
J	- 3
A	- 3
S	- 2
O	- 3
N	- <del>25</del> = 5
	$\frac{29}{7} = 1$

$$\begin{array}{ll} 48 & \\ \swarrow & \searrow \\ 12 \text{ leap} & 36 \text{ NL} \\ = 12 \times 2 & = 36 \times 1 \\ = \frac{24}{7} & = \frac{36}{7} \\ = 3 & = 1 \text{ day} \end{array}$$

① Jan 1<sup>st</sup> 2007 - nonleap  $\rightarrow$  1 odd day  
 = Monday + 1  
 = Tuesday

② Jan 1 2008 - Leap  $\rightarrow$  2 odd days  
 Jan 1 2009 - Nonleap  $\rightarrow$  2 odd days  
 = Tuesday + 2  
 = Thursday

③ 8<sup>th</sup> Dec 2007 → Saturday  
 8<sup>th</sup> Dec 2006 ← +1

$$= \text{Saturday} - 1 \\ = \text{Friday.}$$

④ 6 march 2005 (non leap) ← +1  
 6 march 2004 (Leap)  
 (Feb 29<sup>th</sup> not included)

$$= \text{Monday} - 1 \\ = \text{Sunday.}$$

⑤

		odd days
2007	—	1
8	—	2
9	—	1
10	—	1
11	—	1
12	—	2
13	—	1
14	—	1
15	—	1
16	—	2
17	—	1
		$\frac{14}{7} = 0$



2017 සෙසු '0' odd days

2007 සෙසු 2018 න්‍යාය repeats.

⑥ April - 2001  
 2000 - 2000 (zero odd days)

2001 Jan Feb Mar Apr  
 $3 + 0 + 3 + 1 = \frac{7}{7} = \text{zero odd days}$   
 (Sunday + 0 odd days = Sunday)

2001 Jan Feb Mar Apr

$$3 + 0 + 3 + 4^{\text{th}} = \frac{10}{7} = 3 \text{ odd}$$

$$= \text{Sunday} + 3 \text{ odd days} = \text{Wednesday}$$

10, 4<sup>th</sup>, 11<sup>th</sup> .... repeats.

⑦

17 June 1998

$$1997 = 1600 + 300 + 97$$

$$= 0 + 1 + 6 + 3$$

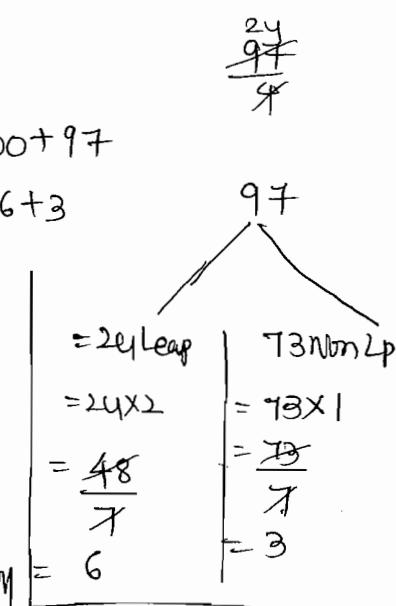
$$= \frac{10}{7}$$

$$= 3$$

$$= 3 + 0$$

$$= 3$$

$$\text{Sunday} + 3 \\ = \text{Wednesday}$$



Jan Feb Mar Apr May J

$$3 \quad 0 \quad 3 \quad 2 \quad 3 \quad 17 = \frac{28}{7} = 0$$

⑧

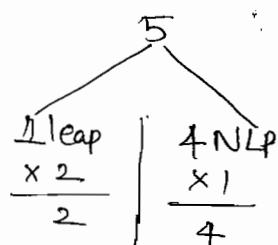
28 May 2006

$$2005 = 2000 + 5$$

$$= 0 \text{ odd} + 2 + 4$$

$$= 6$$

$$\frac{5}{4} = 1$$



Jan Feb Mar Apr May

$$3 + 0 + 3 + 2 + 28 = \frac{36}{7} = 1$$

$$= 6 + 1$$

$$= \frac{7}{7} = 0$$

$$= 5 + 0$$

$$= \text{Sunday.}$$

9) 15 Aug 2010

$$\frac{9}{4} = 2$$

$$9 \swarrow \searrow$$

$$\begin{array}{r} 2 \text{LP} \\ \times 2 \\ \hline 4 \end{array} \quad \begin{array}{r} 7 \text{NL} \\ \times 1 \\ \hline 7 = 0 \end{array}$$

$$\begin{aligned} 2009 &= 2000 + 9 \\ &= 0 + 4 + 0 \\ &= 4 + 3 \\ &= \frac{7}{4} = 0 \end{aligned}$$

Jan+Feb Mar Apr May J J A

$$3 + 0 + 3 + 2 + 3 + 2 + 3 + 15 = \overline{37} = 3$$

$$\begin{aligned} &= \text{Sunday} + 0 \\ &= \text{Sunday}. \end{aligned}$$

10)

$$\frac{61}{4} = 5 \text{ odd Days}$$

$$\begin{aligned} &= \text{Monday} + 5 \text{ days} \\ &= \text{Saturday}. \end{aligned}$$

11)

$$\text{Total 100 years} = 5 \text{ odd days}$$

$$\text{Sunday} + 5 = \text{Friday} - ①$$

$$\text{Total 200 years} = 3 \text{ odd Days}$$

$$\text{Sunday} + 3 = \text{Wednesday} - ②$$

$$\text{Total 300 years} = 1 \text{ odd Day}$$

$$\text{Sunday} + 1 = \text{Monday} - ③$$

$$\text{Total 400 years} = 0 \text{ odd Days}$$

$$\text{Sunday} + 0 = \text{Sunday} - ④$$

12) ಒಟ್ಟು 700 ವರ್ಷ 400 ಚೆ ಅಗಿಂದ  
ಚಕ್ರವ, ತಾವುನ Leap ಸೂಲ್ ಕಡು.

$$\begin{aligned} 13) \text{Total 82 years} &= x \text{ years} + x \text{ leap} \\ &= 7x \text{ years} + x \text{ leap} \\ &= 8x \text{ years} \end{aligned}$$

14)

2006 2007 2008 2009

$$1 + 1 + 2 + 1 = 5 \text{ odd days}$$

$$\text{Sunday} + 5 = \text{Friday}.$$

15)

$$\begin{array}{l} 8^{th} \text{ Feb } 2005 \leftarrow \\ 8^{th} \text{ Feb } 2004 (\text{Leap}) \rightarrow \text{Tuesday} \end{array}$$

(Feb 29 included)

$$\Rightarrow \text{Tuesday} - 2$$

$$= \text{Sunday}.$$

Q) ಶ್ರೀ ರಾಮನ ಪಿರಿಂಡ್ ಸಲರ್ಕ ಹೀಕ್ಕಿಲಾಡುನ್  
ಹೊಮ್ಮಿ?

(A) June, October (B) April, Nov

(C) Apr, July (D) Oct, Dec



# PERMUTATION - COMBINATION

Q) స్టోరు - నూబ్ 003గోలు

అనుమతి - నం డ్యూగ్లెస్  
అవసరం  
ఎన్నుకోవచ్చా.

$$1) nPr = \frac{n!}{(n-r)!}$$

Eg:  $7P_3 = \frac{7!}{(7-3)!} = \frac{7 \times 6 \times 5 \times 4!}{4!} = 7 \times 6 \times 5$

$52P_2 = 52 \times 51$  అసి కూడా రాయవచ్చు.

$$2) nCr = \frac{n!}{(n-r)! r!}$$

Eg:  $6C_2 = \frac{6!}{(6-2)! 2!} = \frac{6 \times 5 \times 4!}{4! 2 \times 1} = 15$

(OR)

$$6C_2 = \frac{6 \times 5}{2 \times 1} = 15$$

3)  $0! = 1, 1! = 1$

$nC_0 = 1, nC_n = 1, nC_1 = n$

$$4) nCr = nC_{n-r}$$

Eg:  $10C_7 = 10C_3$   
 $\text{తేడా} = 3$   
 $= \frac{10 \times 9 \times 8}{3 \times 2 \times 1} = 120$

# R.S. AGGARWAL Book

1)  $75P_2 = 75 \times 74 = 5550$

2) LOGARITHMS = 10! రకాగు అవున్నాయి.  
రాటి విప్పనా 4 అక్రమం =  $10P_4 = 10 \times 9 \times 8 \times 7 = 5040$

3) DELHI = 5! రకాగు  
= 120

4) APPLE =  $\frac{5! \text{ రకాగు}}{(P-\text{అడ్డంగా రాటి}) 2!} = \frac{120}{2} = 60$

5) LEADER =  $\frac{6!}{(E-\text{అడ్డంగా 2 రాటి}) 2!} = \frac{120}{2} = 360$

6) RUMOUR =  $\frac{6!}{(R-2 \text{ రాటి}, U-2 \text{ రాటి}) 2! 2!} = \frac{360}{2 \times 2} = 180$

7) ALLAHABAD =  $\frac{9!}{(A-4 \text{ రాటి}, L-2 \text{ రాటి}) 4! 2!}$

$$= \frac{9 \times 8 \times 7 \times 6 \times 5 \times 4!}{4! \times 2!} = 63 \times 120 = 7560$$

8) ENGINEERING =  $\frac{11!}{3! 3! 2! 2!}$   
E-3 రాటి, N-3 రాటి,  
I-2 రాటి, G-2 రాటి =

$$= \frac{11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4!}{6 \times 6 \times 2 \times 2} = 77 \times 18 \times 200 = 1386 \times 200 = 277200$$

## ⑨ SIGNATURE

(i) அமைப்புக்கான ஒரு வகுப்பு.

$$\text{SGNTR} \left( \begin{smallmatrix} 1 & 2 & 3 & 4 & 5 \\ 1 & 2 & 3 & 4 & 5 \\ \hline 6 \end{smallmatrix} \right) = \frac{6! \times 4!}{= 720 \times 24 \\ = 17280}$$

(ii) அமைப்புக்கான மாண்புகள்

= வீதித்தொகை - அமைப்புக்கான சீர்ப்பு

$$\begin{array}{l|l} \text{வீதித்தொகை} = 9! & = 362880 - 17280 \\ = 9 \times 8 \times 7 \times 720 & \\ = 362880 & = 345600 \end{array}$$

## ⑩ OPTICAL

$$\text{OPTCL} \left( \begin{smallmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 & 4 \\ \hline 5 \end{smallmatrix} \right) = \frac{5! \times 3!}{= 120 \times 6 \\ = 720}$$

## ⑪ SOFTWARE

$$\text{SOFTWR} \left( \begin{smallmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 & 4 & 5 \\ \hline 6 \end{smallmatrix} \right) = \frac{6! \times 3!}{= 720 \times 6 \\ = 4320}$$

## ⑫ LEARNING

$$\text{LDNG} \left( \begin{smallmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 & 4 \\ \hline 5 \end{smallmatrix} \right) = \frac{5! \times 3!}{= 120 \times 6 \\ = 720}$$

## ⑬ JDG

$$\text{JDG} \left( \begin{smallmatrix} 1 & 2 \\ 1 & 2 & 3 \\ \hline 4 \end{smallmatrix} \right) = \frac{4! \times 2!}{= 24 \times 2 \\ = 48}$$

## ⑭ ACTION

$$\text{CTN} \left( \begin{smallmatrix} 1 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 \\ \hline 4 \end{smallmatrix} \right) = \frac{4! \times 4!}{= 24 \times 24 \\ = 576}$$

## ⑮ BANKING

$$\text{BNKNG} \left( \begin{smallmatrix} 1 & 2 \\ 1 & 2 & 3 & 4 & 5 \\ \hline 6 \end{smallmatrix} \right) = \frac{6!}{2!} \times 2! = 720$$

## ⑯ CORPORATION

$$\text{CRPRTN} \left( \begin{smallmatrix} 1 & 2 & 3 & 4 & 5 \\ 1 & 2 & 3 & 4 & 5 & 6 \\ \hline 7 \end{smallmatrix} \right) = \frac{7!}{2!} \times \frac{5!}{3!} \Rightarrow \frac{7 \times 720}{2} \times \frac{120}{6} \\ = 7 \times 720 \times 10 = 50400$$

## ⑰ MATH MATICS

$$\text{MTH MATCS} \left( \begin{smallmatrix} 1 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ \hline 8 \end{smallmatrix} \right) = \frac{8!}{2!} \times \frac{4!}{2!} \\ = \frac{8 \times 7 \times 720 \times 24}{2 \times 2 \times 2} = 120960$$

## ⑱ DETAIL

$$\text{வீதித்தொகை} = E, A, I \quad \text{வீதித்தொகை} = D, T, L$$

வீதித்தொகை = E, A, I (ஒன்றுக்கான) =  $3P_3 = 3! = 6$

வீதித்தொகை = D, T, L (ஒன்றுக்கான) =  $3P_3 = 3! = 6$

வீதித்தொகை =  $6 \times 6 = 36$

## ⑲ MACHINE

$$\text{1, 2, } \left( \begin{smallmatrix} 3 \\ 1, 2 \end{smallmatrix} \right), 4, \left( \begin{smallmatrix} 5 \\ 1, 2 \end{smallmatrix} \right), 6, \left( \begin{smallmatrix} 7 \\ 1, 2 \end{smallmatrix} \right)$$

అమ్మాలు = A, I, E (చేసినట్టనామ = 4)

$$= 4P_3 = 4 \times 3 \times 2 = 24$$

వైభవాలు = M, C, H, N (నంణికాలు = 3)

$$= 4P_4 = 4! = 24$$

$$\text{మొత్త} = 24 \times 24 = 576$$

20)

పరియు అనగ = 'x' లనల్ఫూ  
తేడా అనగ = '+' లనల్ఫూ

1 లుపుఫూ

5 లుపుఫూ వరియు

$$= 7C_5$$

$$= 7C_2 \times 3C_1$$

$$= \frac{7 \times 6^3}{2 \times 1} \times 3 = 63$$

8 లుపుఫూ

5 లుపుఫూ వరియు

$$= 8C_5$$

$$= 8C_3$$

$$= \frac{8 \times 7 \times 6}{3 \times 2 \times 1}$$

$$= 56 \times 210$$

$$= 11760$$

5 member

0, 1, 2) At most 2 = ప్రశ్నలయితి 2 ద్వారా.

1, 3, 4, 5) At Least 2 = రసిను 2 ద్వారా

(22)  $1 \text{ లుపుఫూ } 6 \text{ ప్రీఫూ } = 5 \text{ స్థాయిము}$

= (3 లుపుఫూ 2 ప్రీ) తేడా (4 లుపుఫూ 1 ప్రీ) తేడా (5 లుపుఫూ)

$$= (1C_3 \times 6C_2) + \frac{(7C_4 \times 6C_1)}{7C_3} + \frac{7C_5}{7C_2}$$

$$= \frac{1 \times 6 \times 5}{3 \times 2 \times 1} \times \frac{6 \times 5}{2 \times 1} + \frac{1 \times 6 \times 5}{3 \times 2 \times 1} \times 6 + \frac{7 \times 6^3}{2 \times 1}$$

$$= 525 + 210 + 21$$

$$= 756$$

23) రసిను 1 చూచడానికి ప్రారంభ.

6 చూచులు 4 చూచులు = 4 ప్రథమ స్థాయిము,

$$= (1B \& 3g) \text{ or } (2b \& 2g) \text{ or } (3B \& 1g) \text{ or } (4b)$$

$$= (6C_1 \times 4C_3) + (6C_2 \times 4C_2) + (6C_3 \times 4C_1) + 6C_4$$

$\downarrow$   
4C<sub>1</sub>

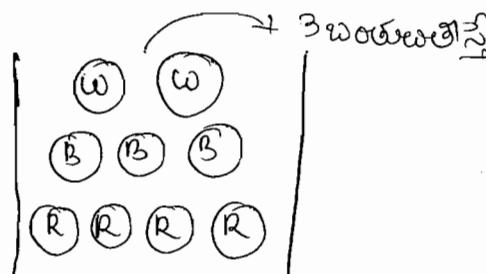
$\downarrow$   
6C<sub>2</sub>

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

$$= 24 + 90 + 80 + 15$$

$$= 209$$

24)



Black = 3, Non Black = 6

= (1 Black & 2 non black) or (2 black & 1 non black)  
or (3 black)

$$= (3C_1 \times 6C_2) + (3C_2 \times 6C_1) + 3C_3$$

$\downarrow$   
3C<sub>1</sub>

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

$$= 210 \times 5!$$

$$= 210 \times 120$$

$$= 25200$$

$$= 45 + 18 + 1 \\ = 64$$

25) 2, 3, ~~4~~, 6, 7, 9

$$\begin{array}{r} 4 \text{ వేళలు } \\ \downarrow \\ \hline \text{వారా } \end{array} \quad \begin{array}{r} 5 \text{ వేళలు } \\ \downarrow \\ \hline \text{వారా } \end{array} \quad \begin{array}{r} 5 \\ \hline 25! \end{array}$$

$$= 4 \times 5 \times 1 \\ = 20$$

26) H E H E H E ..... H E H

English = 21 Books

Hindi = 22 positions అట్టి

(E E E E .. 25)

19 Hindi Books తో 22 positions కి || చేయవచ్చు.

$$= 22 C_{19}$$

$$= 22 C_3$$

$$= \frac{22 \times 21 \times 20}{3 \times 2 \times 1} = 1540$$

~~7 వేళలు~~

~~4 వేళలు~~

$$= 7 C_3 \times 4 C_2$$

$$= \frac{7 \times 6 \times 5}{3 \times 2 \times 1} \times \frac{4 \times 3}{2 \times 1} = 210$$

$$\overbrace{1 \quad 2 \quad 3 \quad 4 \quad 5} = 5! \text{ వేళలు}$$

$$210 \text{ వారా } (3 \text{ వేళలు} + 2 \text{ వేళలు})$$



# PROBABILITY

Probability =  $\frac{\text{అసరులగా టీస్ లందియాల}}{\text{మొత్తం సంఖ్యలు}}$   
 $= \frac{\text{Favourable Events}}{\text{Total Events}}$

2)  $P(E) = 0 - 1$  వధ్యస్తండ్చన.

3)  $P(E) = 1 - P(\bar{E})$

4)  $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

## COIN (కొణి) :-

$n$ -వారిం ఎగర్చి మొత్తం సంఖ్యలు  $= 2^n$

- 1). 1 Coin = { Head, Tail }
- 2). 2 Coin = { HH, TT, HT, TH }

- 3). 3 Coin = {  
 H H H  
 H H T  
 H T H  
 H T T  
 T H H  
 T H T  
 T T H  
 T T T }

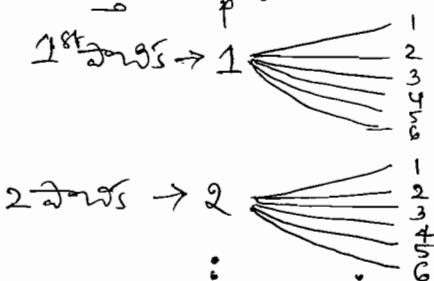


## DICE (పోషక) :-

$n$  పోషక జూల్స్ లో మొత్తం సంఖ్యలు  $= 6^n$

- 1) 1 పోషక మొత్తం సంఖ్యలు = { 1, 2, 3, 4, 5, 6 }

- 2) 2 పోషక మొత్తం సంఖ్యలు 36



## CARDS

Cards (52)

26 Red		26 Black	
13	13	13	13
Hearts	Diamond	spade	Clubs
◆	◆	◆	◆
Ace	A	A	A
King	K	K	K
Queen	Q	Q	Q
Jockey	J	J	J
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10

## R.S. Aggarwal Book

- 1) 2 వారిం మొత్తం సంఖ్యలు = { HH, TT, TH, HT } = 4

(తనిసు 1 head) అసరుల సంఖ్యలు = { HH, HT, TH } = 3

$$P = \frac{\text{favour}}{\text{Total}} = \frac{3}{4}$$

- 2) మొత్తం సంఖ్యలు = 8 {  
 H H H  
 H H T  
 H T H  
 H T T  
 T H H  
 T H T  
 T T H  
 T T T }

$$\text{సంఖ్య స్తరం } P = \frac{\text{favour}}{\text{Total}} = \frac{4}{8} = \frac{1}{2}$$

At least 2 = తనిసు 2 (2 గుంతంటి వాయిద)

At most 2 = మహాయాత్రి 2 (2, 1, 0)

\* Imp

③ వెంత్రుసంచాల = 8

H	H	H
H	H	T
H	T	H
H	T	T
T	H	H
T	H	T
T	T	H
T	T	T

(మహాభక్తి 2)

$$P = \frac{\text{favour}}{\text{Total}} = \frac{7}{8}$$

④ వెంత్రుసంచాల = 6

అనుమతిలంగా (4 రంటోపద్ధతి) = {5, 6}

$$P = \frac{\text{favour}}{\text{Total}} = \frac{2/1}{8/3} = \frac{1}{3}$$

⑤ వెంత్రుసంచాల =  $6^2 = 36$

అనుమతిలంగా ( $\text{వెంత్రు} = 7$ )

1 <sup>st</sup> వాళ్ళ	2 <sup>nd</sup> వాళ్ళ	1 <sup>st</sup>	2 <sup>nd</sup>		
6	1	= 7	}	1	6
5	2	= 7		2	5
4	3	= 7		3	4

$$P = \frac{\text{favour}}{\text{Total}} = \frac{6/1}{36/4} = \frac{1}{6}$$

⑥

1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>
6	3	3	6
5	4	4	5

సంఖ్యవ్రత =  $\frac{\text{అనుమతిలంగా వున్న సంచాల}{\text{వెంత్రుసంచాల}}$

$$= \frac{4/1}{36/4} = \frac{1}{9}$$

⑦

1 <sup>st</sup>	2 <sup>nd</sup>
1	1
2	2
3	3
4	4
5	5
6	6

$$\text{సంఖ్యవ్రత} = \frac{\text{అ.సంచాల}}{\text{మొ.సంచాల}}$$

$$= \frac{6/1}{36/6}$$

$$= \frac{1}{6}$$

⑧

మొత్తం = 10	మొత్తం = 11
1 <sup>st</sup>	2 <sup>nd</sup>
6	4
4	6
5	5

టై = +

$$\text{సంఖ్యవ్రత} = \frac{\text{అ.సంచాల}}{\text{మొ.సంచాల}} = \frac{5}{36}$$

⑨ మొదటి లభ్యం = సంసార్య

మొదటి ఉన్నం = చేసినంశ్య

1 <sup>st</sup>	2 <sup>nd</sup>
1	1
x	3
x	5
3	1
x	3
x	5
5	1
x	3
x	5

చేసినంశ్య

9

సంసార్య =  $36 - 9 = 27$

$$\text{సంఖ్యవ్రత} = \frac{\text{అ.సంచాల}}{\text{మొ.సంచాల}} = \frac{3/4}{36/4} = \frac{3}{4}$$

⑩

$$\text{సంఖ్యవ్రత} = \frac{\text{అనుమతిలంగా లేని సంచాల}}{\text{వెంత్రుసంచాల}}$$

$$= \frac{6/3}{20/10} = \frac{3}{10}$$

3 గుర్తించి (upto 20), 3, 6, 9, 12, 15, 18

⑪

3 గుర్తించి	5 గుర్తించి
3, 6, 9, 12, 15, 18	5, 10, 15, 20

$$\text{సంఖ్యవ్రత} = \frac{\text{అ.సంచాల}}{\text{మొ.సంచాల}} = \frac{9}{20}$$

(OR)

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$= 6 + 4 - 1$$

$$= 9$$

(12)

Barze - 10	
Empty - 25	
→ పొత్తు = 35	

$$\text{సంఖ్య వ్యక్తి} = \frac{\text{అ|| ల011}}{\text{పొత్తు ల011}} = \frac{10C_1}{35C_1} = \frac{10^2}{35^2} = \frac{2}{7}$$

(13) Face Cards ( $A, K, Q, J = 4 \times 4 = 16$ )

$$\text{అష్టడసింగ్ సంఖ్య వ్యక్తి} = \frac{\text{అ|| ల011}}{\text{పొత్తు ల011}} = \frac{16}{52} = \frac{4}{13}$$

(14) Club Queen తేదా Heart King ఘటాల్సీ

$$1 \quad \text{తేదా} \quad 1 \\ \text{సంఖ్య వ్యక్తి} = \frac{\text{అ|| ల011}}{\text{పొత్తు ల011}} = \frac{2^1}{52^2} = \frac{1}{26}$$

(15) ఎయిచ్ తేదా కోడ్ అవడసింగ్ సంఖ్య వ్యక్తి

Red	King	Red & King
26	4	2
$(A \cup B) = P(A) + P(B) - P(A \cap B)$	$P(A)$	$P(B)$

$$\text{సంఖ్య వ్యక్తి} = \frac{28}{52} = \frac{7}{13}$$

(16) Number 10 తేదా Spade సంఖ్య వ్యక్తి =  $\frac{16}{52} = \frac{4}{13}$ 

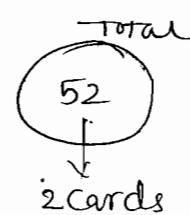
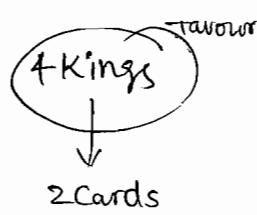
Number - 10	Spade	Number 10 & Spade
4	+	13
		1 = 16

(17) Diamond తేదా King సంఖ్య వ్యక్తి =  $\frac{16}{52} = \frac{4}{13}$ 

Diamonds	King	Diamond & King
13	+	4
	-	1 = 16

(18)

$$\text{మరియు} = X \\ \text{తేదా} = +$$



ఆస్తిన 2 వంటనల �Kings అష్టడసింగ్ సంఖ్య వ్యక్తి =

$$= \frac{4C_2}{52C_2} = \frac{\cancel{4} \times \cancel{3}}{\cancel{2} \times \cancel{1} \underbrace{\cancel{52} \times \cancel{51}}_{-2 \times 1} \cancel{17}} = \frac{1}{13 \times 17} = \frac{1}{221}$$

(19)

1 రెట్లు Spade మరియు 1 రెట్లు Heart

total (13)	$\downarrow$	favour (13)
total 52	$\downarrow$	1

$$\text{సంఖ్య వ్యక్తి} = \frac{13C_1 \times 13C_1}{52C_2}$$

$$= \frac{\cancel{13} \times 13}{\cancel{2} \times \cancel{52} \times \cancel{51}} = \frac{13}{102}$$

(20)

2 Red తేదా 2 King సంఖ్య వ్యక్తి =

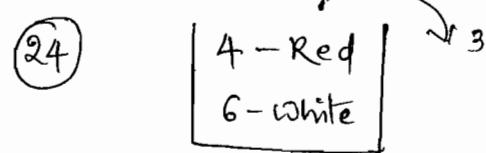
26 Red	$\downarrow$	favour	4 King	$\downarrow$	favour	2 Red + King	$\downarrow$
	2			2			2
	$26C_2$			$4C_2$			$2C_2$

$$= \frac{26C_2 + 4C_2 - 2C_2}{52C_2} = \frac{\cancel{26} \times \cancel{25}}{\cancel{2} \times \cancel{1}} + \frac{4 \times 3}{\cancel{2} \times \cancel{1}} = \frac{52 \times 51}{\cancel{2} \times \cancel{1}}$$

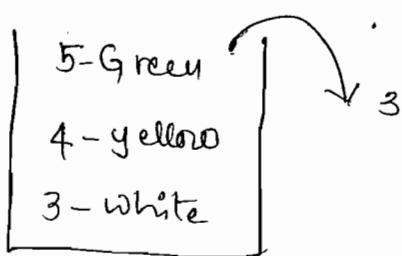
$$= \frac{650 + 12 - 2}{52 \times 51} = \frac{660}{52 \times 51} = \frac{55}{221}$$



$$\text{ತೆಯ್ಯಾಗ || ಸಂಖ್ಯೆ} = \frac{8C_1}{14C_1} = \frac{8}{14} = \frac{4}{7}$$



$$1 \text{ ಎರಡು ಮರಣು 2 ತೆಯ್ಯಾಗ} = \frac{4C_1 \times 6C_2}{10C_3}$$



ನೀವು ರೂಪ ಕಾರ್ಯಾಚಾರದಲ್ಲಿನಿಂದ =

$$\text{ನೀವು ರೂಪ - ತೆಯ್ಯಾಗ} = \frac{5C_3 + 4C_3 + 3C_3}{12C_3}$$

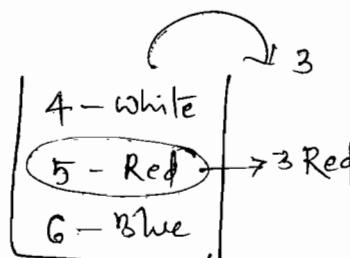
$$= \frac{5C_2 + 4C_1 + 3C_3}{12C_3}$$

$$= \frac{\frac{5 \times 4^2}{2 \times 1} + 4 + 1}{\frac{2 \times 11 \times 10}{3 \times 2 \times 1}}$$

$$= \frac{\frac{3}{15}}{\frac{220}{44}} = \frac{3}{44}$$

$$\text{ನೀವು ರೂಪ - ತೆಯ್ಯಾಗ} \text{ ಕಾರ್ಯಾಚಾರದಲ್ಲಿನಿಂದ} = 1 - \frac{3}{44}$$

$$= \frac{41}{44}$$

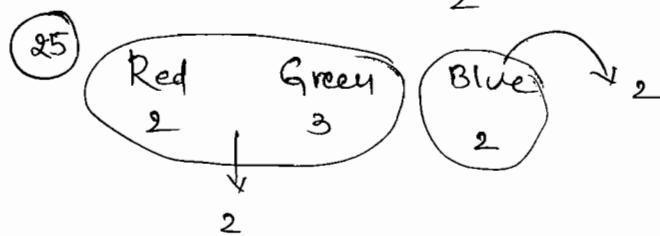


$$3 \text{ ಅನ್ಯಾಯಾಚಾರ ಸಂಖ್ಯೆ} = \frac{5C_3}{15C_3}$$

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

$$= \frac{15}{15 \times 14 \times 13}$$

$$= \frac{1}{14 \times 13}$$

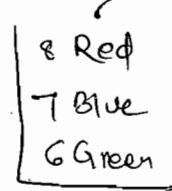


$$\text{ನೀವು ರೂಪ - ತೆಯ್ಯಾಗ} = \frac{5C_2}{7C_2}$$

$$= \frac{\frac{5 \times 4^2}{2 \times 1}}{\frac{7 \times 6^3}{2 \times 1}} = \frac{10}{21}$$

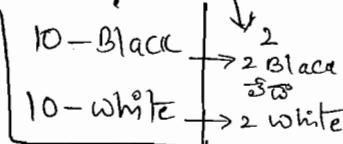


(26)



ನೀವು ರೂಪ - ತೆಯ್ಯಾಗ ಕಾರ್ಯಾಚಾರದಲ್ಲಿನಿಂದ  
ಒಳೆ ನೀವು ರೂಪ - ತೆಯ್ಯಾಗ  
 $\frac{8}{21}$  Answer.

(27)



ನೀವು ರೂಪ

$$= \frac{10C_2 + 10C_2}{20C_2}$$

$$= \frac{10 \times 9}{2 \times 1} + \frac{10 \times 9}{2 \times 1}$$

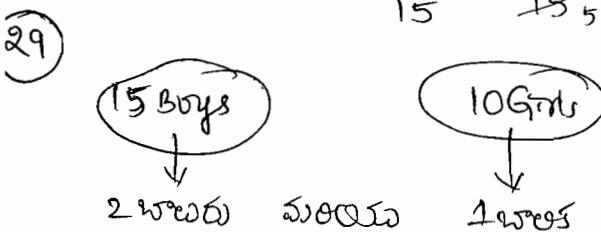
$$= \frac{20 \times 19}{2 \times 1}$$

$$= \frac{9}{19} = \frac{9}{19}$$

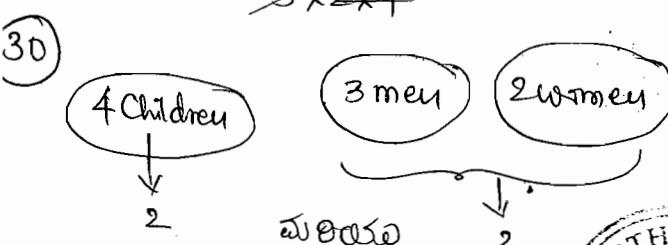
28)

$$\begin{array}{l}
 \left| \begin{array}{l} 4-R \\ 5-G \\ 6-W \end{array} \right\} = \text{ఎరువు వేసా ప్రక్రియ} \\
 = \frac{4C_1 + 5C_1}{15C_1} \\
 = \frac{4+5}{15} = \frac{1}{3} = \frac{3}{5}
 \end{array}$$

$$\begin{aligned}
 &= 4 \times 16 + \frac{4 \times 3}{2 \times 1} \\
 &\quad \frac{10 \times 19}{2 \times 1} = \frac{64+6}{10 \times 19} \\
 &= \frac{70}{190} = \frac{1}{19}
 \end{aligned}$$

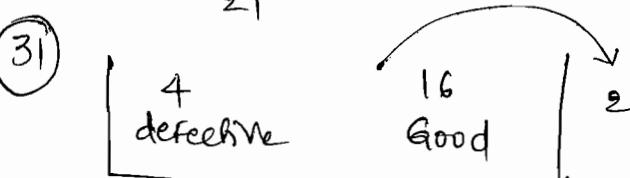


$$\begin{aligned}
 \text{సంఖ్యక్తి} &= \frac{15C_2 \times 10C_1}{25C_3} \\
 &= \frac{15 \times 14}{2 \times 1} \times \frac{10}{2 \times 1} = \frac{21}{46} \\
 &= \frac{21}{25 \times 24 \times 23} \\
 &\quad \cancel{\times 2 \times 1}
 \end{aligned}$$



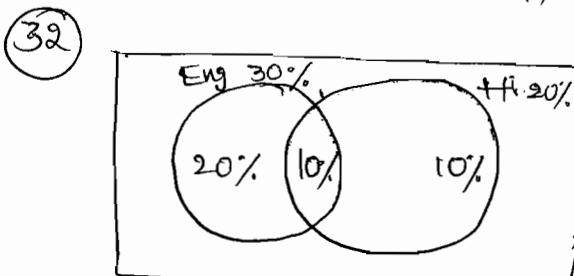
ధర్మాలోనే 2 హితులు - ద్వారా ఉంచాలి

$$\begin{aligned}
 \text{సంఖ్యక్తి} &= \frac{4C_2 \times 5C_2}{9C_4} \\
 &= \frac{4 \times 3}{2 \times 1} \times \frac{5 \times 4}{2 \times 1} \\
 &= \frac{9 \times 8 \times 7 \times 6}{4 \times 3 \times 2 \times 1} \\
 &= \frac{10}{21}
 \end{aligned}$$



రణిసం 1 defe  $\Rightarrow$  (1def & 1 Good) లేదా (2 defective)

$$\text{సంఖ్యక్తి} = \frac{(4C_1 \times 16C_1) + 4C_2}{20C_2}$$

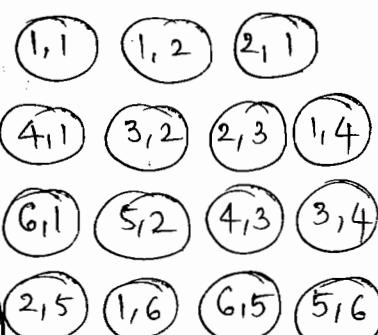


$$E \text{ తేడా } H = E \cup H$$

$$A \cup B = 20 + 10 + 10 = 40\%$$

$$\text{సంఖ్యక్తి} = \frac{40}{100} = \frac{2}{5}$$

33) మాడటివిస్ రెండో పాఠ్



అభినవాల్

2  
3  
5  
7  
11

$$\text{సంఖ్యక్తి} = \frac{15}{36} = \frac{5}{12}$$

34)

$\text{సంఖ్య} = (A \text{ గ్రహణ } B \text{ అంచు}) \text{ లేదా } (A \text{ అంచు } B \text{ గ్రహణ})$

$$P(A) = 75\% = \frac{3}{4}, P(A') = \frac{1}{4}$$

$$P(B) = 80\% = \frac{4}{5}, P(B') = \frac{1}{5}$$

$$\text{సంఖ్యక్తి} = A \times B' + A' \times B$$

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

$$= \frac{7}{20} (\frac{7}{20} \times 100)$$

$$= 35\%$$

(35)

$$H = \frac{1}{7}, H' = \frac{6}{7}$$

$$\omega = \frac{1}{5}, \omega' = \frac{4}{5}$$

$$\text{اندر} = H \times \omega + H' \times \omega'$$

$$= \frac{1}{7} \times \frac{4}{5} + \frac{6}{7} \times \frac{1}{5}$$

$$= \frac{2}{35} = \frac{2}{7}$$



# Square Roots, Cube Roots

Square Roots :-

Q)  $\sqrt{40} \mid 96$ ? అనుమతిస్తామని  
 (1)  $\frac{64}{64}$  అదా  
~~64~~

(2) 40 విధంలు వుట్టుచెందును (చూసివాల)

$$(6)^2 < 40 < (7)^2$$

(36) (49)

Q)  $\sqrt{70} \mid 56$  = ? (4 తేదా 6) తాపాగ.

$$(8^2) < 70 < (9^2)$$

(64) (81)

$$84^2 = 7056 \Rightarrow \sqrt{7056} = 84$$

Q)  $\sqrt{44} \mid 89$  = ? (కావానునట్టు 3 తేదా 9)

$$(6^2) < 44 < (7^2)$$

(36) (49)

$$(65)^2 = 4225$$

$$67^2 = 4489$$

$$\sqrt{4489} = 67$$

Q)  $\sqrt{176} \mid 89$  = ? (3 తేదా 7)

$$13^2 < 176 < 14^2$$

(169) (196)

$$\sqrt{17689} = 133$$

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

Q)  $\sqrt{18} \mid 49$  = ?

$$= 4^2 < 18 < 5^2$$

(16) (25)

$$= 45^2 = 2025$$

$$43^2 = 1849$$

$$\sqrt{1849} = 43$$

Q)  $\sqrt{32} \mid 49$  = ?

$$= 5^2 < 32 < 6^2$$

(25) (36)

$$= (57)^2 = 3249$$

$$= \sqrt{3249} = (57)^2$$

Q)  $\sqrt{1089}$  = ?

(53 తేదా 57)

$$= 55^2 = 3025$$

$$= 3^2 < 10 < 4^2$$

(9) (16)

$$= (33)^2 = 1089$$

$$= \sqrt{1089} = (33)^2$$

(33 తేదా 37)

$$= 35^2 = 1225$$



ఖచ్చిత వర్ణం లక్ష్య  
 సఫలవుగా = 1, 4, 9, 6, 5

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

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## Cube Roots

Q)  $\sqrt[3]{19683} = ?$  (3 digits తప్పగించాలి)

\* 19 అనేవి రెటోడు.

ఫలముక్కుడించుండి చెక్ చేస్తామా.

$$= 2^3 < 19 < 3^3$$

$$8 \qquad \qquad 27$$

$$= 27^3 = \frac{429}{\times 27}$$

$$\underline{19683}$$

$$= \sqrt[3]{19683} = 27^3$$



ఒకటినాని	
1	1
2	8
3	7
4	4
5	5
6	6
7	3
8	2
9	9

Q)

Q)  $\sqrt[3]{39304} =$  త 4 ఒకటినాని

Q)  $\sqrt[3]{238328} =$  6 2 ఒకటినాని

$$6^3 < 238 < 7^3$$

$$(216) \qquad (343)$$

Q)  $\sqrt[3]{24389} =$  2 9 ఒకటినాని

$$2^3 < 24 < 3^3$$

$$(8) \qquad (27)$$

$$\sqrt[3]{24389} = (29)^3$$

## Near 100, Near 1000 :

$$(1) 99^2 = (99+1)(99-1) + 1^2 = 9801$$

$$(2) 98^2 = (98+2)(98-2) + 2^2 = 9604$$

$$(3) 97^2 = 9409$$

$$(4) 999^2 = (999+1)(999-1) + 1^2 = 998001$$

$$(5) 998^2 = 996004$$

$$(6) 997^2 = 994009$$

$$\Rightarrow a^2 - b^2 = (a+b)(a-b)$$

$$\Rightarrow a^2 = (a+b)(a-b) + b^2$$

## R.S. AGGARWAL BOOK

1)  $\sqrt{53824} =$  (232 తేదా 236)

వెండువర్ణముక్కుడించీ చూస్తామా.

$$23^2 < 538 < 24^2$$

$$(529) \qquad (576)$$

$$= \sqrt{53824} = 232$$

2)  $\sqrt{64009}$

వెండువర్ణముక్కుడించి

ఒకటినాని

$$25 \qquad 3$$

$$25 \qquad 7$$

$$25^2 < 640 < 26^2$$

$$(625) \qquad (676)$$

3)  $\sqrt{10 + \sqrt{25 + \sqrt{108 + \sqrt{154 + \sqrt{225}}}}}$

$$15 + 154 = 169$$

$$= \sqrt{10 + \sqrt{25 + \sqrt{108 + \sqrt{169}}}} \quad (13 + 108) = 121$$

$$= \sqrt{10 + \sqrt{25 + \sqrt{121}}} \quad (25 + 11) = 36$$

$$= \sqrt{10 + \sqrt{36}} \quad 6 \qquad = (10 + 6) = 16$$

$$= \sqrt{16} = 4$$

### Some Imp Questions for exam

$$④ \sqrt{72 + \sqrt{72 + \sqrt{72 + \dots}}} = ?$$

= 72 లో తలా సంఖ్య =  $9 \times 8$

+ పద్ధతి సంఖ్య = 9, - సున్న సంఖ్య = 8

Answer is = 9

$$⑤ \sqrt{72 - \sqrt{72 - \sqrt{72 + \dots}}} = ?$$

Answer = 9

$$⑥ \sqrt{5 \sqrt{5 \sqrt{5 \sqrt{5 \sqrt{\dots}}}}} = ?$$

ఒకాంచ భాగములలో జరుపోవిన సంఖ్య

ఎండుండి - అది Answer

$$⑦ \sqrt{3 \sqrt{3 \sqrt{3 \sqrt{3 \sqrt{3 \dots}}}}} \text{ 10 times?}$$

$$= 3^{\frac{2^{10}-1}{2^9}}$$

$$= 3^{\frac{1024-1}{1024}}$$

$$= 3^{\frac{1023}{1024}} / 3^{\frac{1023}{1024}}$$



సహా తలా సంఖ్య అనగ వాటి రసాయ = 1 అవు

$$⑧ \sqrt{41 - \sqrt{21 + \sqrt{19 - \sqrt{9}}}} \quad [3+19=21]$$

$$= \sqrt{41 - \sqrt{21 + \sqrt{16}}} \quad [4+21=25]$$

$$= \sqrt{41 - \sqrt{25}} \quad [5+41=36]$$

$$= \sqrt{41-5}$$

$$= \sqrt{36}$$

$$= 6$$

$$⑨ = \sqrt{176 + \sqrt{24|01}} \quad 45^2 = 2025$$

$$= 4^2 < 24 < 5^2 \quad (16) \quad (25)$$

$$\frac{41}{49} \text{ అంశం}$$

$$= \sqrt{176 + \sqrt{24|01}}$$

$$49^2 = 2401$$

$$= \sqrt{176 + 49}$$

$$= \sqrt{225}$$

$$= 15$$

\*\*

$$⑩ = \sqrt{7 + 2\sqrt{12}} = ?$$

$$(\sqrt{a} + \sqrt{b})^2 = (\sqrt{a})^2 + (\sqrt{b})^2 + 2\sqrt{a} \cdot \sqrt{b}$$

$$= \sqrt{(\sqrt{4})^2 + (\sqrt{3})^2 + 2\sqrt{4} \cdot \sqrt{3}}$$

$$= \sqrt{(\sqrt{4} + \sqrt{3})^2}$$

$$= \sqrt{4} + \sqrt{3}$$

$$= 2 + \sqrt{3}$$

\*\*

$$⑪ = \frac{\sqrt{625}}{11} \times \frac{14}{\sqrt{25}} \times \frac{11}{\sqrt{196}}$$

$$= \frac{25}{11} \times \frac{14}{5} \times \frac{11}{14}$$

$$= 5$$

$$⑫ \left( \sqrt{\frac{225}{729}} - \sqrt{\frac{25}{144}} \right) \div \sqrt{\frac{16}{81}}$$

$$= \left( \frac{15}{27} - \frac{5}{12} \right) \times \frac{9}{4}$$

$$= \left( \frac{20-15}{36} \right) \times \frac{9}{4}$$

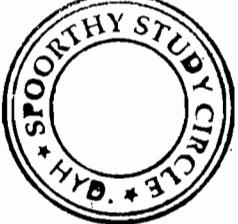
$$= \frac{5}{16}$$

$$\begin{aligned}
 8 &= \sqrt{272^2 - 128^2} \\
 a^2 - b^2 &= (a+b)(a-b) \\
 &= \sqrt{(400)(144)} \\
 &= 20 \times 12 \\
 &= 240
 \end{aligned}$$

$$\begin{aligned}
 9 &= x * y = x + y + \sqrt{xy} \\
 &= 6 * 24 = 6 + 24 + \sqrt{6 \times 24} \\
 &= 30 + \sqrt{6 \times 6 \times 2 \times 2} \\
 &= 30 + 12 \\
 &= 42
 \end{aligned}$$
  

$$\begin{aligned}
 10 &= 10y \sqrt{y^3 - y^2} \\
 &= 10y \sqrt{y^2(y-1)} \\
 &= 10y^2 \sqrt{y-1} \\
 &= 10 \times 5^2 \sqrt{5-1} \\
 &= 250 \sqrt{4} \\
 &= 500
 \end{aligned}$$

*y = 5 అనుమతి*



*(y = 5 అనుమతి ఖండా)*

$$\begin{aligned}
 13 &= \sqrt{15876} \quad \text{క్రమానుమితీ అంకి} \\
 &= 126 \quad \begin{array}{c} 12 \\ \hline 12 \end{array} \quad \begin{array}{c} 4 \\ \hline 6 \end{array} \\
 &= \sqrt{15876} = 126 \quad 12^2 < 158 < 13^2 \\
 &\quad (144) \quad (169) \\
 &\quad \begin{array}{c} 12 \\ \swarrow 13 \\ 12 \end{array} \quad 5^2 = 156.25
 \end{aligned}$$

14 ఏ రైతుత్వాన వర్గానుమితీ చరణక్రమాలు,  
1, 4, 9, 5, 6 వుంటాయి. 2, 3, 7, 8 దొండలు.

$$\begin{aligned}
 15 &= \sqrt{0.16} \\
 &= \sqrt{\frac{16}{100}} \\
 &= \frac{4}{10} \\
 &= 0.4
 \end{aligned}$$

$$\begin{aligned}
 16 &= \sqrt{0.000441} \quad (\text{రెండు సహాయ పునర్వ్యాపాలు}) \\
 &= \sqrt{\frac{441}{1000000}} \\
 &= \sqrt{\frac{21}{1000}} \\
 &= 0.021
 \end{aligned}$$

$$\begin{aligned}
 17 &= \sqrt{0.00004761} \quad \sqrt{4761} \\
 &= \sqrt{\frac{4761}{100000000}} \quad (61 \text{ తేదోశి}) \\
 &= \frac{69}{10000} \\
 &= 0.0069
 \end{aligned}$$

$6^2 < 47 < 7^2$   
 $36 \qquad \qquad \qquad 49$   
 $\nwarrow 6^2 = 4225$

$$\begin{aligned}
 18 &= 1.5^2 \times \sqrt{0.0225} \\
 &= 2.25 \times \sqrt{\frac{225}{10000}} \quad (\text{రెండు సహాయ పునర్వ్యాపాలు}) \\
 &= 2.25 \times \frac{15}{100} \\
 &= \frac{225}{1004} \times \frac{15^3}{10020}
 \end{aligned}$$

$$= \frac{27}{80}$$

$$= 0.3375$$

(19)  $= \sqrt{0.01 + \sqrt{0.0064}}$

$$= \sqrt{0.01 + 0.08}$$

$$= \sqrt{0.09} = \sqrt{\frac{9}{100}} = \frac{3}{10} = 0.3$$

$$= 0.3$$

(20)  $= \sqrt{0.01} + \sqrt{0.81} + \sqrt{1.21} + \sqrt{0.0081}$

$$= 0.1 + 0.9 + 1.1 + 0.03$$

$$= 2.13$$

(21)  $= \sqrt{0.0025} \times \sqrt{2.25} \times \sqrt{0.0001}$

$$= 0.05 \times 1.5 \times 0.01$$

$$= 0.00075$$

(22)  $= \sqrt{1.5625}$

$$= \sqrt{\frac{15625}{10000}}$$

$$= \frac{125}{100}$$

$$= 1.25$$

(23)  $\sqrt{0.00000676} = 0.0026$

$$\sqrt{6760000} = ?$$

$$= \sqrt{6760000} = \sqrt{0.00000676} \times 10^{12}$$

$$= 0.0026 \times 10^6$$

$$= 2600$$

8)  $\frac{27}{24}(3.375)$

$$\begin{array}{r} 30 \\ 24 \\ \hline 60 \\ 56 \\ \hline 40 \end{array}$$

(24)  $\sqrt{18225} = 135,$

$$\begin{aligned} &= \sqrt{182.25} + \sqrt{1.8225} + \sqrt{0.018225} + \sqrt{0.0008225} \\ &= \sqrt{\frac{18225}{10^2}} + \sqrt{\frac{18225}{10^4}} + \sqrt{\frac{18225}{10^6}} + \sqrt{\frac{18225}{10^8}} \\ &= \frac{135}{10} + \frac{135}{10^2} + \frac{135}{10^3} + \frac{135}{10^4} \\ &= 13.5 + 1.35 + 0.135 + 0.0135 \\ &= 14.9985 \end{aligned}$$

(25)  $\sqrt{13} = 3.605, \sqrt{130} = 11.40$

$$= \sqrt{1.3} + \sqrt{1300} + \sqrt{0.013} = ?$$

$$= \sqrt{\frac{130}{100}} + \sqrt{13 \times 100} + \sqrt{\frac{130}{10000}}$$

$$= \frac{11.4}{10} + 3.605 + 10 + \frac{11.4}{100}$$

$$= 1.14 + 36.05 + 0.114$$

$$= 37.304$$

(26)  $\frac{52}{x} = \sqrt{\frac{169}{289}}$

$$\frac{52}{x} \cancel{\times} \frac{13}{17}$$

$$x = 68$$

(27)  $= \left(\frac{*}{15}\right) \left(\frac{*}{135}\right) = 1$

$$= *^2 = 15 \times 135$$

$$*^2 = 15 \times 15 \times 3 \times 3$$

$$* = 15 \times 3$$

$$* = 45$$

(28)  $= \frac{4\frac{1}{2}}{?} \cancel{\times} \frac{?}{32}$

$$= ?^2 = \frac{9}{2} \times \frac{16}{32}$$

$$?^2 = 9 \times 16$$

$$? = 3 \times 4$$

$$? = 12$$

$$\textcircled{29} \quad \frac{?}{\sqrt{128}} \times \frac{\sqrt{162}}{?}$$

$$x^2 = \sqrt{128} \times \sqrt{162}$$

$$x^2 = \sqrt{(64) \times 2 \times 81 \times 2}$$

$$x = 8 \times 2 \times 9$$

$$x = 144$$

$$\textcircled{30} \quad \frac{0.13}{P^2} = 13$$

$$= P^2 = \frac{13}{100 \times 13}$$

$$P^2 = \frac{1}{100}$$

$$P = \frac{1}{10} = 0.1$$

$\textcircled{31}$  వినిష్ట్రో  $\sqrt{0.25}$  చేయిస్తే ఫలితం  $0.25$  కావాలి.

$$\frac{x}{\sqrt{0.25}} = 25$$

$$x = 25 \times \sqrt{0.25}$$

$$x = 25 \times 0.5$$

$$x = 12.5$$

$$\textcircled{32} \quad \sqrt{3^n} = 729$$

$$(3^n)^{\frac{1}{2}} = (27)^2$$

$$3^{\frac{n}{2}} = 3^6$$

$$\frac{n}{2} = 6$$

$$n = 12$$

$$\textcircled{33} \quad \sqrt{18 \times 14 \times x} = 84$$

$$\textcircled{33} \quad \begin{matrix} \text{S.O.B} \\ 18 \times 14 \times x = \frac{6}{84} \times \frac{28}{84} \end{matrix}$$

$$x = 28$$

$\textcircled{34}$

$$28\sqrt{x} + 1426 = \frac{3}{4} \times 2872$$

$$14\sqrt{x} + 713 = \overbrace{3 \times 359}$$

$$14\sqrt{x} = 1077 - 713$$

$$\cancel{14\sqrt{x}} = \frac{52}{364} \cancel{26}$$

$$\sqrt{x} = 26 \Rightarrow x = 26 \times 26$$

$$x = 676$$

$\textcircled{35}$

$$\sqrt{\frac{x}{169}} = \frac{54}{39}$$

$$\frac{\sqrt{x}}{13} = \frac{18}{54}$$

$$\sqrt{x} = 18 \Rightarrow x = 18 \times 18$$

$$x = 324$$

$\textcircled{36}$

$$\sqrt{x} \div \sqrt{441} = 0.02$$

$$\frac{\sqrt{x}}{21} = 0.02$$

$$\sqrt{x} = 0.42$$

$$x = .1764$$

$\textcircled{37}$

$$\sqrt{\frac{0.0196}{x}} = 0.2$$

$$= \frac{0.14}{\sqrt{x}} = 0.2$$

$$- \sqrt{x} = \frac{0.14}{0.2}$$

$$\sqrt{x} = 0.7 \Rightarrow x = 0.7 \times 0.7$$

$$x = 0.49$$



$$38) \sqrt{0.0169 \times x} = 1.3$$

$$0.13 \times \sqrt{x} = 1.3$$

$$\sqrt{x} = \frac{1.3}{0.13}$$

$$\sqrt{x} = 10 \Rightarrow x = 10 \times 10$$

$$x = 100$$

$$39) \sqrt{13.69} + \sqrt{0.0615+x} = 37.25$$

$$= 3^2 < 13 < 4^2$$

(9) (16)

$\begin{array}{r} 3 \\ 3 \\ \hline 1 \end{array}$  തെവ്

$$= 3^2 = 1225 \text{ (3 തരംഗം } 0.4 \text{ ലീപ്പോലി)$$

$$= 37 + \sqrt{0.0615+x} = 37.25$$

$$= \sqrt{0.0615+x} = 0.25$$

(Square On Both sides)

$$= 0.0615+x = 0.0625$$

$$x = 0.001$$

$$x = 10^{-3}$$

$$40) \sqrt{(x-1)(y+2)} = 7$$

(Square On Both sides)

$$(x-1)(y+2) = 7^2$$

$$\begin{array}{c|c} x-1 = 7 & y+2 = 7 \\ \downarrow & \downarrow \\ x = 8 & y = 5 \end{array}$$

$$x = 8, y = 5$$

$$41) \sqrt{0.04 \times 0.4 \times a} = 0.004 \times 0.4 \times \sqrt{b}$$

$$= \frac{4}{100} \times \frac{4}{10} \times a = \frac{16}{1000000} \times \frac{16}{100} \times b$$

$$\frac{a}{b} = \frac{16}{1000000}$$

$$\frac{a}{b} = 0.00016$$

$$42) \sqrt{0.00016} = x$$

$$\begin{array}{c} 3 \\ 5 \\ \hline x^2 = \frac{42.05}{126.15} \end{array}$$

$$x^2 = 5 \times 42.05$$

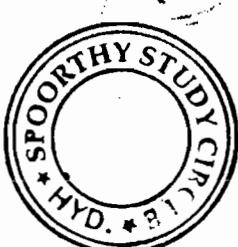
$$x^2 = \frac{5 \times 5 \times 841}{100}$$

$$x = \frac{5 \times 29}{102}$$

$$x = 14.5$$

43)

$$\sqrt{\frac{0.361}{0.00169}} = \sqrt{\frac{361}{10000}} = \frac{19 \times 10}{13} = \frac{190}{13}$$



44)

$$\sqrt{\frac{48.4}{0.289}} = \sqrt{\frac{484}{289}/100} = \frac{22 \times 10}{17}$$

45)

$$\sqrt{1+\frac{x}{169}} = \frac{14}{13}$$

Squaring On Both Sides.

$$1 + \frac{x}{169} = \frac{196}{169}$$

$$14 \frac{x}{169} = 14 \frac{27}{169}$$

$$x = 27$$

$$\frac{a}{b} = \frac{16}{100000}$$

$$\frac{a}{b} = 0.00016$$

$$(46) \quad = \sqrt{1 + \frac{55}{729}} = 1 + \frac{x}{27}$$

$$= \sqrt{\frac{784}{729}} = 1 + \frac{x}{27}$$

$$\frac{28}{27} = 1 + \frac{x}{27}$$

$$++\frac{1}{27} = ++\frac{x}{27}$$

$$x = 1$$

$$(47) \quad \sqrt{2} = 1.414, \sqrt{3} = 1.732$$

$$(48) \quad = 2\sqrt{27} - \sqrt{75} + \sqrt{12}$$

$$= 2\sqrt{9 \times 3} - \sqrt{25 \times 3} + \sqrt{4 \times 3}$$

$$= 6\sqrt{3} - 5\sqrt{3} + 2\sqrt{3}$$

$$= 3\sqrt{3}$$

$$(49) \quad (\sqrt{12} + \sqrt{18}) - (\sqrt{3} + \sqrt{2})$$

$$= 2\sqrt{3} + 3\sqrt{2} - \sqrt{3} - \sqrt{2}$$

$$= \sqrt{3} + 2\sqrt{2}$$

$$(50) \quad = \frac{\sqrt{24} + \sqrt{216}}{\sqrt{96}}$$

$$= \frac{\sqrt{4 \times 6} + \sqrt{6 \times 6 \times 6}}{\sqrt{16 \times 6}}$$

$$= \frac{2\sqrt{6} + 6\sqrt{6}}{4\sqrt{6}}$$

$$= \frac{8}{4} = 2$$

$$(51) \quad = \frac{\sqrt{80} - \sqrt{112}}{\sqrt{45} - \sqrt{63}}$$

$$= \frac{\sqrt{16 \times 5} - \sqrt{16 \times 7}}{\sqrt{9 \times 5} - \sqrt{9 \times 7}}$$

$$= \frac{4\sqrt{5} - 4\sqrt{7}}{3\sqrt{5} - 3\sqrt{7}}$$

$$= \frac{4}{3} = 1\frac{1}{3}$$

$$(52) \quad 3\sqrt{5} + \sqrt{125} = 17.88$$

$$3\sqrt{5} + 5\sqrt{5} = 17.88 \quad \left| \begin{array}{l} \sqrt{80} + 6\sqrt{5} = ? \\ = \sqrt{16 \times 5} + 6\sqrt{5} \\ = 4\sqrt{5} + 6\sqrt{5} \\ = 10\sqrt{5} \end{array} \right.$$

$$8\sqrt{5} \rightarrow 17.88$$

$$10\sqrt{5} \rightarrow ? = \frac{2.235}{8\sqrt{5}} = \frac{17.88 \times 10\sqrt{5}}{8\sqrt{5}} = 22.35$$

$$(53) \quad = \sqrt{150} \times \sqrt{98} \quad (\sqrt{a} \times \sqrt{b} = \sqrt{ab})$$

$$= \sqrt{150 \times 98}$$

$$= \sqrt{25 \times 2 \times 49 \times 2}$$

$$= 5 \times 2 \times 7$$

$$= 70$$

$$(54) \quad = \sqrt{8} + 2\sqrt{32} - 3\sqrt{128} + 4\sqrt{50}$$

$$= \sqrt{4 \times 2} + 2\sqrt{16 \times 2} - 3\sqrt{64 \times 2} + 4\sqrt{25 \times 2}$$

$$= 2\sqrt{2} + 8\sqrt{2} - 24\sqrt{2} + 20\sqrt{2}$$

$$= 6\sqrt{2}$$

$$= 6(1.414) \Rightarrow 8.484$$

$$(55) \quad = \frac{3\sqrt{12}}{2\sqrt{28}} \div \frac{2\sqrt{21}}{\sqrt{98}}$$

$$= \frac{3\sqrt{4 \times 3}}{2\sqrt{4 \times 7}} \quad \text{(X)} \quad \frac{\sqrt{49 \times 2}}{2\sqrt{7 \times 3}}$$

Divided by తీట  
వండులు x శుర్క  
పెట్టినప్పుడు.

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

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

$$= \frac{3}{4} (0.3535)$$

$$= 1.0605$$

$$56) = \sqrt{\frac{0.081 \times 4.484}{0.0064 \times 6.25}}$$

ප්‍රවාන same decimal  
ක්‍රියා same decimal  
ව්‍යුත්තාන ප්‍රත්‍යාග්‍ය  
ක්‍රියාවලා.

$$= \sqrt{\frac{81 \times 484}{64 \times 625}}$$

$$= \frac{9 \times 22}{48 \times 25} = \frac{99}{100} = 0.99$$

$$57) = \sqrt{\frac{0.204 \times 42}{0.07 \times 3.4}}$$

$$= \sqrt{\frac{204 \times 42}{7 \times 34}} = \sqrt{6 \times 6} = \sqrt{36}$$

$$= 6$$

$$58) = \sqrt{\frac{0.081 \times 0.324 \times 4.624}{1.5625 \times 0.0289 \times 72.9 \times 64}}$$

$$= \sqrt{\frac{81 \times 324 \times 4624}{15625 \times 289 \times 729 \times 64}}$$

$$= \frac{9 \times 18 \times 684}{125 \times 17 \times 27 \times 8}$$

$$= \frac{3}{125} \times \frac{8}{8} \left\{ \text{ස්‍යාන්} \right\}$$

$$= \frac{24}{1000}$$

$$= 0.024$$

$$59) = \sqrt{\frac{9.5 \times 0.085}{0.0017 \times 0.19}} / 10000$$

$$= \sqrt{\frac{95 \times 85 \times 100}{17 \times 19}}$$

$$= 5 \times 10$$

$$= 50$$

$$60) = \sqrt{\frac{(0.03)^2 + (0.21)^2 + (0.065)^2}{(0.003)^2 + (0.021)^2 + (0.0065)^2}}$$

$$= \sqrt{\frac{(0.03)^2 + \dots}{(\frac{0.03}{10})^2 + \dots}}$$

$$= \sqrt{10^{-4}}$$

$$= 10$$

$$61) = \sqrt{(1+3\sqrt{5})(7-3\sqrt{5})}$$



$$\sqrt{7^2 - (3\sqrt{5})^2}$$

$$\sqrt{49 - 45}$$

$$= \sqrt{4}$$

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

$$62) = \left( \sqrt{3} - \frac{1}{\sqrt{3}} \right)^2$$

$$= (\sqrt{3})^2 + \left( \frac{1}{\sqrt{3}} \right)^2 - 2 \cdot \sqrt{3} \cdot \frac{1}{\sqrt{3}}$$

$$= 3 + \frac{1}{3} - 2$$

$$= 1 + \frac{1}{3}$$

$$= \frac{4}{3}$$

$$63) = \left( \sqrt{2} + \frac{1}{\sqrt{2}} \right)^2$$

$$= (\sqrt{2})^2 + \left( \frac{1}{\sqrt{2}} \right)^2 + 2 \cdot \sqrt{2} \cdot \frac{1}{\sqrt{2}}$$

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

$$= 4 \frac{1}{2}$$

$$64) \quad a = 0.1039$$

$$= \sqrt{4a^2 - 4a + 1} + 3a$$

$$= \sqrt{(2a)^2 - 2 \times (2a) \times 1 + 1^2} + 3a$$

$$= \sqrt{(1-2a)^2} + 3a$$

$$= 1-2a+3a$$

$$= 1+a$$

$$= 1+0.1039$$

$$= 1.1039$$

$$65) \quad \frac{0.75^3}{1-0.75} + (0.75 + 0.75^2 + 1)$$

$$a=1, b=0.75 \text{ என்கின்று.}$$

$$= \frac{b^3}{a-b} + (axb + b^2 + a^2)$$

$$= \frac{b^3 + (a-b)(a^2 + ab + b^2)}{a-b}$$

$$= \frac{b^3 + a^3 - b^3}{a-b} \quad \boxed{a^3 - b^3 = (a-b)(a^2 + ab + b^2)}$$

$$= \frac{a^3}{a-b} = \frac{1}{1-0.75} = \frac{1}{0.25}$$

$$= \sqrt{\frac{1}{0.25}} = \sqrt{4} = 2$$

66)

$$3a = 4b = 6c \quad | \quad a+b+c = 27\sqrt{29} \quad | \quad \sqrt{a^2 + b^2 + c^2} = ?$$

$$\text{செலவு} = \boxed{3, 4, 6} = 12$$

$$= \frac{8a}{12_4} = \frac{4b}{12_3} = \frac{6c}{12_2}$$

$$= \frac{a}{4} = \frac{b}{3} = \frac{c}{2}$$

$$a:b:c = (4:3:2) \times 3 \text{ சீர்யாக} \\ \text{sum} = 9 \text{ என்றால் } 27 \text{ வால்.}$$

$$a,b,c = 12:9:6$$

$$a,b,c = 12\sqrt{29}, 9\sqrt{29}, 6\sqrt{29}$$

$$= \sqrt{a^2 + b^2 + c^2} = ?$$

$$= \sqrt{12^2 \times 29 + 9^2 \times 29 * 6^2 \times 29}$$

$$= \sqrt{261 \times 29}$$

$$= \sqrt{29 \times 9} \times 29$$

$$= 29 \times 3$$

$$= 87$$

Decimal தொகை Repeated words வாய்ப் பாதி  
என்றால் என்றால் என்றால்.

Rational No.

$$\text{தொகையைப் } \frac{p}{q}$$

Irrational No.

என்றால்

$$① \sqrt{2}, \sqrt{3} \quad \boxed{X}$$

✓

$$② \pi = \frac{22}{7} \quad \boxed{X} \\ (3.142857142857)$$

✓ Repeated values

$$67) \quad = \sqrt{0.\overline{4}}$$

$$= \sqrt{\frac{4}{9}}$$

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

$$= 0.6666\dots$$

$$= 0.\overline{6}$$

⑧  $\sqrt{2}$  என்றால்?

$$\begin{array}{r} 4 \\ \sqrt{20000} \\ -1 \\ \hline 100 \\ -96 \\ \hline 400 \\ -281 \\ \hline 11900 \\ -11396 \\ \hline 1 \end{array} \quad 1.414$$

68) తొండుకల్లి వీటివర్ధమాలం అంగాలు నేళ్లు?

- (a) 0.4 (b) 0.09 (c) 0.9 (d) 0.025

$$\sqrt{\frac{4}{10}} = \sqrt{\frac{9}{100}} \quad \sqrt{\frac{9}{10}} \quad \sqrt{\frac{25}{1000}}$$

69)  $\sqrt{0.4} = ?$

6	0.400000	0.632
+6	36	
<u>123</u>	<u>400</u>	
+3	369	
<u>1262</u>	<u>3100</u>	
	2524	

70)  $\sqrt{0.121} = ?$

3	0.121000	0.34
3	9	
<u>64</u>	<u>310</u>	
	256	

71)  $\sqrt{0.064} = ?$

2	0.06400000	0.25
+2	4	
<u>45</u>	<u>240</u>	
	225	

72)  $\sqrt{\frac{0.1604}{0.4}} - \sqrt{0.4} = 0.63$

$$\begin{aligned} \frac{1 + \sqrt{0.01}}{1 - \sqrt{0.1}} &= \frac{1 + \sqrt{\frac{1}{100}}}{1 - \sqrt{0.1}} \\ &= \frac{1 + 0.1}{1 - 0.31} \end{aligned}$$

$$\begin{array}{r} 3 \\ +3 \\ \hline 61 \\ \hline 0.10\overline{00000} \\ -9 \\ \hline 100 \\ \hline \end{array} \quad 0.31$$

$$= \frac{1.1}{0.69} = \frac{110}{69}$$

74)  $\sqrt{5} = 2.236 = \frac{1}{\sqrt{5}} = ?$

$$= \frac{1}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5} = \frac{2.236}{5} = 0.4472$$

$$= 0.4472 \quad \cancel{= 0.4472}$$

75)  $\sqrt{24} = 4.899 = \sqrt{\frac{8}{3}}$

$$= \sqrt{\frac{8}{3} \times \frac{3}{3}} = \frac{\sqrt{24}}{3} = \frac{4.899}{3} = 1.633.$$



76)  $\sqrt{6} = 2.449 = \frac{\sqrt{2}}{2\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$

$$= \frac{\sqrt{6}}{2} = \frac{2.449}{2} = 1.2245$$

77)  $= \frac{\sqrt{5}}{2} - \frac{10}{\sqrt{5}} + \sqrt{125}$

$$= \frac{5 - 20 + 2\sqrt{5} \times 5\sqrt{5}}{2\sqrt{5}}$$

$$= \frac{735}{2\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$$

$$= \frac{7}{2}\sqrt{5}$$

$$= \frac{7}{2} (2.236)$$

$$= 7.826$$

(18)

$$2 * 3 = \sqrt{13} = \sqrt{a^2 + b^2} = \sqrt{2^2 + 3^2}$$

$$3 * 4 = 5 = \sqrt{a^2 + b^2} = \sqrt{3^2 + 4^2}$$

$$5 * 12 = \sqrt{a^2 + b^2} = \sqrt{5^2 + 12^2} = 13$$

(79) 3, 4, 5, 6, 8

- (a) 900 (b) 1200 (c) 2500 (d) 3600

Check divisibility Rule.

భాగీయతాసూత్రికు చెక్ చేయండి.

(80)

$$\begin{array}{c} 21, 36, 66 \\ \swarrow \quad \swarrow \quad \swarrow \\ 3 \quad 7 \quad 9 \quad 4 \quad 11 \end{array} \quad (\text{A})$$

(A) 21344

$$9 - 9 = 0 \quad 4 \text{ अं } \\ 11 \text{ अं } \checkmark$$

(B) 21434

$$10 - 8 = 2 \\ 11 \text{ अं } \times$$

(C) 21434

$$9 - 9 = 0$$

11  $\checkmark$   
అన్నాటాడు

(D) 231444

$$11 - 7 = 4 \\ 11 \text{ अं } \times$$

(81)

$$\begin{array}{r} 2 | 294 \\ \quad 147 \\ \quad \quad 21 \\ \quad \quad \quad 3 \end{array}$$

$$294 = 2 \times 1 \times 7 \times 3 \times (2 \times 3) \quad 6 \text{ अंगसीంగలు}$$

(82)

$$\begin{array}{r} 2 | 5808 \\ \quad 2904 \\ \quad \quad 1452 \\ \quad \quad \quad 726 \\ \quad \quad \quad \quad 363 \\ \quad \quad \quad \quad \quad 121 \end{array}$$

$$5808 = 4 \times 4 \times 3 \times (11 \times 11) \times 3$$

3 అంగసీంగలు.

(83)

$$\begin{array}{r} 7 | 1470 \\ \quad 210 \\ \quad \quad 30 \\ \quad \quad \quad 15 \\ \quad \quad \quad \quad 3 \\ \quad \quad \quad \quad \quad 5 \end{array}$$

$$1470 = 7 \times 7 \times (2 \times 3 \times 5)$$

$$2 \times 3 \times 5 = 30 \text{ అంగసీంగలు.}$$

(84)

549162 ఏనొఫ్ఫ్సు తీసుకోస్తు...

- (a) 28 (b) 36 (c) 62 (d) 81

$$\begin{array}{r} 7 | 549162 \\ \quad 49 \\ \hline 144 \\ \quad \quad 4 \\ \hline 148 \\ \quad \quad 1 \\ \hline 148 \\ \quad \quad 1 \\ \hline 81 \end{array} \quad 741$$

తీసుకోస్తు

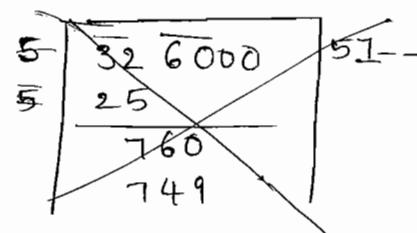
= 81 ఒక ప్రెఫెక్చర్ స్క్వార్ అవుతుంది.

=  $742^2$  ను కణించే ప్రెఫెక్చర్ స్క్వార్ అవుతుంది.

(85)

= 0.000326 మళ్ళీప్రెఫ్చర్ స్క్వార్ అవుతుంది!

$$= \frac{326}{1000000}$$



$$\begin{array}{r} 1 | 326 \\ \quad -1 \\ \hline 28 \\ \quad 226 \\ \quad \quad 224 \\ \quad \quad \quad 2 \\ \hline \end{array} \quad 18$$

$$= \frac{2}{1000000} \quad \text{తీసుకోస్తు.}$$

86

$$\begin{array}{r}
 8 \\
 + 8 \\
 \hline
 16 2 \\
 + 2 \\
 \hline
 16 4
 \end{array}
 \left| \begin{array}{r}
 680621 \\
 64 \\
 \hline
 406 \\
 324 \\
 \hline
 8221 \\
 6576 \\
 \hline
 1645
 \end{array} \right. \xrightarrow{\text{తేస్వేణు}} 824$$

$$= 680625$$

$$\begin{array}{r}
 680621 \\
 \hline
 4 \rightarrow \text{మొత్తం } (825^2)
 \end{array}$$

87

$$4\text{-అండల రూప్యానుభూట్} = 9999$$

$$\begin{array}{r}
 9 \\
 + 9 \\
 \hline
 18 9
 \end{array}
 \left| \begin{array}{r}
 9999 \\
 81 \\
 \hline
 1899 \\
 1701 \\
 \hline
 198
 \end{array} \right. \xrightarrow{\text{తేస్వేణు}} 99$$

$$\begin{array}{r}
 9999 \\
 - 198 \\
 \hline
 9801
 \end{array}$$

88

$$4\text{-అండల రూప్యానుభూట్} = 1000$$

$$\begin{array}{r}
 3 \\
 + 3 \\
 \hline
 6 1
 \end{array}
 \left| \begin{array}{r}
 1000 \\
 9 \\
 \hline
 100 \\
 61 \\
 \hline
 39
 \end{array} \right. \xrightarrow{\text{తేస్వేణు}} 31^2$$

$1000 - 39 = 961$

$$31 \text{ next Number} = 32^2 = 1024$$

$$(89) = \frac{1}{\sqrt{5}-\sqrt{3}} \text{ అండలియానెయగ్}$$

$$= \frac{1}{\sqrt{5}-\sqrt{3}} \times \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}+\sqrt{3}}$$

$$= \frac{\sqrt{5}+\sqrt{3}}{2}$$

$$= \frac{2 \cdot 2.2361 + 1 \cdot 7321}{2}$$

$$= \frac{3 \cdot 9682}{2} = 1.9841$$

90

$$\frac{1}{\sqrt{9}-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-\sqrt{4}}$$

... అండలియానెయగ్ - త్రటీ term's

$$\frac{1}{\sqrt{9}-\sqrt{8}} \times \frac{\sqrt{9}+\sqrt{8}}{\sqrt{9}+\sqrt{8}} = 11$$

$$= (\sqrt{9} + \sqrt{8}) - (\sqrt{8} + \sqrt{7}) + (\sqrt{7} + \sqrt{6}) - (\sqrt{6} + \sqrt{5}) + (\sqrt{5} + \sqrt{4})$$

$$= \sqrt{9} + \sqrt{4}$$

$$= 3+2$$

$$= 5$$

91

$$92) \sqrt{2} = 1.4142$$

$$= \frac{7}{3+\sqrt{2}} \times \frac{3-\sqrt{2}}{3-\sqrt{2}} \\ a+b \qquad a-b$$

$$= \frac{7(3-\sqrt{2})}{9-2}$$

$$= 3-\sqrt{2}$$

$$= 1.5858$$

$$93) \frac{3\sqrt{2}}{\sqrt{6}-\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}} - \frac{6}{\sqrt{8}-\sqrt{12}}$$

$$(\text{USSR மத்திய}) - \frac{6^3}{2\sqrt{2}-2\sqrt{3}}$$

$$= \frac{3\sqrt{2}}{\sqrt{6}-\sqrt{3}} \times \frac{(\sqrt{6}+\sqrt{3})}{\sqrt{6}+\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}} \times \frac{(\sqrt{6}+\sqrt{2})}{\sqrt{6}+\sqrt{2}} + \\ \frac{3}{\sqrt{3}-\sqrt{2}} \times \frac{(\sqrt{3}+\sqrt{2})}{\sqrt{3}+\sqrt{2}}$$

$$= \sqrt{12} + \sqrt{6} - \sqrt{18} - \sqrt{6} + 3\sqrt{3} + 3\sqrt{2}$$

$$= (2\cancel{\sqrt{3}}) + \cancel{\sqrt{6}} - 3\sqrt{2} - \cancel{\sqrt{6}} + (3\cancel{\sqrt{3}}) + 3\sqrt{2}$$

$$= 5\sqrt{3}$$

$$94) \frac{\sqrt{7}+\sqrt{5}}{\sqrt{7}-\sqrt{5}} \times \frac{\sqrt{7}+\sqrt{5}}{\sqrt{7}+\sqrt{5}} \\ (a-b) \qquad (a+b)$$

$$= \frac{(\sqrt{7}+\sqrt{5})^2}{\sqrt{7}^2-\sqrt{5}^2}$$

$$= \frac{7+5+2\sqrt{35}}{2}$$

$$= \frac{12+2\sqrt{35}}{2}$$

$$= 6+\sqrt{35}$$

$$95) \frac{5+2\sqrt{3}}{7+4\sqrt{3}} = a+b\sqrt{3}$$

இங்கீரும் என்றெண்

$$= \frac{5+2\sqrt{3}}{7+4\sqrt{3}} \times \frac{(7-4\sqrt{3})}{(7-4\sqrt{3})} = \text{|| do ||} \\ (a+b) \qquad (a-b)$$

$$= \frac{35+14\sqrt{3}-20\sqrt{3}-8\times 3}{49-48} = \text{||}$$

$$= 11-6\sqrt{3} = a+b\sqrt{3}$$

$$= a=11, b=-6$$

$$96) \sqrt{2} = 1.414$$

$$= \sqrt{\frac{\sqrt{2}-1}{\sqrt{2}+1}}$$

$$= \sqrt{\frac{(\sqrt{2}-1)}{(\sqrt{2}+1)} \times \frac{(\sqrt{2}-1)}{\sqrt{2}-1}} \\ (a+b) \qquad (a-b)$$

$$= \sqrt{(\sqrt{2}-1)^2}$$

$$= \sqrt{2}-1$$

$$= 1.414 - 1$$

$$= 0.414$$

$$97) = \frac{3+\sqrt{6}}{5\sqrt{3}-2\sqrt{2}-\sqrt{32}+\sqrt{50}}$$

$$= \frac{3+\sqrt{6}}{5\sqrt{3}-4\sqrt{3}-4\sqrt{2}+5\sqrt{2}}$$

$$= \frac{3+\sqrt{6}}{\sqrt{3}+\sqrt{2}} \times \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}} \\ (a+b) \qquad (a-b)$$

$$= 3\sqrt{3} + \sqrt{18} - 3\sqrt{2} - \sqrt{12}$$

$$= 3\sqrt{3} + 3\cancel{\sqrt{2}} - 3\cancel{\sqrt{2}} - 2\sqrt{3}$$

$$= \sqrt{3}$$





(104)  $\text{Group} = x \text{ Members}$

$\text{Member} = x \text{ Paise}$

$\text{Paise} = x \times x = x^2$

$x^2 = 59.29 \text{ RS} (x \times 100)$

$x^2 = 59.29 \text{ Paise}$

$$x = \sqrt{59.29}$$

$x = 77$

$$\begin{array}{c} 7^2 < 59 < 8^2 \\ (49) \qquad \qquad (64) \\ 7 \frac{3}{7} \text{ तीक्ष्ण} \\ 7 \cdot 7 \end{array}$$

(105)

$$= \sqrt[3]{0.000216}$$

$$= \sqrt[3]{\frac{216}{1000000}}$$

$$= \sqrt[3]{\frac{6^3}{100^3}}$$

$$= \frac{6}{100} \Rightarrow 0.06$$



(106)  $= \sqrt[3]{4 \frac{12}{125}} \Rightarrow \sqrt[3]{\frac{512}{125}}$

$$= \sqrt[3]{\frac{8^3}{5^3}} \Rightarrow \frac{8}{5} = 1 \frac{3}{5}$$

(107)

$$= \sqrt[3]{\sqrt{0.000064}}$$

$$= \sqrt[3]{\sqrt{\frac{64}{1000000}}}$$

$$= \sqrt[3]{\frac{8}{1000}}$$

$$= \sqrt[3]{\frac{2^3}{10^3}} = \frac{2}{10} \Rightarrow 0.2$$

(108)

4 अवृत्त गोप्य संख्या?

- (a) 8000 (b) 9261 (c) 9999 (d) None

$$= \sqrt[3]{9261}$$

$$= (21)^3$$

= 21

(109)

$$\begin{array}{r} 5 | 675 \\ 5 | 135 \\ 3 | 27 \\ 3 | 9 \\ \hline 3 \end{array}$$

— ದಿನಾಂಕ ರೂಪ.

$$675 = (5 \times 5) \times (3 \times 3 \times 3) \times 5 \quad \text{— ಸರ್ವಾರ್ಥ.}$$

(110)

3600  $\rightarrow$  Cube ಗ್ರಾಹಂ ದಿನಾಂಕ ಫೋರ್ಮಾಟ್.

$$\begin{array}{r} 3 | 3600 \\ 3 | 1200 \\ 2 | 400 \\ 2 | 200 \\ 2 | 100 \\ 2 | 50 \\ 5 | 25 \\ \hline 5 \end{array}$$

$$3600 = 3 \times 3 \times 2 \times 2 \times 2 \times 5 \times 5$$

$$= 3 \times 3 \times 2 \times 5 \times 5 \quad \text{— ಸರ್ವಾರ್ಥ.}$$

$$= 450$$

$$2^3 < 9 < 3^3$$

$$(8) \qquad (27)$$

# SURDS & INDICES

క్రమాల అధ్యాతోసు

$$\textcircled{4} \quad a^m = b \quad a = b^{\frac{1}{m}}$$

$$\boxed{x = \sqrt[n]{a} \\ x = a^{\frac{1}{n}}}$$

$$\textcircled{5} \quad \frac{1}{a^n} = a^{-n}$$

$$\textcircled{6} \quad \frac{a^m}{a^n} = a^{m-n}$$

$$\textcircled{7} \quad a^m \cdot a^n = a^{m+n}$$

$$\textcircled{8} \quad (a^m)^n = a^{mn}$$



R.S. Aggarwal Book

$$1) (256)^{\frac{5}{4}} \Rightarrow (16^2)^{\frac{5}{4}} \Rightarrow ((4^2)^2)^{\frac{5}{4}}$$

$$\Rightarrow (4^4)^{\frac{5}{4}} \Rightarrow 4^{\frac{4 \times 5}{4}} \Rightarrow 4^5$$

$$\Rightarrow (2^2)^5 \Rightarrow 2^{10} \Rightarrow 1024$$

$$2) (\sqrt{8})^{\frac{1}{3}} = ((8)^{\frac{1}{2}})^{\frac{1}{3}} \Rightarrow ((2^3)^{\frac{1}{2}})^{\frac{1}{3}}$$

$$\Rightarrow 2^{\frac{3 \times \frac{1}{2} \times \frac{1}{3}}{2}} \Rightarrow 2^{\frac{1}{2}} \Rightarrow \sqrt{2}$$

$$3) \left(\frac{32}{243}\right)^{-\frac{4}{5}} \Rightarrow \left(\frac{243}{32}\right)^{\frac{4}{5}}$$

-ను తీవ్రమంగా భిన్నాన్ని Reverse చేశామ.

$$\Rightarrow \left(\frac{3^5}{2^5}\right)^{\frac{4}{5}} \Rightarrow \left(\frac{3}{2}\right)^4 \Rightarrow \frac{81}{16}$$

$$4) \left(-\frac{1}{216}\right)^{-\frac{2}{3}} \Rightarrow (-216)^{\frac{2}{3}}$$

$$\Rightarrow (-6^3)^{\frac{2}{3}} \Rightarrow (-6)^2 \Rightarrow 36$$

$$\textcircled{5} \quad = 5^{\frac{1}{4}} \times 125^{0.25} \\ = 5^{0.25} \times 5^{0.75} \\ = 5^{0.25+0.75} \\ = 5^1$$

$$\textcircled{6} \quad = \frac{1}{(216)^{-\frac{2}{3}}} + \frac{1}{(256)^{-\frac{3}{4}}} + \frac{1}{(32)^{-\frac{1}{5}}} \\ = (216)^{\frac{2}{3}} + (256)^{\frac{3}{4}} + (32)^{\frac{1}{5}} \\ = (6^3)^{\frac{2}{3}} + (4^4)^{\frac{3}{4}} + (2^5)^{\frac{1}{5}} \\ = 36 + 64 + 2 \\ = 102$$

$$\textcircled{7} \quad \frac{10^{150}}{10^{146}} \Rightarrow 10^{150-146} \\ \Rightarrow 10^4 \Rightarrow 10000$$

$$\textcircled{8} \quad \frac{2 \cdot 4 \times 10^3}{8 \times 10^{-2}} \Rightarrow \frac{\cancel{2} \cdot \cancel{4} \times 10^2}{\cancel{8} \times \cancel{10}^{-2}} \Rightarrow 3 \times 10^4$$

$$\textcircled{9} \quad \left(\frac{1}{216}\right)^{-\frac{2}{3}} \div \left(\frac{1}{27}\right)^{-\frac{4}{3}} \\ = (216)^{\frac{2}{3}} \div (27)^{\frac{4}{3}} \\ = \frac{(6^3)^{\frac{2}{3}}}{(3^3)^{4/3}} \Rightarrow \frac{\cancel{36}}{\cancel{81}} = \frac{4}{9}$$

$$\textcircled{10} \quad \frac{1000^7}{10^{18}} = \frac{(10^3)^7}{10^{18}} \\ \Rightarrow 10^{21-18} \\ \Rightarrow 10^3 \\ \Rightarrow 1000$$

$$\begin{aligned}
 11) &= (256)^{0.16+0.09} \\
 &= (256)^{0.25} \\
 &= (256)^{\frac{1}{4}} \Rightarrow \left(\frac{4^4}{4}\right)^{\frac{1}{4}} \Rightarrow 4
 \end{aligned}$$

$$\begin{aligned}
 12) &(0.04)^{-15} \Rightarrow \left(\frac{4}{100}\right)^{-\frac{3}{2}} \\
 &\Rightarrow \left(\frac{100}{4}\right)^{\frac{3}{2}} \Rightarrow 5^3 \Rightarrow 125
 \end{aligned}$$

$$\begin{aligned}
 13) &17^{3.5} \times 17^x = 17^8 \\
 &17^{3.5+x} = 17^8 \\
 &3.5+x = 8 \\
 &x = 4.5
 \end{aligned}$$



$$\begin{aligned}
 14) &49 \times 49 \times 49 \times 49 = ? \\
 &= 7^2 \times 7^2 \times 7^2 \times 7^2 \\
 &= 7^{2+2+2+2} \\
 &= 7^8
 \end{aligned}$$

$$\begin{aligned}
 15) &= 8^{-25} - 8^{-26} \\
 &= \frac{1}{8^{25}} - \frac{1}{8^{26}} \\
 &= \frac{8-1}{8^{26}} \\
 &= \frac{7}{8^{26}} \\
 &= 7 \times 8^{-26}
 \end{aligned}$$

$$\begin{aligned}
 16) &= (64)^{-\frac{1}{2}} - (-32)^{\frac{4}{5}} \\
 &= \frac{1}{(64)^{\frac{1}{2}}} - \frac{1}{(-32)^{\frac{4}{5}}}
 \end{aligned}$$

$$\begin{aligned}
 &= \frac{1}{8} - \frac{1}{(-2)^4} \\
 &= \frac{1}{8} - \frac{1}{16} \\
 &= \frac{2-1}{16} = \frac{1}{16}
 \end{aligned}$$

$$17) (18)^{3.5} \div (27)^{3.5} \times 6^{3.5} = 2^x$$

$$\begin{aligned}
 &= \left(\frac{18 \times 6}{27}\right)^{3.5} = 2^x \\
 &= (2^2)^{3.5} = 2^x \\
 &\rightarrow 2^7 = 2^x \\
 &\rightarrow x = 7
 \end{aligned}$$

$$\begin{aligned}
 18) &= \frac{(25)^{7.5} \times 5^{2.5}}{(125)^{1.5}} = 5^x \\
 &\rightarrow 5^{15} \times 5^{2.5} \times 5^{-4.5} = 5^x \\
 &\rightarrow 5^{13} = 5^x \\
 &\rightarrow x = 13
 \end{aligned}$$

$$\begin{aligned}
 19) &= \frac{(243)^{0.13} \times (243)^{0.07}}{7^{0.25} \times 49^{0.075} \times 343^{0.2}} \\
 &= \frac{(243)^{0.2}}{7^{0.25+0.15+0.6}} \\
 &= \frac{(3^5)^{1/4}}{7^1} \rightarrow \frac{3}{7}
 \end{aligned}$$

$$\begin{aligned}
 20) &\left(\frac{a}{b}\right)^{x-1} = \left(\frac{b}{a}\right)^{x-3} \\
 &= \left(\frac{a}{b}\right)^{x-1} = \left(\frac{a}{b}\right)^{3-x} \\
 &\Rightarrow x-1 = 3-x \Rightarrow 2x = 4 \\
 &\Rightarrow x = 2
 \end{aligned}$$

$$21) \quad 2^{2n-1} = \frac{1}{8^{n-3}}$$

$$2^{2n-1} = \frac{1}{2^{3n-9}}$$

$$2^{2n-1} = 2^{-3n+9}$$

$$2n-1 = -3n+9$$

$$5n = 10$$

$$n = 2$$

$$22) \quad 5^a = 3125, \quad 5^{a-3} = 5^{5-3} = 5^2 = 25$$

$$5^a = 5^5$$

$$a = 5$$

$$23) \quad \frac{5 \cdot \sqrt{5 \times 5^3}}{5^{\frac{-3}{2}}} = 5^{a+2}$$

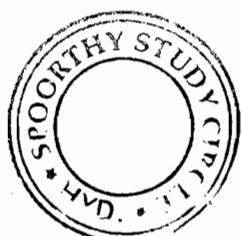
$$5^{1+\frac{1}{2}+3+\frac{3}{2}} = 5^{a+2}$$

$$5^6 = 5^{a+2}$$

$$6 = a+2$$

$$(c-)$$

$$a = 4$$



$$24) \quad \sqrt{2^n} = 64$$

$$(2^n)^{1/2} = 2^6$$

$$2^{n/2} = 2^6$$

$$\frac{n}{2} = 6$$

$$n = 12$$

$$25) \quad (\sqrt{3})^5 \times 9^2 = 3^n \times 3\sqrt{3}$$

$$3^{\frac{5}{2}} \times 3^4 = 3^n \times 3^1 \times 3^{\frac{1}{2}}$$

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

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

$$n = 5$$

$$26) \quad \frac{9^n \times 3^5 \times 27^3}{3 \times 81^4} = 27$$

$$\frac{3^{2n} \times 3^5 \times 3^9}{3^1 \times 3^{16}} = 3^3$$

$$3^{2n+5+9-1-16} = 3^3$$

$$3^{2n-3} = 3^3$$

$$2n-3 = 3$$

$$2n = 6$$

$$n = 3$$

$$27) \quad 2^{n+4} - 2^{n+2} = 3 \quad n \text{ equals to}$$

$$2^{n+2} (2^2 - 1) = 3$$

$$2^{n+2} (3) = 3$$

$$2^{n+2} = 2^0$$

$$n+2 = 0$$

$$n = -2$$

$$28) \quad 2^{n-1} + 2^{n+1} = 320$$

$$2^n \cdot 2^{n-1} + 2^n \cdot 2^1$$

$$\frac{2^n}{2^1} + 2^n \cdot 2^1$$

$$2^{n-1} (1+2^2) = 320$$

$$2^{n-1} (-5) = \cancel{320}^{64}$$

$$2^{n-1} = 2^6$$

$$n-1 = 6$$

$$n = 7$$

$$29) \quad 3^x - 3^{x-1} = 18$$

$$3^{x-1} (3^1 - 1) = \cancel{18}^9$$

$$3^{x-1} = 3^2$$

$$x-1 = 2$$

$$x = 3$$

$$\Rightarrow x^x \Rightarrow 3^3 \Rightarrow 27$$

$$30 = \frac{2^{n+4} - 2 \cdot 2^n}{2 \cdot 2^{n+3}} + 2^{-3}$$

$$= \frac{2^n \cdot 2^4 - 2 \cdot 2^n}{2^1 \cdot 2^n \cdot 2^3} + \frac{1}{2^3}$$

$$= \frac{16 - 2}{16} + \frac{1}{8}$$

$$= \frac{14}{16} + \frac{1}{8} \Rightarrow \frac{8}{8} \Rightarrow 1.$$

$$31 \quad x = 3 + 2\sqrt{2}, \quad \sqrt{x} - \frac{1}{\sqrt{x}}$$

$$\sqrt{x} = \sqrt{3 + 2\sqrt{2}}$$

$$= \sqrt{(\sqrt{2})^2 + (\sqrt{1})^2 + 2\sqrt{2} \times \sqrt{1}}$$

$$= \sqrt{(\sqrt{2} + \sqrt{1})^2}$$

$$\sqrt{x} = \sqrt{2 + 1}$$

$$\frac{1}{\sqrt{x}} = \frac{1}{\sqrt{2+1}} \times \frac{\sqrt{2-1}}{\sqrt{2-1}} \Rightarrow \sqrt{2-1}$$

$$32 \quad x = 10^{0.48} \quad | \quad x^z = y^2, z = ?$$

$$y = 10^{0.7}$$

$$x^z = y^2$$

$$(10^{0.48})^z = (10^{0.7})^2$$

$$z \times 0.48 = 2 \times 0.7$$

$$z = \frac{0.7}{0.24} = \frac{70}{24} = \frac{35}{12} = 2.9$$

$$33 \quad m^n = 121 = (m-1)^{n+1}$$

$$11^2 = 121 \Rightarrow (11-1)^{2+1}$$

$$m = 11, n = 2 \quad = (10)^3$$

$$= 1000$$

$$34 = \frac{243^{\frac{n}{5}} \times 3^{2n+1}}{9^n \times 3^{n-1}}$$

$$= \frac{(3^8)^{\frac{n}{5}} \times 3^{2n+1}}{3^{2n} \times 3^{n-1}} \Rightarrow \frac{3^n \cdot 3^{2n+1}}{3^{2n} \cdot 3^{n-1}}$$

$$\Rightarrow 3^{n+2n+1-2n-n+1}$$

$$\Rightarrow 3^2 \Rightarrow 9$$

$$35 = (216)^{\frac{3}{5}} \times (2500)^{\frac{2}{5}} \times 300^{\frac{1}{5}}$$

$$= (2^3 \times 3^3)^{\frac{3}{5}} \times (5^4 \times 2^2)^{\frac{2}{5}} \times (3^1 \times 5^2 \times 2^2)^{\frac{1}{5}}$$

$$= 2^{\frac{9}{5} + \frac{4}{5} + \frac{2}{5}} \times 3^{\frac{9}{15} + \frac{1}{15}} \times 5^{\frac{8}{5} + \frac{2}{5}}$$

$$= 2^3 \times 3^2 \times 5^2$$

ରେଶ୍ଯୁଲ୍ଟ୍ ନାମ୍ବର୍ =  $(3+1)(2+1)(2+1)$

$$= (4)(3)(3)$$

$$= 36$$

ଫର୍ମ ରେଶ୍ଯୁଲ୍ଟ୍ ନାମ୍ବର୍ =  $3+2+2 = 7$ .



# AREAS

## பிரச்சினை

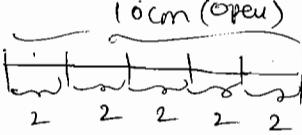
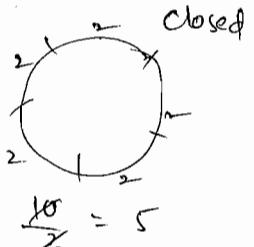
1)  $A = l \times b = 5.5 \times 3.75$

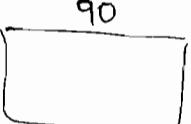
$$\begin{aligned} \text{திடும்} &= 5.5 \times 3.75 \times 800 \\ &= 44 \times 375 \\ &= 16500 \end{aligned}$$

2) பிரச்சினை மாறுதல்  
 $A_1 = A_2$

$$\begin{aligned} l_1 \times b_1 &= l_2 \times b_2 \\ 18 \times 10^2 &= 25 \times b_2 \\ b_2 &= \frac{36}{5} = 7.2 \end{aligned}$$

3) 10cm, 2cm வீசு கூடுதல்

i) 
 $(ii)$  
 $\frac{10}{2} = 5 \quad (5+1=6)$


 $90$   
 $50 \Rightarrow \frac{280}{5} = 56$

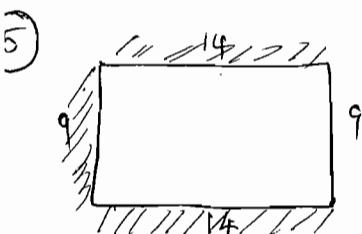
4)  $l : b = 160\% : 100\% \Rightarrow 8 : 5$

$13 \xrightarrow{\times 8} 24 \text{ cm}$

$18 \xrightarrow{\times 8} 64$

$b 5 \xrightarrow{\times 8} 40$

$$\begin{aligned} \text{Area} &= l \times b \\ &= 64 \times 40 \\ &= 2560 \end{aligned}$$

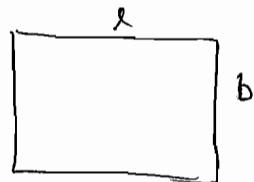


சுடுவீரன் =  $37 - 9 = 28$

எக்டை =  $\frac{28}{2} = 14$

$$\begin{aligned} \text{கெட்டி} &= 14 \\ &= 14 \times 9 \\ &= 126 \end{aligned}$$

6)



$2(l+b) = 206$

$$\begin{array}{r} + l+b = 103 \\ l-b = 23 \\ \hline \end{array}$$

$l-b = 23$

$63-b = 23$

$b = 40$

$2l = 126$

$l = \frac{126}{2}$

$l = 63$



$$\begin{aligned} A &= l \times b \\ &= 63 \times 40 \\ &= 2520 \end{aligned}$$

7)

$l \quad b$   
 $x+20 \quad x$

$\text{நடைபோக்கு} \times \frac{26.5 \text{ Rs/m}}{102} = 5300$

$\text{நடைபோக்கு} = 200$

$2(l+b) = 200$

$2(x+20+x) = 200$

$2x = 80$

$x = 40$

$l = x+20 \Rightarrow 40+20 = 60$

8)

$\frac{l}{100} : \frac{b}{360}$

$5x : 3x$

$2(l+b) = 800$

$2(5x+3x) = 800$

$16x = 800$

$x = 50$

$\text{Area} = l \times b$

$= 50 \times 30$

$= 5 \times 50 \times 3 \times 50$

$= 37500$

R S Agarwal Bit to Bit by Sagar Sir @Spoorthy Ashok Nagar- 6303450967

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**ARITHMETIC**  
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$$⑨ \frac{\text{వాయిదు}}{\text{మర్పిల్లిత ఏ}} = \frac{l}{2(l+b)} \times \frac{1}{3}$$

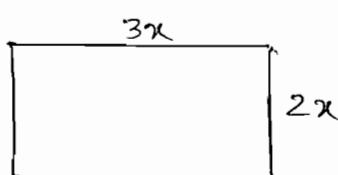
$$3l = 2l + 2b$$

$$l = 2b$$

$$\frac{l}{b} = \frac{2}{1}$$

$$l:b = 2:1$$

⑩



$$\text{మర్పిల్లిత ఏ} = 2(l+b) = 1600$$

$$= 2(3x+2x) = 1600$$

$$5x = 800$$

$$x = 160$$

$$\text{ధూమ్రాంగు} = \frac{1}{2} \pi r^2 \times 200$$

$$= 12 \text{ hr} \times 8 \text{ min}$$

$$= \frac{2}{12} \times \frac{5}{18} \frac{\text{m}}{\text{s}} \times 8 \times 60 \frac{\text{sec}}{\text{min}}$$

$$= 1600 \text{ m}$$

$$\text{Area} = l b$$

$$= 3x \times 2x$$

$$= 3 \times 160 \times 2 \times 160$$

$$= 153600$$



⑪

$$l \quad b$$

$$x \text{ అట } x-5$$

$$\text{మర్పిల్లిత} = lb = 750$$

$$x(x-5) = 750$$

Go with Options

(A)  $15(10)$  X

(B)  $22.5(17.5)$  X

(C)  $25(20)$  X

(D)  $30(25)$  ✓

$$⑫ l:b = \frac{23}{15} : \frac{20}{15} = 23:20$$

$$l = 23x, b = 20x - \text{లన్నానుపథ}$$

$$A = lb = 460$$

$$23x \times 20x = 460$$

$$x^2 = 1$$

$$x = 1$$

$$\text{ప్రశ్నల్లి} b = 20x$$

$$= 20 \times 1$$

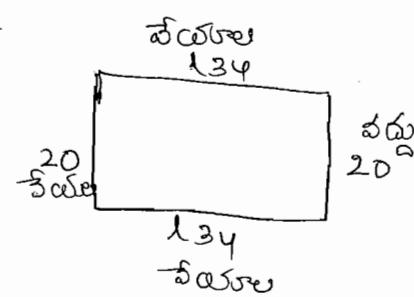
$$= 20$$

⑬

$$A = lb = 680$$

$$l \times 10 = 680$$

$$l = 34$$



$$\text{ప్రశ్నల్లి} = 34 + 34 + 20 \\ = 88$$

⑭

$$\frac{\text{మర్పిల్లిత}}{\text{ప్రశ్నల్లి}} = \frac{2(l+b)}{b} \times \frac{5}{1}$$

$$2l + 2b = 5b$$

$$\frac{l}{b} = \frac{3}{2}$$

$$l:b = 3:2$$

$$3x, 2x$$

$$A = lb = 216$$

$$3x \times 2x = 216$$

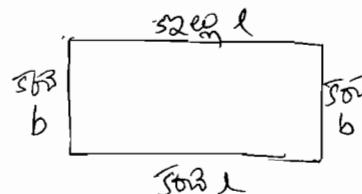
$$x^2 = 36$$

$$x = 6$$

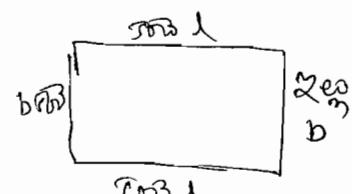
$$\text{వాయిదు} = 3x = 3 \times 6 = 18$$

⑮

Case i: ఇట్లు - వాయిదు



Case ii: ఇట్లు - ప్రశ్నల్లి



(A)  $15 \times 6.67$

(B)  $20 \times 5$

(C)  $30 \times 3.33$

(D)  $40 \times 2.5$

(16)

$$\begin{array}{l}
 l \quad b \\
 4x, \quad 3x \\
 A = lb = 1500 \\
 = 4x \times 3x = \frac{2000}{7500} 625 \\
 x^2 = 625 \\
 x = 25
 \end{array}$$

వర్షాపు లంగ =  $2(l+b)$

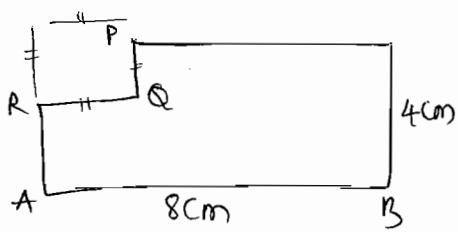
$$\begin{aligned}
 &= 2(4x+3x) \\
 &= 14x \\
 &= 14 \times 25 \\
 &= 350 \text{ m.}
 \end{aligned}$$

$$\begin{array}{l}
 (2l+4b = 34) \times 2 \\
 4l+8b = 68 \\
 4l+2b = 38 \\
 \hline
 6b = 30 \\
 b = 5
 \end{array}
 \quad \left| \begin{array}{l}
 2l+4b = 34 \\
 2l+20 = 34 \\
 2l = 14 \\
 l = 7
 \end{array} \right.$$

$$\begin{array}{l}
 \text{ప్రాణి} = 350 \text{ m} \times 0.25 \text{ m} \\
 = 87.5 \text{ R.s.}
 \end{array}$$

$$\begin{array}{l}
 \text{వైశాల్య} = 2l \times 2b \\
 = 2 \times 7 \times 2 \times 5 \\
 = 140 \text{ cm}^2
 \end{array}$$

(17)



$$\begin{array}{l}
 P = 2(l+b) \\
 = 2(8+4) \\
 = 24
 \end{array}$$



$$\begin{array}{l}
 \text{వైశాల్య} = l \cdot b = \frac{2}{3} \text{ hecrons} \\
 l = 3x \\
 b = 2x \\
 l + b = x
 \end{array}$$

$$\begin{array}{l}
 3x \times 2x = \frac{2}{3} \times 10,000 \text{ m}^2
 \end{array}$$

$$\begin{array}{l}
 x^2 = \frac{10000}{9} \\
 x = \sqrt{\frac{10000}{9}} \\
 x = \frac{100}{3}
 \end{array}$$

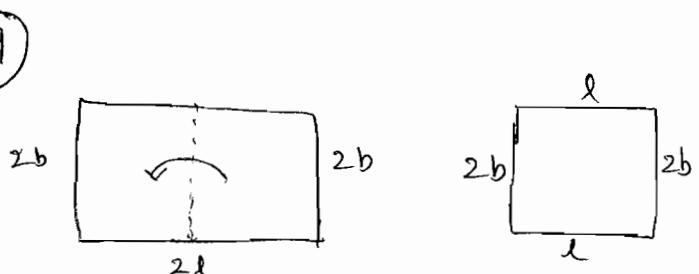
$$l = 3x \Rightarrow 3 \times \frac{100}{3} \Rightarrow 100 \text{ mtrs.}$$

(18)

$$\begin{array}{l}
 100 \\
 \swarrow a \quad \searrow b \\
 \text{అధికం} \quad \text{అన్ని}
 \end{array}$$

$$\begin{array}{l}
 \text{అధికం} = \frac{9}{11} (\text{అన్ని}) \\
 a-b = \frac{1}{5} \left( \frac{a+b}{2} \right) \\
 10a - 10b = a+b \\
 9a = 11b
 \end{array}$$

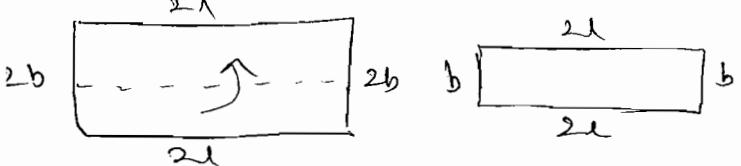
$$\begin{array}{l}
 \frac{a}{b} = \frac{11}{9} \\
 a:b = 11:9
 \end{array}$$



(19)

$$\begin{array}{l}
 \text{ఇంచలనాటక} = \frac{\text{పరిమిత వైశాల్య}}{\text{గొట్ట ఇంచ వైశాల్య}}
 \end{array}$$

$$\begin{array}{l}
 = \frac{25 \times 100 \text{ cm} \times 16 \times 100 \text{ cm}}{20 \text{ cm} \times 10 \text{ cm}} \\
 = 20000
 \end{array}$$



(22)

$$\text{శీర్ష వొడవు} \times \text{బెర మెట్టక్షేఱ} = 810 \text{ Rs.}$$

$$\text{శీర్ష వొడవు} \times 4.5 \text{ Rs} = 810 \text{ Rs.}$$

$$\text{శీర్ష వొడవు} = \frac{810}{4.5} = \frac{8100}{45} = 180 \text{ m}$$

$$d = \sqrt{l^2 + b^2} = 8\sqrt{10}$$

$$\sqrt{(3x)^2 + x^2} = 8\sqrt{10}$$

$$\sqrt{10x^2} = 8\sqrt{10}$$

$$x\sqrt{10} = 8\sqrt{10}$$

$$x = 8$$

$$\begin{aligned} P &= 2(l+b) \\ &= 2(3x+x) \\ &= 8x \\ &= 8 \times 8 \\ &= 64 \end{aligned}$$

(23)

$$\text{సదృశ్యా} = \text{శీర్ష వొడవు}$$

$$l_1 \times b_1 = l_2 \times b_2$$

$$18 \text{ m} \times b_1 = 18 \text{ m} \times \frac{75}{10} \text{ m}$$

$$b_1 = 7.5 \text{ m}$$

**ప్రశ్నగంచ అంశమణి :**

$$\textcircled{1} \quad 3 \quad 4 \quad = 5$$

$$\textcircled{2} \quad 5 \quad 12 \quad = 13$$

$$\textcircled{3} \quad 8 \quad 15 \quad = 17$$

$$\textcircled{4} \quad 7 \quad 24 \quad = 25$$

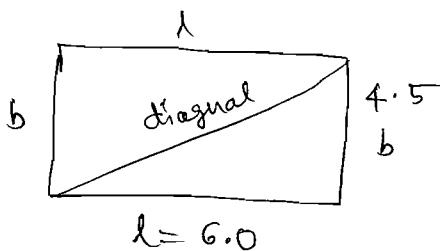
$$\textcircled{5} \quad 9 \quad 40 \quad = 41$$

$$\textcircled{6} \quad 20 \quad 21 \quad = 29$$



\*\*

(23)

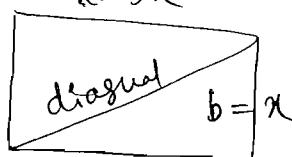


Triplet using by  $(3 \ 4 = 5)_{\times 1.5}$

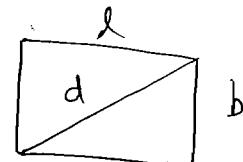
$$4.5 \ 6.0 = 7.5$$

$$\text{Area} = l \cdot b \Rightarrow 6 \times 4.5 = 27$$

(24)



(25)



$$\frac{\text{సదృశ్యా}}{\text{వొడవు}} = \frac{3}{1}$$

$$\frac{\sqrt{l^2 + b^2}}{b} = \frac{3}{1}$$

సదృశ్యా = వొడవు

$$\frac{l^2 + b^2}{b^2} = \frac{9}{1}$$

$$9b^2 = l^2 + b^2$$

$$l^2 = 8b^2$$

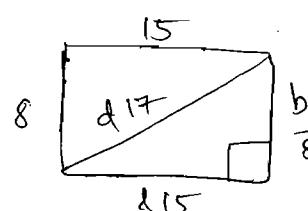
$$\frac{l^2}{b^2} = \frac{8}{1}$$

$$\frac{l}{b} = \sqrt{\frac{8}{1}}$$

$$\frac{l}{b} = \frac{2\sqrt{2}}{1}$$

$$l:b = 2\sqrt{2}:1$$

(26)



$$\text{సదృశ్యా} = 17$$

Triplet

$$8 \ 15 = 17$$

$$\text{క్రతాప్యా} = l \times b = 120$$

$$\text{ముగ్గిప్పత} = 46$$

(27)

$$\text{క్రతాప్యా} = \sqrt{l^2 + b^2} = \sqrt{41}$$

$$\frac{l^2 + b^2}{1} = 41$$

$$A = l \cdot b = 20$$

$$l \cdot b = 20$$

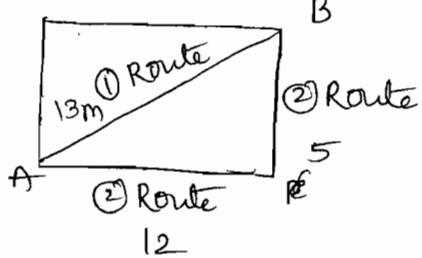
$$\begin{aligned} (l+b)^2 &= l^2 + b^2 + 2lb \\ &= 41 + 2(20) \end{aligned}$$

$$(l+b)^2 = 81$$

$$l+b = 9$$

$$\begin{aligned} \text{ముగ్గిప్పత} &= 2(l+b) \\ &= 2(9) \\ &= 18 \end{aligned}$$

28



① Route :

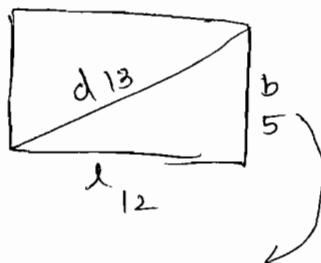
$$S = 52 \text{ m/min}$$

$$\text{దూరం} = \sqrt{l^2 + b^2} \times \text{సామాను$$

$$d = \frac{52}{60} \text{ m/min} \times \frac{15}{60} \text{ min} \\ d = 13 \text{ m}$$

$$\text{Area} = lb \Rightarrow 12 \times 5 = 60 \text{ m}^2$$

$$29) \quad 5 \quad 12 = 13$$



$$\text{స్కోఫ్ లెంగ్ } = 13 + 12 = 25 \Rightarrow \text{పొడవు} = 12$$

$$30) \quad \begin{array}{c|c} l & b \\ 3x & 2x \\ (3x+5) & 2x \end{array} \quad \begin{array}{l} A = lb = 2600 \\ (3x+5)2x = 2600 \end{array}$$

$$\text{బాటు} = b = 2x$$

$$65(40) = 2600$$

b.g 40గా ఉన్నానును. (From Options)

$$31) \quad \begin{array}{c|c} l & b \\ x+8 & x \\ x+8 & x(x+8) \end{array} \quad \begin{array}{c} \text{ప్రతిశ్రుతి} \\ x(x+8) = (x+15)(x-4) \end{array}$$

$$x+8+7 = (x+15)(x-4) \quad (x+15)(x-4)$$

$$\text{ప్రతిశ్రుతి} = \text{ప్రతిశ్రుతి}$$

$$x(x+8) = (x+15)(x-4)$$

$$x^2 + 8x = x^2 - 4x + 15x - 60$$

$$3x = 60$$

$$x = 20$$

32)

$$A_1 = lb \quad | \quad = (l+1)(b+1) \quad | \quad (l+1)(b-1)$$

$$A_2 = lb + b + l + 1$$

$$A_3 = lb + b - l - 1$$

$$A_2 - A_1 = 21$$

$$lb + b + l + 1 - lb = 21$$

$$lb - (lb + b - l - 1) = 5$$

$$l + b = 20$$

$$l - b = 4$$

$$2l = 24$$

$$l = 12$$

$$l + b = 20$$

$$l + b = 20$$

$$b = 8$$

$$P = 2(l+b) \Rightarrow 2(12+8) \Rightarrow 40$$

33)

\*\*

$$l \times b = \text{Area}$$

$$\text{పొడవు} \times \text{బెండు} = \text{ప్రతిశ్రుతి}$$

$$a\% \uparrow \downarrow b\% \uparrow \downarrow$$

$$\text{ప్రతిశ్రుతి వర్ణమార్గ} = a + b + \frac{ab}{100}$$

$$33) \quad l = 20\% \uparrow \quad b = 20\% \uparrow$$

$$\text{ప్రతిశ్రుతి వర్ణమార్గ} = a + b + \frac{ab}{100} \\ = 20 + 20 + \frac{20 \times 20}{100} \\ = 44\%$$

ప్రతిశ్రుతి పెరియింగ్.

34)

$$l = 10\% \uparrow, b = 20\% \downarrow$$

$$\text{ప్రతిశ్రుతి వర్ణమార్గ} = a + b + \frac{ab}{100} \\ = 10 - 20 + \frac{10 \times -20}{100} \\ = -10 - 2$$

$$= -12$$

ప్రతిశ్రుతి 12% అధించి.

అద్దనశర్మ ప్రతిశ్రుతి = 100 - 12 = 88%.

$$35) l = 50\% \uparrow, b = 20\% \uparrow$$

$$\begin{aligned} \text{వ్రిశ్తిపీడన మార్గ} &= a+b+\frac{ab}{100} \\ &= 50+20+\frac{50 \times 20}{100} \\ &= 80\% \uparrow \\ &= \frac{4}{5} \text{ వంతు ప్రయాసం.} \end{aligned}$$

$$36) 20\% \downarrow \quad 10\% \downarrow$$

$$\begin{aligned} \text{వ్రిశ్తిపీడన మార్గ} &= a+b+\frac{ab}{100} \\ &= -20-10+\frac{-20 \times -10}{100} \\ &= -30+2 \\ &= -28\% \downarrow \end{aligned}$$

వ్రిశ్తి 28% తగ్గింధి.

37)

$$\begin{array}{ll} \text{అనిధి} & l \quad 100\% \\ \text{ఇచ్చుడు} & 50\% \quad 50\% \downarrow \quad 100\% \\ & \quad \quad \quad 200\% \uparrow \\ & l \quad b \\ & 50\% \downarrow \quad 200\% \uparrow \end{array}$$

$$\begin{aligned} \text{వ్రిశ్తిపీడన మార్గ} &= a+b+\frac{ab}{100} \\ &= 50+200+\frac{50 \times 200}{100} \end{aligned}$$

$$= 150-100$$

$$= 50$$

$$38) \begin{array}{ll} l & b \\ r\% \downarrow & (r+5)\% \uparrow \end{array}$$

$$\text{వ్రిశ్తిపీడన మార్గ} = a+b+\frac{ab}{100}$$

$$= -r+(r+5)+\frac{-r \times (r+5)}{100}=0$$

$$\frac{-r(r+5)}{100} = 45$$

$$r(r+5) = 500$$

గంభీరమితిలో ర = 20 అనుమతి.

$$20(25) = 500$$

$$500 = 500$$

$$39) \begin{array}{ll} l & b \\ 60\% \uparrow & x\% \downarrow \end{array}$$

$$\text{వ్రిశ్తిపీడన మార్గ} = a+b+\frac{ab}{100}$$

$$= 60-x+\frac{\frac{3}{5}60x-x}{100} = 0$$

$$-x-\frac{3x}{5} = -60$$

$$+\frac{8x}{5} = +\frac{15}{60}$$

$$2x = 75$$

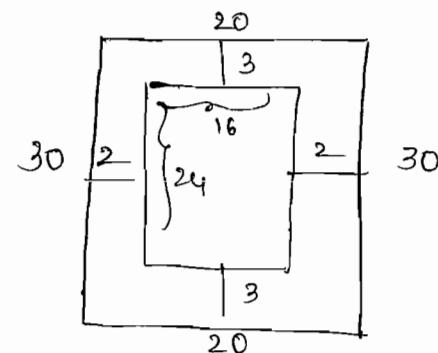
$$x = \frac{75}{2} = 37.5\%.$$

40)

$$\begin{array}{ll} l & b = A_1 \\ 10 \times & 10 = 100 \end{array} \quad \begin{array}{l} l \times b = A_2 \\ 13 \times 10 = 130 \end{array}$$

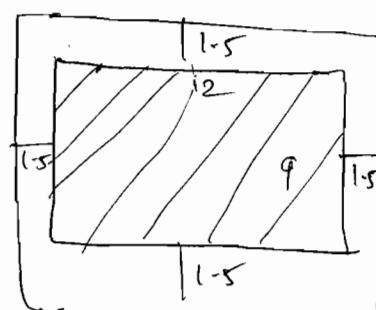
$$\frac{\text{తగ్గింధి వ్రిశ్తి}}{\text{మందిషి వ్రిశ్తి}} = \frac{A_2}{A_1} = \frac{130}{100} = \frac{130}{100}$$

41)



$$\begin{array}{ll} A_1 = lb & A_2 = lb \\ = 30 \times 20 & = 24 \times 16 \\ = 600 & = 384 \\ & = \frac{384}{600} \times 100 \\ & = 64\% \end{array}$$

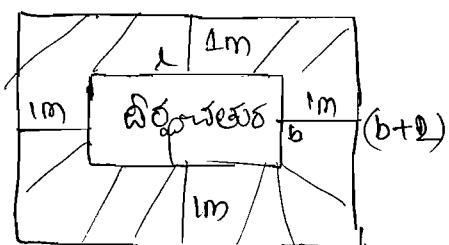
42) నా 15



$$\begin{array}{l} \text{ప్రాణి వ్రిశ్తి} = lb \\ = 12 \times 9 \end{array}$$

$$\begin{array}{l} \cdot \text{ప్రాణి} = 12 \times 9 \times 3.5 \\ = 108 \times 3.5 \\ = 378 \end{array}$$

43

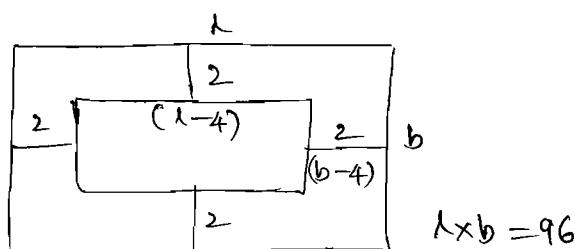


$$\text{Perimeter} = 2(l+b) = 340$$

$$\begin{aligned}\text{Perimeter of the plot} &= \text{Total } \square - \text{Inner } \square \\ &= (l+2)(b+2) - 1b \\ &= lb + 2l + 2b + 4 - lb \\ &= 2(l+b) + 4 \\ &= 340 + 4 \\ &= 344\end{aligned}$$

$$\text{Area} = 344 \times 10 \\ = 3440$$

44



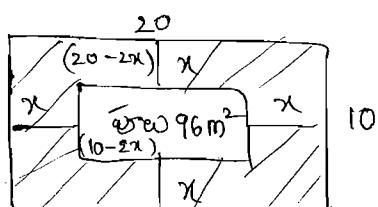
$$l \times b = 96$$

$$\text{Perimeter} = \text{Total } \square - \text{Inner } \square$$

$$\begin{aligned}&= lb - (l-4)(b-4) \\ &= lb - (lb - 4l - 4b + 16) \\ &= 4l + 4b - 16\end{aligned}$$

We cannot solve c'z data insufficient.

45



$$\text{Perimeter} = 96 \text{ m}^2$$

$$(20-2x)(10-2x) = 96$$

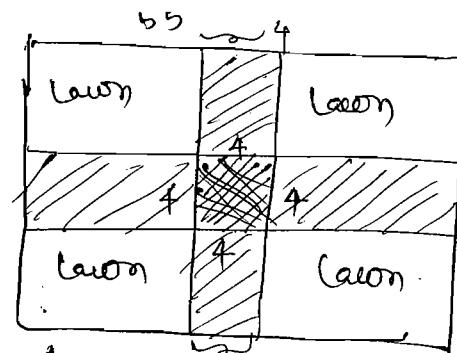
Go with options.

a) 1  $(20-2)(10-2)$

b) 2  $(20-4)(10-4) = 16 \times 6 = 96$

Option b is right  $\leftarrow$  Answer.

46

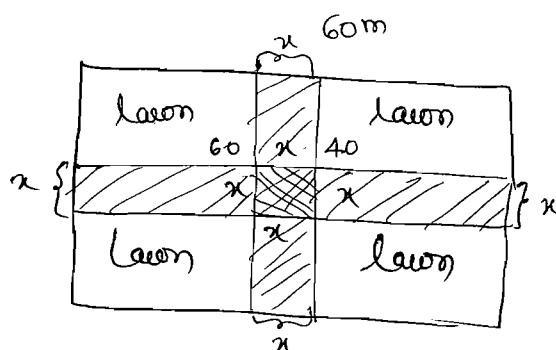


$$\begin{aligned}\text{Perimeter} &= \text{Ribbon}_1 + \text{2nd Ribbon} - \text{Common} \\ &= (55 \times 4) + (35 \times 4) - 4 \times 4 \\ &= 4(55 + 35 - 4) \\ &= 4(86)\end{aligned}$$

$$\text{Perimeter} = 344$$

$$\begin{aligned}\text{Price} &= 344 \times \frac{86}{100} \\ &= 258\end{aligned}$$

47



$$\text{Perimeter} = \text{Total } \square - \text{Lawn } \square$$

$$\begin{aligned}&= 60 \times 40 - 2109 \\ &= 2400 - 2109\end{aligned}$$

$$\text{Perimeter} = 291$$

$$\text{Perimeter} = 60x + 40x - x^2 = 291$$

Geometry

$$100x - x^2 = 291$$

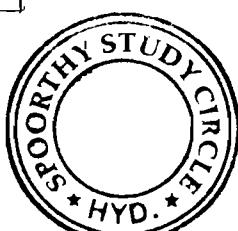
$$100(3) - 3^2 = 291$$

$$291 = 291$$

- a) 2.91 x
- b) 3 ✓
- c) 5.82 x
- d) None x

48

\* ఇంకా దీర్ఘచయలు లిఖించాలి.  
Questions ప్రాచీనమైనవా.



## చెతురణ్ణము



$$\text{వైశాల్యం } A = a^2$$

$$\text{నిర్మితీ ల ప. } P = 4a$$

$$\text{క్రెస్టు ద. } d = \sqrt{2} \cdot a.$$

(48)

$$\text{చెతురణ్ణము వైశాల్యం } = a^2 = 2550.25$$

$$a = \sqrt{2550.25}$$

$$a = 50.5$$

$$\begin{array}{l} \stackrel{5}{\cancel{5}} \\ \stackrel{5}{\cancel{5}} \end{array} \Rightarrow 255025 \quad \begin{array}{l} \stackrel{4}{\cancel{3}} \\ \stackrel{4}{\cancel{5}} \end{array}^2 = 1225$$

(49)

$$\text{చెతురణ్ణము వైశాల్యం } \times 135 \text{ Rs/hectare} = \frac{9}{1215} \text{ Rs.}$$

$$\text{చెతురణ్ణము వైశాల్యం } = 9 \text{ hecators.}$$

$$a^2 = 9 \times 10000 \text{ m}^2$$

$$a = 300$$

$$\text{నిర్మితీ ల } = 4a = 4 \times 300 = 1200$$

$$\begin{aligned} \text{ఫలి } &= 1200 \times \frac{75 \text{ Rs}}{100} \\ &= 900 \text{ Rs} \end{aligned}$$

(50)

$$\text{నిర్మితీ ల } = 4a = 24$$

$$\begin{array}{c} 24 \\ \boxed{3} + \boxed{3} + \boxed{3} + \boxed{3} + \boxed{3} = a \\ \hline a \end{array}$$

$$4a = 24, 4a = 32, 4a = 36 \\ a = 6, a = 8, a = 10, a = 19, a = 20 \quad \text{అనుమతి } = 1$$

$$\text{ఖర్చు } = 36 + 64 + 100 + 361 + 400 = a^2$$

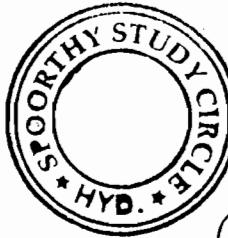
$$a^2 = 961$$

$$a = 31$$

$$\text{నిర్మితీ ల } = 4a$$

$$= 4 \times 31$$

$$= 124 \text{ cm}$$



(51)

$$\begin{aligned} \text{ఖండల నిధి } &= \frac{\text{గది వైశాల్యం}}{\text{ఒక రాశి నుండి వైశాల్యం}} \\ &\downarrow \text{ఓట్టు చెతురణ్ణము వైశాల్యం} \end{aligned}$$

$$= \frac{150}{100 \times 50} = 150 \text{ బిహిలు}$$

(52)

$$\begin{aligned} \text{ఖండల నిధి } &= \frac{\text{గది వైశాల్యం } (\text{చెతురణ})}{\text{ఒక రాశి ఖండ వైశాల్యం } (\text{చెతురణ})} \\ &= \frac{50}{12 \times 10} \end{aligned}$$

$$\text{గది వైశాల్యం } = 72 \text{ m}^2$$

$$= 72(100 \text{ cm})^2$$

$$= 72 \times 100 \times 100$$

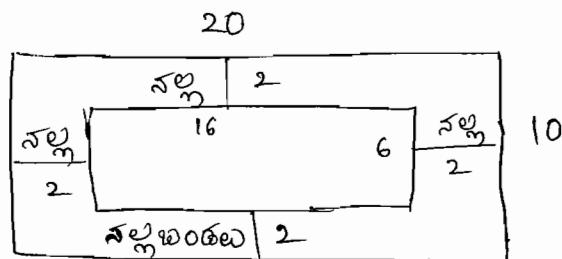
$$50 = \frac{72 \times 100 \times 100 \text{ cm}^2}{x^2}$$

$$x^2 = 144 \times 100$$

$$x = 12 \times 10$$

$$x = 120 \text{ cm}$$

(53)



$$\text{ప్రాంత భేదం వైశాల్యం } = 16 \times 6 = 96$$

$$\text{తెల్లు చందఱ } = \frac{1}{2} \times \frac{32}{96} = 32$$

$$\text{వ్యాపార భేదం } (\text{సీత }) = 96 - 32 = 64$$

$$\begin{aligned} \text{ఖండల నిధి } &= \frac{\text{గది వైశాల్యం}}{\text{ఒక రాశి ఖండ వైశాల్యం}} = \frac{16}{2 \times 2} \\ &= 16 \text{ బిహిలు } \end{aligned}$$

$$15m, 17cm = 1500 + 17 \Rightarrow 1517 \text{ cm}$$



$$= 9m 2cm$$

$$= 900 + 2cm$$

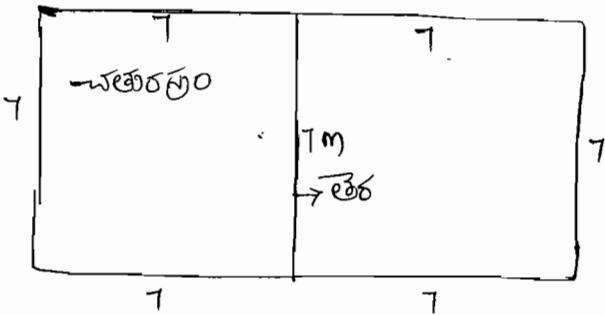
$$= 902cm$$

$$\text{ఖండల నిధి రేసి } = \text{ఖండ వాటవు రాప్పు } . 50$$

$$902, 1517 @ \text{రేసి } = 41 \text{ బిహిలు }$$

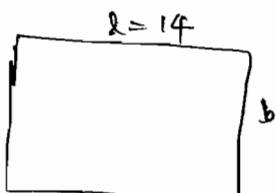
$$\begin{aligned} \text{రేసి ఖండల నిధి } &= \frac{\text{గది వైశాల్యం}}{\text{ఒక రాశి ఖండ వైశాల్యం}} = \frac{902 \times 1517}{41 \times 41} \\ &= 814 \end{aligned}$$

55) ప్రశ్నలు గట్టి



$$\text{చద్రిసత్తముకు వ్యాపారం} = 14 \times 1 \\ = 98$$

56)



$$\text{ప్రశ్నలు} = 4a = 48$$

$$a = 12$$

$$\begin{aligned}\text{వ్యాపారం} &= a^2 \\ &= 12^2 \\ &= 144\end{aligned}$$

4 cm<sup>2</sup>  
తెగులు

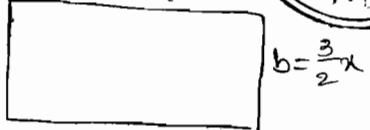
$$lb = 140$$

$$14 \times b = 140$$

$$b = 10$$

$$\begin{aligned}\text{వ్యాపారం} &= 2(l+b) \\ &= 2(14+10) \\ &= 48\end{aligned}$$

$$l = 40$$



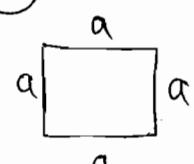
$$\text{వ్యాపారం} = x^2$$

30 కొ

$$\text{వ్యాపారం} = 3x^2$$

$$\begin{aligned}\text{వ్యాపారం} lb &= 3x^2 \\ &= 40 \times \frac{3}{2} x = 60x^2\end{aligned}$$

$$x = 20$$



$$4a = 80$$

$$a = 20$$

$$\begin{aligned}\text{వ్యాపారం} &= A_1 = (20)^2 \\ &= 400\end{aligned}$$

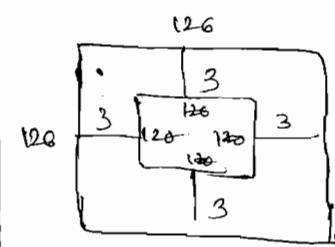
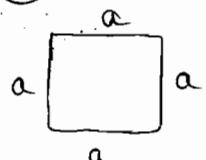
$$400 - lb = 100$$

$$lb = 300 \quad | \quad l+b = 40$$

Cheekopanam →

బుద్ధిస్తి 300, తపాలితి 40

57)

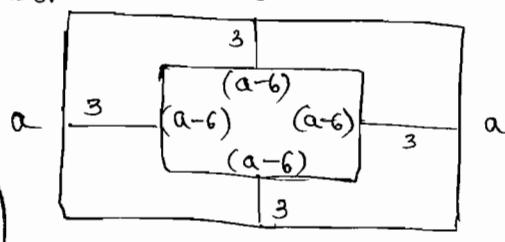


$$\text{ప్రశ్నలు} = 2(l+b) = 10080$$

$$\begin{aligned}\text{ప్రశ్నలు} &= 4a = 504 \\ &= a = 126\end{aligned}$$

$$\begin{aligned}\text{వ్యాపారం} &= \text{బయటి} - \text{ఫెల్డ్} \\ &= 126^2 - 120^2 \\ &= (126+120)(126-120) \\ &= (246)(6) \\ &= 1476\end{aligned}$$

58)



ప్రశ్నలు 4a = ?



ప్రశ్నలు = బయటి - ఫెల్డ్

$$1764 = a^2 - (a-6)^2$$

$$1764 = a^2 - (a^2 - 12a + 36)$$

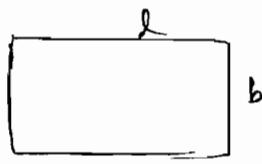
$$1764 = 12a - 36$$

$$12a = 1800$$

$$a = 150$$

$$\text{వ్యాపారం} 4a = 4(150) = 600$$

59)

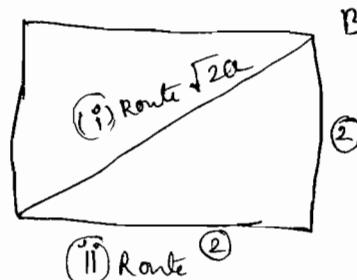


$$\frac{1}{2}(l+b) = 80$$

$$l+b = 40$$

$$A = lb$$

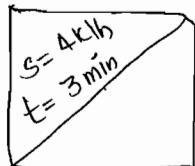
60)



$$66) \quad \text{స్కో} = \sqrt{2a} = 1.41a \quad \text{అగ్ని దుర్గా} \\ \text{ముఖ్యమైనది} = a + a = 2a \quad = 0.59a$$

$$\text{తల్పిన వెత్త} = \frac{0.59a}{2a} \times 50 \\ = 0.6 \times 50 \\ = 30\%$$

62)



$$\text{దూరం} = \sqrt{S^2 + t^2} \\ d = 4 \times \frac{5}{3} \text{ m} \times \frac{3}{5} \times 60 \text{ sec}$$

$$\text{స్కో} d = 200 \text{ m}$$

$$\text{ప్రాయం} = \frac{d^2}{2} = \frac{200 \times 200}{2} = 20000 \text{ m}^2$$

63)

$$\sqrt{2} \cdot a = 20$$

$$\sqrt{2} \cdot a = \sqrt{2} \times 10$$

$$a = 10\sqrt{2}$$

$$\text{ముఖ్యమైన} = 4a = 4 \times 10\sqrt{2} \\ = 40\sqrt{2}$$

64)

$$\text{చతురణీశ్వరం} = \frac{d^2}{2} = 69696$$

$$d^2 = 2 \times 69696$$

$$d = \sqrt{2 \times 69696}$$

$$d = \sqrt{2} \times \sqrt{69696}$$

$$d = \sqrt{2} \times 264$$

$$d = (1.414)(264)$$

$$d = 373.296$$

65)

45

$$\boxed{\begin{array}{|c|c|}\hline & 40 \\ \hline \end{array}} = \boxed{\begin{array}{|c|c|}\hline d & 30 \\ \hline \end{array}}$$

$$45 \times 40 = \frac{d^2}{2}$$

$$d^2 = 90 \times 40$$

$$d = \sqrt{3600}$$

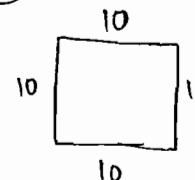
$$d = 60$$

$$66) \quad \text{ప్రాయం} = \frac{120}{6} : \frac{100}{5} = \frac{6}{5}$$

$$\text{ప్రాయం} = \frac{6 \times 5}{5 \times 5} = \frac{6}{5}$$

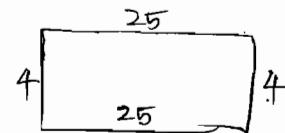
వెడుట్టు నమ్రమైన భూమి.

67)



$$\text{ప్రాయం} 100 \text{ m}^2$$

$$\text{ముఖ్యమైన} P_1 = 40$$



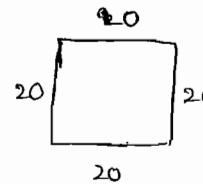
$$\text{ప్రాయం} = 100 \text{ m}^2$$

$$\text{ముఖ్యమైన} P_2 = 58$$

$$P_1 < P_2$$

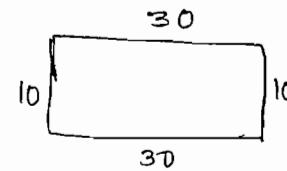
68)

పిట్టిక్ నమ్రమైన లిఫ్టును వు. (ఇంగ్లీషు)



$$\text{ముఖ్యమైన} = 80$$

$$\text{ప్రాయం} A = 20^2 \\ = 400$$

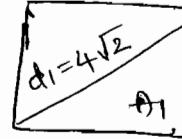


$$\text{ముఖ్యమైన} = 80$$

$$\text{ప్రాయం} B = 30 \times 10 \\ = 300$$

$$A > B$$

69)



$$A_1 = 2 \times \frac{d_1^2}{2}$$

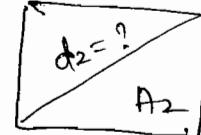
$$\frac{d_2^2}{2} = 2 \times \frac{d_1^2}{2}$$

$$d_2^2 = 2 \times 4\sqrt{2} \times 4\sqrt{2}$$

$$d_2^2 = 64$$

$$d_2 = \sqrt{64}$$

$$d_2 = 8$$



70

$$\frac{A_1}{A_2} = \frac{a^2}{(\sqrt{2}a)^2} = \frac{1}{2}$$

$$A_1 : A_2 = 1 : 2$$

73

$$A = a^2 = 1 \text{ hectare}$$

$$a^2 = 10000 \text{ m}^2$$

$$a = 100$$

$$b = 101$$

$$1\%$$

71

$$A_1 : A_2 = 1 : 4$$

RS Agarwal Question 6 Order 2వ్యతి

$$\frac{A_1}{A_2} = \frac{\frac{x^2}{2}}{\frac{(2x)^2}{2}} = \frac{x^2}{(2x)^2} = \frac{x^2}{4x^2} = \frac{1}{4}$$

$$A_1 : A_2 = 1 : 4$$

74. వర్తుల నిష్టత్తు = ఎత్తుల నిష్టత్తు = లభినపుద్య

అంగనర్థల నిష్టత్తు = ప్రంతకేచన వుధ్వాంశనర్థల నిష్టత్తు = చూడినపుద్యాల నిష్టత్తు = చూడినపుద్య

ఇతరల నిష్టత్తు = పరిశ్రేత వ్యాసార్థల నిష్టత్తు (R) =

ఉపరివృత్త వ్యాసార్థల నిష్టత్తు (r) వ్యాసార్థాల నిష్టత్తు

\* ప్రైవెట్ - Same (నమానం)

\* ఇవన్స్ - తొఫుషమాని నమానం.

II. క్రమర్థల నిష్టత్తు = (అంగల నిష్టత్తు)^2

III. అంగల నిష్టత్తు =  $\sqrt{\text{వ్యాసార్థల నిష్టత్తు}}$

IV. అంగల నిష్టత్తు =  $\sqrt{\text{వ్యాసార్థల నిష్టత్తు}}$

$$= \sqrt{\frac{225}{256}}$$

$$= \frac{15}{16}$$

అంగుల నిష్టత్తు = 15 : 16

74

$$A_2 : A_1 = \frac{15 \times 15}{10 \times 10} = \frac{225}{100} = \frac{9}{4} \Rightarrow 9 : 4$$

75

$$A = a^2$$

$$\text{వ్యాసార్థల నిష్టత్తు} = a + b + \frac{ab}{100}$$

$$= 50 + 50 + \frac{-50 \times -50}{100}$$

$$= -100 + 25$$

$$= -75\%$$

వ్యాసార్థ = 75% తగ్గింది.

తగ్గిన తర్వాత = 100 - 75 = 25  $\Rightarrow \frac{1}{4}$

76

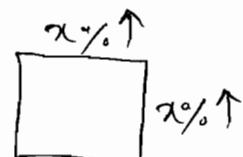
$$A = a^2$$

$$\text{వ్యాసార్థల నిష్టత్తు} = a + b + \frac{ab}{100}$$

$$= 2 + 2 + \frac{2 \times 2}{100}$$

$$= 4.04\%$$

$$77) A = a^2$$



$$\text{వ్యవస్థలో వ్యాపు} = a+b+\frac{ab}{100} = 69\%$$

$$= x+x+\frac{x \times x}{100} = 69$$

Govt's options

$$x = 30$$

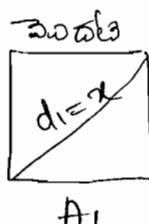
$$= 30+30+\frac{30 \times 30}{100}$$

$$= 69$$

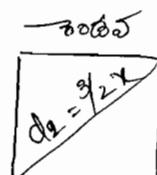
78) మండి చంపులు కొన్ని రోడ్లు చతురంగాలు

రాళ్ళ 1.5 రోడ్లు లేదా అయితే కొండు (82)

చంపులు త్రిభుజాల నిష్టత్తు?



$A_1$

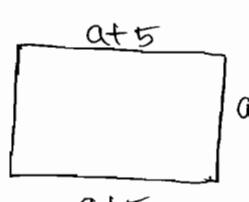
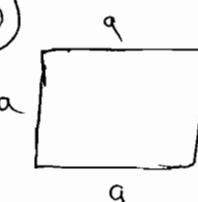


$A_2$

$$\frac{A_1}{A_2} = \frac{\frac{d_1^2}{2}}{\frac{d_2^2}{2}} = \frac{x^2}{(\frac{3}{2}x)^2} = \frac{4}{9}$$

$$\begin{aligned} 79) \text{వ్యవస్థలో వ్యాపు} &= a+b+\frac{ab}{100} \\ &= 40+30+\frac{40 \times 30}{100} \\ &= 82\% \uparrow \end{aligned}$$

80)

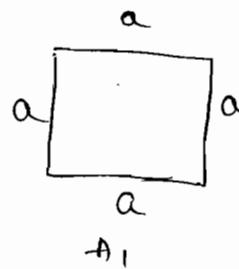


$$= \frac{a+5}{a} \times \frac{3}{2}$$

$$= 2a+10 = 3a$$

$$a = 10$$

81)



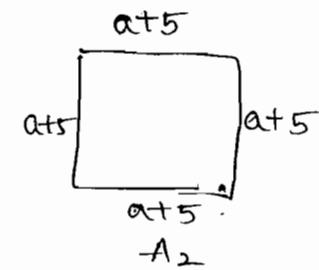
$$A_2 - A_1 = 165$$

$$(a+5)^2 - a^2 = 165$$

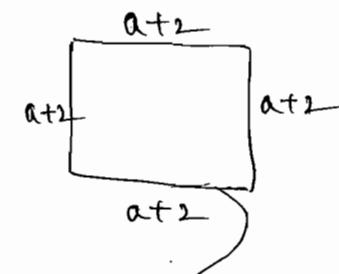
$$a^2 + 10a + 25 - a^2 = 165$$

$$10a = 140$$

$$a = 14$$



$a$



$a+2$

$$(a+2)^2 - a^2 = 32$$

$$a^2 + 4a + 4 - a^2 = 32$$

$$4a = 28$$

$$a = 7$$

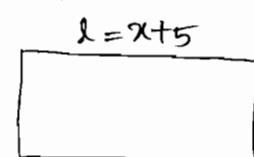
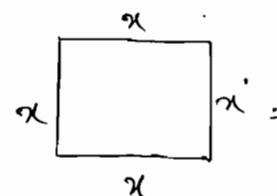
ఎండుశాశ్వతును రేఖా ఫాక్టు

$$= a+2$$

$$= 7+2$$

$$= 9$$

83)



$b = x-3$

$$x^2 = (x+5)(x-3)$$

$$x^2 = x^2 + 5x - 3x - 15$$

$$+2x = +15$$

$$\text{టీ}||-\text{చీ}||-\text{మీ}||\text{సె} = 2(l+b)$$

$$= 2(x+5+x-3)$$

$$= 2(2x+2)$$

$$= 2(15+2)$$

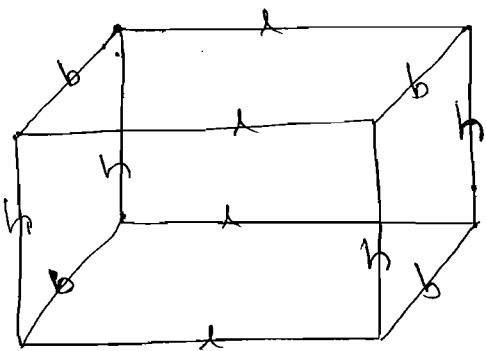
$$= 34$$

$$A^* = a^2$$

$$= 10^2$$

$$= 100 \text{ sq cm}$$

## ధీర్ఘ ఫున్చన్మ (Cuboid)



84)  $l=25, b=12, h=6$

$$\begin{aligned}
 \text{ప్రెసల్యూ} &= 4\text{గోడల} + \text{floor} \\
 &= 2h(l+b) + lb \\
 &= 2 \times 6 (25+12) + 25 \times 12 \\
 &= 12(62) \\
 &= 744 \text{ m}^2 \\
 \text{ఖర్చు} &= \frac{186}{744} \times \frac{75}{100} \text{ Rs} \\
 &= 558 \text{ Rs.}
 \end{aligned}$$

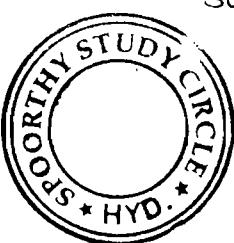
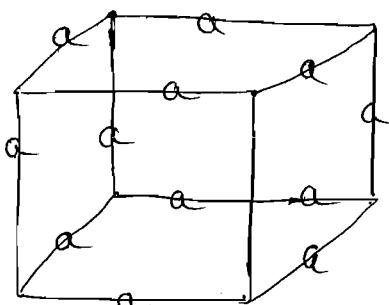
① 4గోడల ప్రెసల్యూ (తలతల)  $= 2h(l+b)$

② పెట్టతల (సంపూర్ణతల) ప్రెసల్యూ  $= 2(lb+bh+lh)$

③ ఘనవరణాశాస్త్రం  $V = l b h$

④ టర్మిన్ ద  $d = \sqrt{l^2 + b^2 + h^2}$

## ఫున్చన్మ (Cube)



85)  $l=10, b=7, h=5$   
 $\text{గోడల ప్రెసల్యూ} = 2h(l+b)$   
 $= 2 \times 5 (10+7)$   
 $= 170$

టెంకీ ఉదాహరణ ప్రెసల్యూ =

$$\begin{aligned}
 &= \text{గోడల} + \text{పెట్టతల} + \text{ఘనవరణాశాస్త్రం \\
 &= 2 \times (1 \times 3) + 1 \times (2 \times 1.5) + 2 \times (1 \times 1.5) \\
 &= 6 + 3 + 3 \\
 &= 12
 \end{aligned}$$

రంసు వేయాలు నుండి  $= 170 - 12 = 158$

ఖర్చు  $= 158 \times 3 \text{ Rs} = 474 \text{ Rs.}$

86)  $l \quad b \quad h$   
 గట 4గోడల  $A_1 = 2h(l+b)$   
 $2l \quad 2b \quad 2h$

గట 4గోడల  $A_2 = 2 \times 2h(2l+2b)$   
 $= 4 \times 2h(l+b)$   
 $A_2 = 4 \times A_1$

ఖర్చు  $= 4 \times 475 = 1900$

\* ఘనము రట్టంలు లయించి.....

$$\left. \begin{array}{l} \text{అంశ} = a, \text{ రట్టం ఘనము} = 2a \\ \text{ప్రెసల్యూ} = A, \text{ ప్రెసల్యూ} = 4A \end{array} \right\} \text{వ్యాపారం}$$

\* Length ↑

87

గదిగోటలై = paper ప్రాయం + దృష్టిమిట్స్  
 ప్రాయం =  $65 + 15 = 80$

r - పొత్తు వ్యాసము.

④  $\Delta = rs$

⑤  $\Delta = \frac{1}{2}ab\sin\theta$



⑥ (i) paper పొదవు  $\times$  2 రూ/m =  $\frac{130}{260}$  రూ

ప్రశ్నకాచన ల = 130m, b = 50cm  
 $= \frac{50}{100} = \frac{1}{2} m$

paper ప్రాయం =  $l \times b$   
 $= 130 \times \frac{1}{2}$   
 $= 65 \text{ m}^2$

⑥ (ii) నిఱ్మించుకున్న త్రిభుజం =  $2(l+b)$

అంగుహించుకున్న త్రిభుజం =  $l+b$

బిట్ట  $\frac{l+b}{\text{అంగుహించు}} = \frac{h}{l+b} = \frac{2}{5}$

$h = 2x, l+b = 5x$

$4\text{గోటి} = 2h(l+b)$   
 $80 = 2 \times 2x(5x)$   
 $80 = 20x^2$

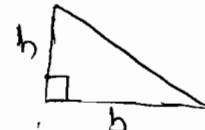
$x^2 = 4$   
 $x = 2$

$h = 2x = 2 \times 2 = 4 \text{ meters.}$

**శ్రీధురావు**

అభ్యర్థి ప్రాయం :-

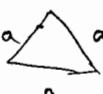
①  $\Delta = \frac{1}{2}bh$



②  $\Delta = \sqrt{s(s-a)(s-b)(s-c)}$



③  $\Delta = \frac{abc}{4R}$



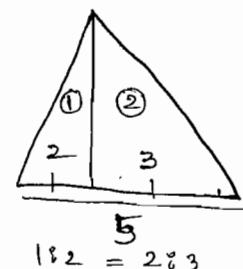
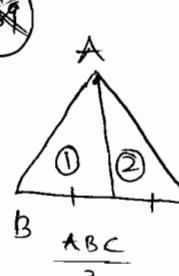
(R - పొత్తు)  
 వ్యాసము

⑧ 88  $\Delta = \frac{1}{2} \times 15 \times 12 = 90$

2nd  $\Delta \text{ ప్రాయం} = \frac{1}{2} \times b \times h = 180$

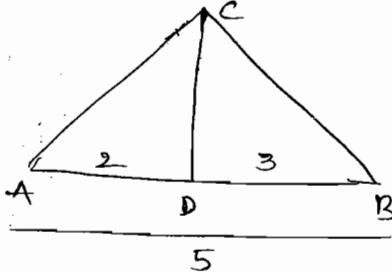
$= \frac{1}{2} \times 20 \times h = 180$

$= h = 18$



\* శీర్షమనండి ఎచుటిఖూడానిః వస్తు సిఫ్తులు విభజిస్తాయి  
 కొని, అంగుహించుతే లో ఆంగుహించు విశ్లేషణ పుంచాయి.

⑨

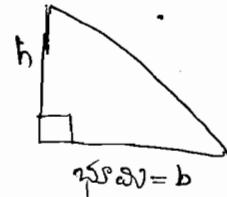


$$\frac{\Delta ABC}{\Delta ADC} = \frac{2}{5}$$

⑩

$$\Delta = \frac{1}{2}bh$$

$$40 \times 10 = \frac{1}{2} \times b \times h$$



$$h = 80$$

⑪

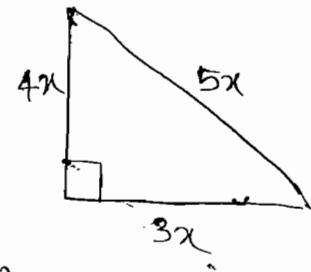
$$\Delta = \frac{1}{2}bh = 1176$$

$$= \frac{1}{2} \times 3x \times 4x = 1176$$

$$x^2 = 196$$

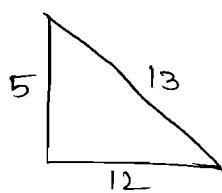
$$x = 14$$

$$h = 4x = 4(14) \Rightarrow 56 \text{ cm}$$



92)  $5 \times 12 = 13$  అనికి క్రమాను

$$\begin{aligned}\Delta &= \frac{1}{2} b h \\ &= \frac{1}{2} \times 12 \times 5 \\ &= 30 \text{ cm}^2\end{aligned}$$



93) ఖూబిలనవ్వతో  $= \left( \frac{1}{2} : \frac{1}{3} : \frac{1}{4} \right) \times 12$

$$= 6 : 4 : 3 \quad \boxed{\begin{matrix} 2, 3, 4 \text{ ఉన్నాయి} \\ = 12 \end{matrix}}$$

-మార్గం  $\begin{matrix} 13 \xrightarrow{\times 4} 52 \text{ cm} \\ 3 \xrightarrow{\times 4} 12 \text{ cm} \end{matrix}$

94)  $\Delta = \frac{1}{2} b h = 216$

$$= \frac{1}{2} \times 4x \times 3x = 216$$

$$x^2 = 36$$

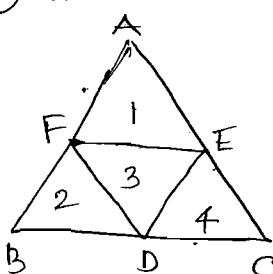
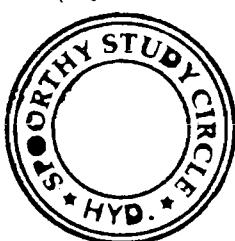
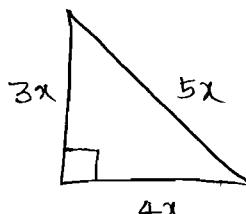
$$x = 6$$

-మొత్తము  $= 3x + 4x + 5x$

$$= 12x$$

$$= 12(6)$$

$$= 72$$



$$\textcircled{1} = \textcircled{2} = \textcircled{3} = \textcircled{4} \Rightarrow \frac{\Delta ABC}{4}$$

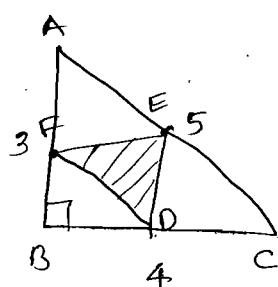
D, E, F ఎ వ్యాఖ్యానించుట

\*\*

95)  $\Delta ABC = \frac{1}{2} \times 3 \times 4$

$$= 6$$

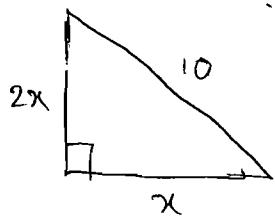
$$\begin{aligned}\Delta DEF &= \frac{\Delta ABC}{4} \\ &= \frac{6}{4} \\ &= \frac{3}{2}\end{aligned}$$



96)  $(x)^2 + (2x)^2 = 10^2$

$$5x^2 = 100$$

$$x^2 = 20$$



$$\begin{aligned}\Delta &= \frac{1}{2} b h \\ &= \frac{1}{2} \times x \times x \\ &= x^2 \\ &= 20\end{aligned}$$

97)

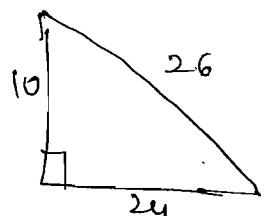
$$(5 \times 12 = 13) \rightarrow \text{అంతము}$$

$$10 \times 24 = 240$$

$$\text{మార్గం} = 10 + 24 + 26 = 60$$

$$\Delta = \frac{1}{2} \times \frac{12}{2} \times 10$$

$$\Delta = 120$$



98)

$$\text{మార్గం} = x + x + \sqrt{2}x = 6 + 3\sqrt{2}$$

$$2x + \sqrt{2}x = 6 + 3\sqrt{2}$$

Compare

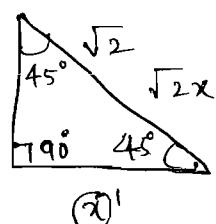
$$2x = 6$$

$$x = 3$$

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

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

$$= \frac{9}{2} = 4.5 \text{ m}^2$$

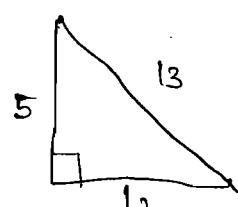


99)

అంతము ఖూబిని  $= 13$

అంతము  $= 13$

అంతము  $5 \times 12 = 13$

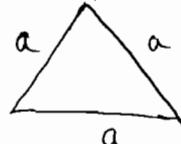


మొత్తము  $= 5 + 12 + 13 = 30$

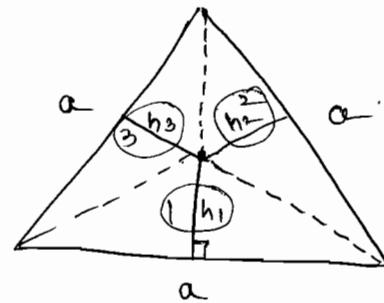
$$\text{ఒకసాధారణం} = \frac{1}{2} \times 12 \times 5 = 30$$

అంతము ఖూబిని  $= 5$

నమచౌహార్తిభుజం



(102)



$$\Delta \text{ ఒచ్చకొట్టమం } = (1) + (2) + (3)$$

$$\frac{\sqrt{3}}{4} a^2 = \frac{1}{2} \times a \times h_1 + \frac{1}{2} \times a \times h_2 + \frac{1}{2} \times a \times h_3$$

$$\frac{\sqrt{3}}{4} a^2 = \frac{a}{2} (h_1 + h_2 + h_3)$$

$$a = \frac{2}{\sqrt{3}} (h_1 + h_2 + h_3) \quad * \text{సమయం}$$

$$a = \frac{2}{\sqrt{3}} (\sqrt{3} + 2\sqrt{3} + 5\sqrt{3})$$

$$= \frac{2}{\sqrt{3}} (8\sqrt{3})$$

$$a = 16$$

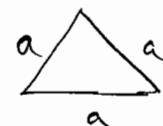
$$\text{సమాఖ్యకొలత} = 3a \Rightarrow 3(16) \Rightarrow 48$$

(103)

$$\text{మధ్యగతిశీలికణ} = \text{బట్టి} = x$$

$$\text{బట్టి} = \frac{\sqrt{3}}{2} a = x$$

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



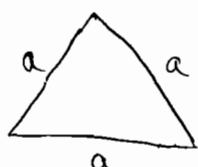
$$\text{ప్రాంతమం} = \frac{\sqrt{3}}{4} a^2$$

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

$$= \frac{x^2}{\sqrt{3}} \times \sqrt{\frac{3x^2}{3}}$$



(100)



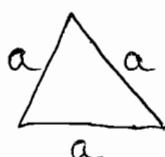
$$\frac{\sqrt{3}}{4} a^2 = 24\sqrt{3}$$

$$a^2 = 96$$

$$a = \sqrt{96} = \sqrt{16 \times 6}$$

$$\begin{aligned} \text{సమాఖ్యకొలత} &= 3a \\ &= 3 \times 4\sqrt{6} \\ &= 12\sqrt{6} \end{aligned}$$

(101)



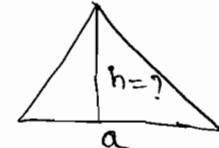
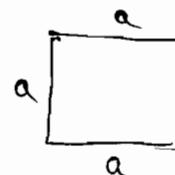
$$\frac{\sqrt{3}}{2} a = 10$$

$$a = \frac{20}{\sqrt{3}}$$

$$\Delta = \frac{\sqrt{3}}{4} a^2$$

$$= \frac{\sqrt{3}}{4} \times \frac{20}{\sqrt{3}} \times \frac{20}{\sqrt{3}}$$

$$= \frac{100}{\sqrt{3}} \text{ cm}^2$$



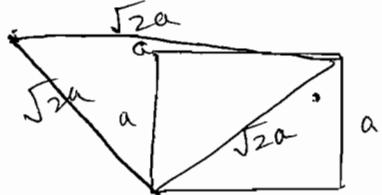
$$a^2 = \frac{1}{2} \times d \times h$$

$$h = 2a$$

(105)



105



$$\frac{\Delta}{\square} = \frac{\frac{\sqrt{3}}{4}a^2}{a^2} = \frac{\frac{\sqrt{3}}{4} \times \sqrt{2}a \times \sqrt{2}a}{a^2}$$

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

$$= \sqrt{3} : 2$$

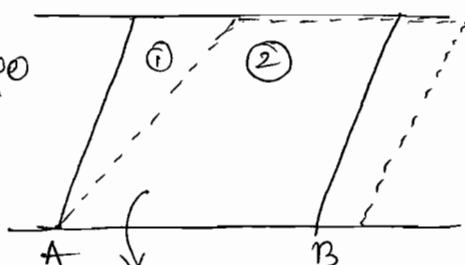
\*

\*\*

\*Imp

Some properties

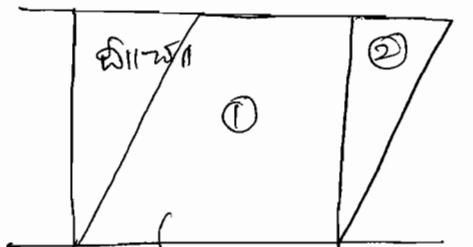
①

సమాత్రంగాలు  
మధ్య

సమాత్రంగాలు రూ

① = ②

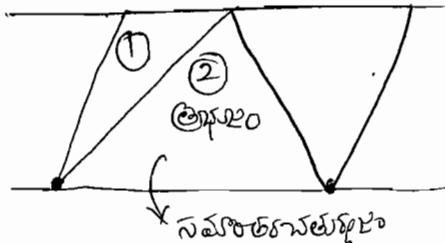
②



① సమాత్రంగాలు రూ

① = ②

③

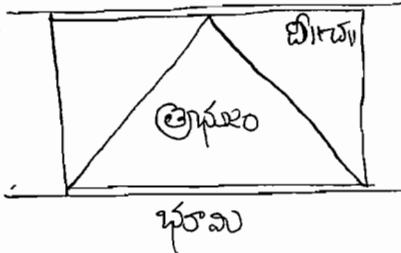


సమాత్రంగాలు రూ

$$\text{రూ} = \frac{\text{ప్రశ్న} \parallel \text{ప్ర}}{2} = \frac{\text{ప్రశ్న} \parallel \text{ప్ర}}{2}$$

\*\*

106



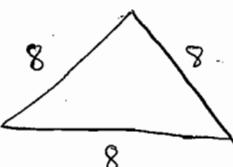
భూమి

$$\text{అభ్యూ} = \frac{\text{ప్రశ్న} \parallel \text{ప్ర}}{2}$$

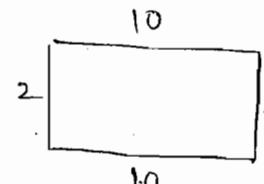
$$\text{ప్రశ్న} \parallel : \text{అభ్యూ} = 2 : 1$$

\*\*

సమాత్రంగాలు = 24 లక్షలు.



$$\begin{aligned}\text{ప్రశ్న} &= \frac{\sqrt{3}}{4} a^2 \\ &= \frac{\sqrt{3}}{4} \times 8 \times 8 \\ &= 16(1.732) \\ &= 27.2\end{aligned}$$

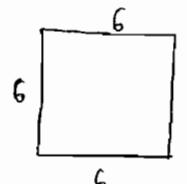


$$\begin{aligned}\text{ప్రశ్న} &= l \times b \\ &= 10 \times 2 \\ &= 20\end{aligned}$$



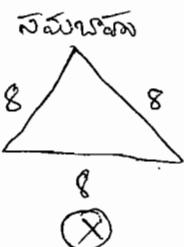
\*Imp

చతురస్రం &gt; సమాంగాలు &gt; దీప్యాలు



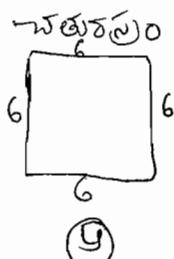
$$\begin{aligned}\text{ప్రశ్న} &= 6 \times 6 \\ &= 36\end{aligned}$$

107

 $x < y$ 

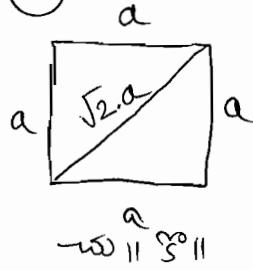
$$\text{ప్రశ్న} = 24$$

$$\begin{aligned}\text{ప్రశ్న} &= \frac{\sqrt{3}}{4} a^2 \\ &= \frac{\sqrt{3}}{4} \times 8 \times 8 \\ &= 16(1.732) \\ &= 27.712\end{aligned}$$



$$\begin{aligned}\text{ప్రశ్న} &= 24 \\ \text{ప్రశ్న} &= a^2 \\ &= 6^2 \\ &= 36\end{aligned}$$

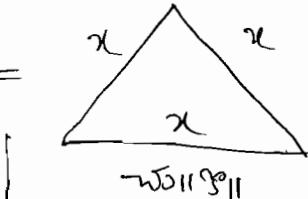
108



$$\sqrt{2}a = 12\sqrt{2}$$

$$a = 12$$

$$\begin{aligned} \text{మొత్తం} &= 4(a) \\ &= 4(12) \\ &= 48 \end{aligned}$$



$$3x = 48$$

$$x = 16$$

$$\begin{aligned} \text{ప్రతిభాగం} &= \frac{\sqrt{3}}{4} x^2 \\ &= \frac{\sqrt{3}}{4} \times 16 \times 16 \\ &= 64\sqrt{3} \end{aligned}$$

109

$$\frac{A_1}{A_2} = \frac{\frac{1}{2} b_1 h_1}{\frac{1}{2} b_2 h_2}$$

$$\frac{a}{b} = \frac{x \times h_1}{y \times h_2}$$

$$\frac{ay}{bx} = \frac{h_1}{h_2} \Rightarrow ay : bx$$

110

$$\text{సమాఖ్యలక్షించుటకు ప్రతిభాగం} = \frac{\sqrt{3}}{4} a^2 \quad (2 \text{ సాధ్య})$$

20% ↓, 20% ↓

$$\text{ప్రతిభాగం వర్ణం} = a + b + \frac{ab}{100}$$

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

$$= -40 + 4$$

$$= -36 \% \downarrow$$

111

$$4 \text{ ప్రతిభాగం} = \frac{1}{2} bh \quad \text{40% ↑} \quad \text{40% ↓}$$

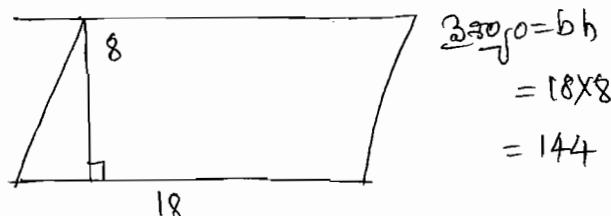
$$\begin{aligned} \Delta \text{ ప్రతిభాగం వర్ణం} &= a + b + \frac{ab}{100} \\ &= 40 - 40 + \frac{40 \times -40}{100} \\ &= -16 \\ &= 16 \% \downarrow \end{aligned}$$

112

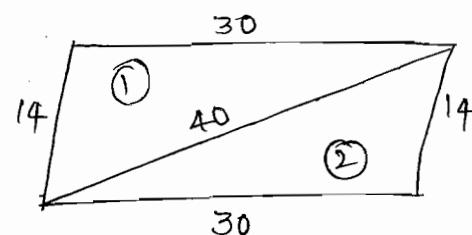
$$\text{ప్రతిభాగం} = (\text{భుజము})^2 \quad (\text{అధ్యాత్మ, చక్కనియం})$$

మొదటి ప్రతిభాగం =  $a^2$       మొదటి ఫుమ్మ = 0  
తరువాత ప్రతిభాగం =  $(2a)^2$       రెట్టు లో ఫుమ్మ =  $2a$   
=  $4a^2$       రెట్టు  $\frac{3}{3}$

114



115



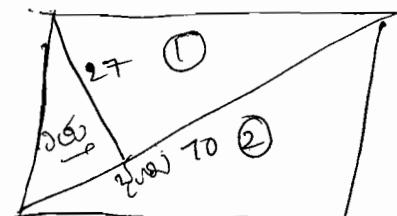
$$\text{నమాత్రం నట్టు ప్రతిభాగం} = 30 \text{ కు } \Delta \text{ ప్రామా�ం}$$

$$\begin{aligned} \Delta &= \sqrt{s(s-a)(s-b)(s-c)} \\ &= \sqrt{42(42-14)(42-30)(42-40)} \\ &= \sqrt{42 \times 28 \times 12 \times 2} \\ &= \sqrt{(7 \times 3 \times 2) \times (7 \times 2 \times 2) \times (3 \times 2 \times 2) \times 2} \\ &= 7 \times 3 \times 2 \times 2 \\ \Delta_1 &= 168 \end{aligned}$$

$$s = \frac{a+b+c}{2} = \frac{14+30+40}{2} = 42$$

$$\text{నమాత్రం నట్టు ప్రతిభాగం} = 2 \times 168 \Rightarrow 336$$

115



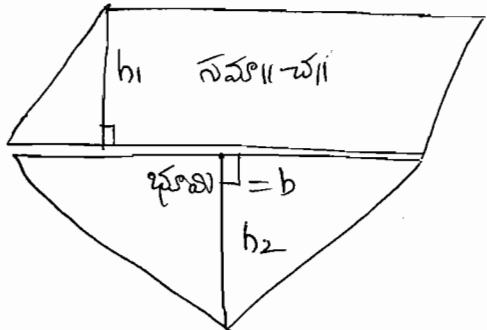
$$\text{లొచ్చు ప్రతిభాగం} = 30 \text{ కు } \Delta \text{ ప్రామాணం}$$

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

$$= \frac{1}{2} \times 70 \times 27$$

వస్తువు వొమ్మి =  $2 \times 35 \times 27$   
 $= 1890$

116



వస్తువు వొమ్మి = అనుభవాల్జో

$$b \times h_1 = \frac{1}{2} \times b \times h_2$$

$$100 = \frac{1}{2} \times h_2$$

$$h_2 = 200$$

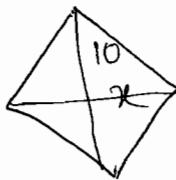
$$4a^2 = d_1^2 + d_2^2$$

$$= 4 \times \frac{1}{2} \times \frac{d_1}{2} \times \frac{d_2}{2}$$

$$= \frac{1}{2} \times d_1 \times d_2$$

\*\*

118

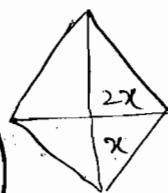


$$\text{అంగ్మి} = \frac{1}{2} d_1 d_2$$

$$150 = \frac{1}{2} \times 10 \times x$$

$$x = 30$$

119



$$\text{అంగ్మి} = \frac{1}{2} d_1 d_2 = 25$$

$$\frac{1}{2} \times x \times 2x = 25$$

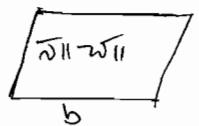
$$x^2 = 25$$

$$x = 5$$

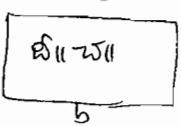
$$\text{కొట్టమితి} = 3x = 15$$

117

Parallelogram = P



Rectangle = R



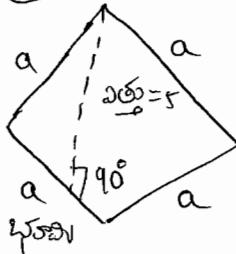
Triangle = T



$$\textcircled{1} P = R \quad \textcircled{2} P + T = 2R \quad \textcircled{3} P = 2T \quad \textcircled{4} T = \frac{R}{2}$$

\*\*

120



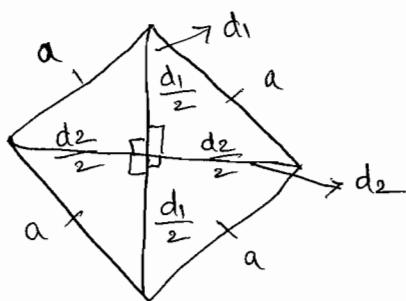
$$\text{అంగ్మి} = 4a = 56$$

$$a = 14$$

రాత్మస వస్తువు వొమ్మి శుల్కం

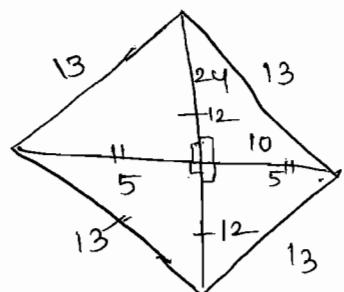
$$\begin{aligned} \text{వొమ్మి} &= b \times h \\ &= 14 \times 5 \\ &= 70 \end{aligned}$$

### Rhombus



$$\begin{aligned} a &\triangleq \frac{d_1}{2} \\ a^2 &= \left(\frac{d_1}{2}\right)^2 + \left(\frac{d_2}{2}\right)^2 \\ 4a^2 &= d_1^2 + d_2^2 \end{aligned}$$

121

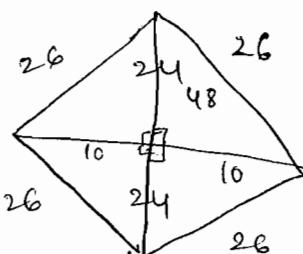


$$\text{Triplet} = (5, 12, 13)$$

$$\text{అంగ్మి} = \frac{1}{2} d_1 d_2 = \frac{1}{2} \times 24 \times 10 = 120$$

$$\text{అంగ్మి} = 4a = 4 \times 13 = 52$$

122



$$\text{అంగ్మి} = 20$$

① కొట్టమితి 90° తో వస్తువు అంగ్మి

$$② d_1^2 + d_2^2 = 4a^2$$

$$③ A = \frac{1}{2} d_1 d_2$$

$$(5 \times 12 = 13) \times 2$$

$$10 \times 24 = 26$$

$$\text{ప్రతిభాగం} = \frac{1}{2} d_1 d_2$$

$$= \frac{1}{2} \times \frac{24}{48} \times 20$$

$$= 480$$

(123)

వెదుట రెండు

$$d_1 : d_2 = \frac{4}{80} : \frac{5}{100} = 4 : 5$$

80%

వెదుట రెండు d<sub>1</sub> = 4, రెండు వక్క వెదుట రెండు d<sub>2</sub> = 5

రెండు వక్క వెదుట వ్యాసికి = K × రెండు ప్రతిభాగం

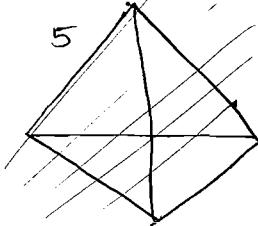
రాష్ట్ర ప్రతిభాగం = K రెండు × రెండు రెండు వ్యాసికి

$$\frac{1}{2} \times 4 \times 5 = K \times 5^2$$

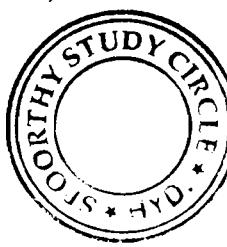
$$K = \frac{2}{5}$$

(124)

Typical Question



equal to 1

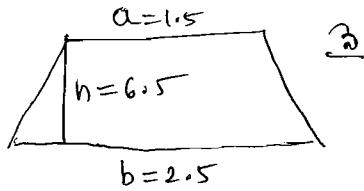


నక్క భూమిలైన రాష్ట్ర పరియుచున్నాం

ప్రతిభాగానమనం. వాటినిష్టతి = 1 : 1

(125)

Trapezium



$$a = 1.5$$

$$b = 2.5$$

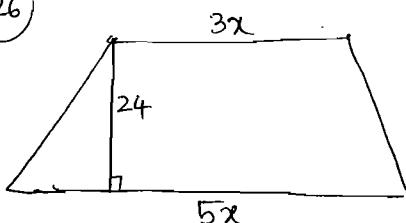
$$\text{ప్రతిభాగం} = \frac{1}{2} (a+b) h$$

$$\text{ప్రతిభాగం} = \frac{1}{2} (1.5 + 2.5) \times 6.5$$

$$= \frac{1}{2} \left( \frac{2}{7} \right) (6.5)$$

$$= 13$$

(126)



$$\text{ప్రతిభాగం} = \frac{1}{2} (a+b) h$$

$$1440 = \frac{1}{2} (3x+5x) \times 24$$

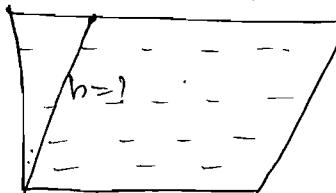
$$8x = 120$$

$$x = 15$$

$$\text{ప్రతిభాగం} = 5x = 5(15) = 75$$

(127)

$$b = 12 \text{ m}$$



$$a = 8 \text{ m}$$

$$\text{ప్రతిభాగం} = \frac{1}{2} (a+b) h$$

$$840 = \frac{1}{2} (8+12) \times h$$

$$840 = \frac{1}{2} (20) \times h$$

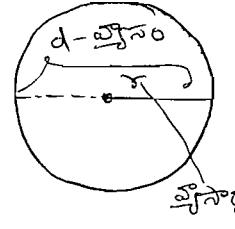
$$h = 84$$

\*\*\*

## CIRCLE (వృత్తం)

$$(1) \text{ వృత్త పరిధి} = 2\pi r = \pi d$$

$$(2) \text{ వృత్త ప్రతిభాగం} = \pi r^2$$

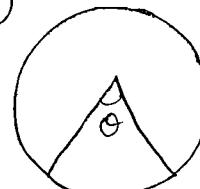


$$\text{వొఱమ} = \frac{\theta}{360} \times 2\pi r$$

$$360^\circ \rightarrow 2\pi r$$

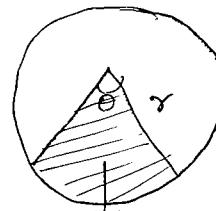
$$\theta \rightarrow ? \quad \theta = \frac{2\pi r}{360^\circ}$$

(3)



l-arc వొఱమ

(4)



Sector / సెక్టర్

$$\text{సెక్టర్ ప్రతిభాగం} = \frac{\theta}{360} \times \pi r^2$$

$$360^\circ \rightarrow \pi r^2$$

$$\theta \rightarrow ?$$

(5) Segment :



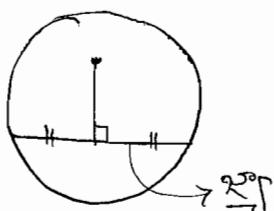
భూజి | Chord.

Segment

$$\text{Segment వాటవు} = \frac{\theta}{360} \times 2\pi r + \frac{r \cdot \sin \theta}{2}$$

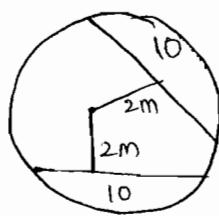
$$\text{Segment వైశాల్యం} = \frac{\theta}{360} \times \pi r^2 - \frac{1}{2} r^2 \sin \theta$$

6)



\* కొండుంసండి దైర్జిల్ గిన్  
లంబచీఫ్ లైన్ నమించు  
ఖండనం చేస్తుంది.

7)



\* నమినపాణపును దైర్జిల్ తోటు  
సంభిలించున దూరం ఉండుట.

28)

$$\begin{aligned} &= \frac{\text{వైశాల్యం}}{\text{వాటవు}} \times 100 \\ &= \frac{\pi r^2}{2\pi r} \times 100 \\ &= \frac{5}{2} \times \frac{50}{100} \\ &= 250\% \end{aligned}$$

129)

$$\begin{aligned} 1\text{-మిణ్టు వాటవు} &= \text{వృత్తప్రాంతి} = 2\pi r \\ &= 2\pi \times 50 \text{ m} \\ &= 100\pi \text{ m} \end{aligned}$$

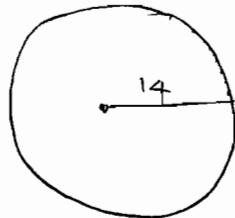
$$1\text{-మిణ్టు పెట్టుకాలం t} = \frac{d}{S} = \frac{100\pi \text{ m}}{\frac{10\pi}{18} \text{ m/sec}} = 30\pi \text{ sec}$$

$$\begin{aligned} 20\text{-మిణ్టు రెప్ప} &= 20 \times 30\pi \text{ sec} \\ &= 600\pi \text{ sec} \\ &= \frac{600\pi}{60} \text{ min} \\ &= 10\pi \text{ min} \\ &= 10(3.14) \text{ min} \\ &= 31.4 \text{ min} \end{aligned}$$

\*Imp.

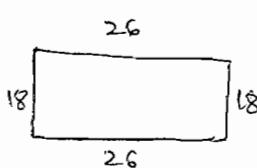
$$\pi \text{ విఱవ} = 3.14$$

(130)

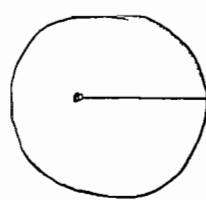


$$\begin{aligned} \text{వైశాల్యం} &= \pi r^2 \\ &= \frac{22}{7} \times 14 \times 14 \\ &= 616 \text{ చొఱగీ} \\ &= \frac{616 \times 1}{100} \\ &= 6.168 \text{ కోటి} \end{aligned}$$

(131)



$$\text{చొఱగీ} = 88$$



$$\text{చొఱగీ} = 88$$

$$\begin{aligned} 2\pi r &= 88 \\ \frac{2 \times 22}{7} \times r &= \frac{88}{7} \\ r &= 14 \end{aligned}$$

$$\begin{aligned} \text{వైశాల్యం} &= \pi r^2 \\ &= \frac{22}{7} \times 14 \times 14 \\ &= 616 \end{aligned}$$



(132)

$$\begin{aligned} \pi r^2 &= 24.64 \\ \frac{22}{7} \times r^2 &= \frac{24.64}{100} \end{aligned}$$

$$\begin{aligned} r^2 &= \frac{112 \times 7}{100} \\ r^2 &= \frac{4 \times 4 \times 7 \times 7}{100} \end{aligned}$$

$$r = \frac{4 \times 7}{10} = 2.8$$

$$\begin{aligned} \text{పాఠి} &= 2\pi r \\ &= 2 \times \frac{22}{7} \times 2.8 \\ &= 17.6 \end{aligned}$$

(133)

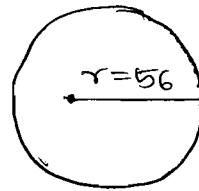
$$\begin{aligned} \text{పాఠి} &= \text{వైశాల్యం} \\ 2\pi r &= \pi r^2 \end{aligned}$$

$$r = 2$$

$$\begin{aligned} \text{రెప్పింగ్} d &= 2r \\ &= 2(2) \\ &= 4 \end{aligned}$$

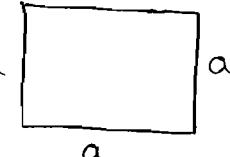
(134) వర్షా - వ్యవస్థ 0 = 37  
 $2\pi r - r = 37$   
 $2 \times \frac{22}{7} r - r = 37$   
 $\frac{44r - 7r}{7} = 37$   
 $\frac{37r}{7} = 37$   
 $\frac{37r}{r} = 7$   
 $\text{వ్యవస్థ} 0 = \pi r^2$   
 $= \frac{22}{7} \times 7 \times 7$   
 $= 154$

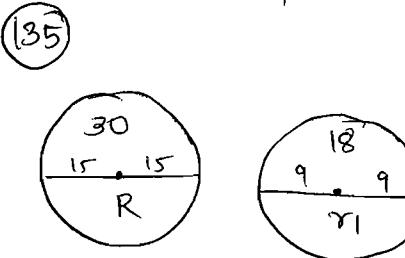
(137)



$\text{ఆశాధు} = \sqrt{\text{వ్యవస్థ}}$

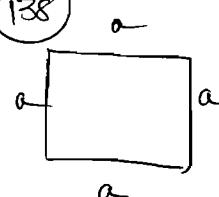
$= 2\pi r$   
 $= 2 \times \frac{22}{7} \times 56$   
 $= 352$

  
 $\text{ఆశాధు} / a = \frac{88}{352}$   
 $a = 88$   
 $\text{వర్షా వ్యవస్థ} 0 = a^2$   
 $= 88^2$   
 $= 7744 \text{ cm}^2$



$C \text{ వ్యవస్థ} 0 = A \text{ వ్యవస్థ} 0 + B \text{ వ్యవస్థ} 0$   
 $\pi R^2 = \pi r_1^2 + \pi r_2^2 \quad (\text{common triplets})$   
 $R^2 = r_1^2 + r_2^2$   
 $15^2 = r_1^2 + r_2^2$   
 $15^2 = 9^2 + r_2^2$   
 $9 \cdot 12 = 15$

(138)

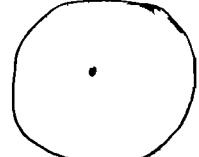


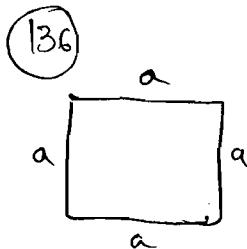
$\text{వ్యవస్థ} 0 = a^2$

$a^2 = 484$

$a = 22$

$\text{వర్షా} = 4a$   
 $= 4(22)$   
 $= 88$

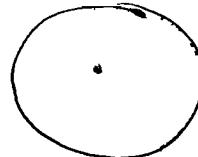
  
 $\text{వర్షా} / \text{వర్షా} = 88$   
 $2\pi r = 88$   
 $2 \times \frac{22}{7} \times r = 88$   
 $r = 14$   
 $\text{వ్యవస్థ} 0 = \pi r^2$   
 $= \frac{22}{7} \times 14 \times 14$   
 $= 616$



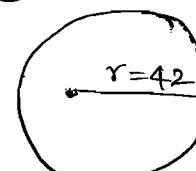
$\text{వర్షా} = 44$

$A/a = 44$   
 $a = 11$

$B \text{ వ్యవస్థ} 0 = a^2$   
 $= 11^2$   
 $= 121$

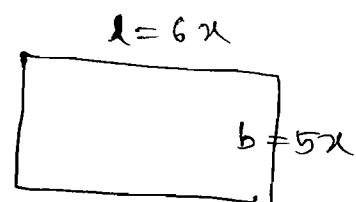
  
 $\text{వర్షా} = \sqrt{\text{వర్షా}} = 44$   
 $= 2\pi r = 44$   
 $2 \times \frac{22}{7} \times r = 44$   
 $r = 7$   
 $\text{వ్యవస్థ} 0 = \pi r^2$   
 $= \frac{22}{7} \times 7 \times 7$   
 $= 154$

(139)



$\text{వర్షా} = \text{వర్షా}$   
 $= 2\pi r$   
 $= 2 \times \frac{22}{7} \times 42$   
 $= 2 \times 22 \times 6$

$\text{వర్షా} = 5x = 5 \times 12 = 60$



$\text{వర్షా} = 2(l+b)$   
 $2 \times 22 \times 6 = 2(6x+5x)$   
 $22 \times 6 = 22x$   
 $x = 12$

(140)

$\text{వ్యవస్థ} 0 \text{ వ్యవస్థ} 0 = \text{సేలంగి} + \text{చెరువు}$   
 $= 40,000 + 180 \times 120$   
 $= 40,000 + 21600$

$$\pi r^2 = 61600$$

$$\frac{2800}{5600}$$

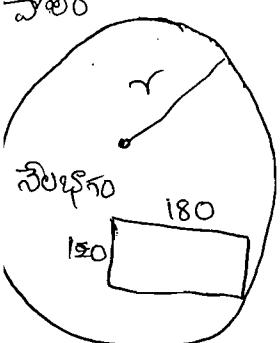
$$22 \times r^2 = 61600$$

7

$$r^2 = 7 \times (1 \times 2 \times 2) \times 10 \times 10$$

$$r = 7 \times 2 \times 10$$

$$r = 140 \text{ m}$$



$$\frac{\text{O వ్యాస}}{\square \text{ వ్యాస}} = \frac{\pi r^2}{a^2}$$

$$= \frac{\pi \times \frac{2}{7} \times \frac{2}{7}}{\pi \times \frac{2}{7} \times \frac{2}{7}}$$

$$= \frac{4}{\pi}$$

$$= \frac{2 \times 4}{2 \times 11} \Rightarrow \frac{14}{11}$$

$$= 14 : 11$$

$$\frac{A_1}{A_2} = \frac{\pi r_1^2}{\pi r_2^2}$$

$$\frac{16}{49} = \frac{r_1^2}{r_2^2} \Rightarrow r_1^2 = 16 \times 4$$

$$r_1^2 = 64 \Rightarrow r_1 = \sqrt{64}$$

$$r_1 = 8$$

142

$$\text{కొత్త నొప్పటి} \quad \frac{A_1}{A_2} = \frac{\pi r_1^2}{\pi r_2^2}$$

$$\frac{4}{9} = \frac{r_1^2}{r_2^2}$$

$$\frac{r_1}{r_2} = \frac{2}{3}$$

$$\text{వంధుల నొప్పటి} = \frac{2\pi r_1}{2\pi r_2} \Rightarrow \frac{r_1}{r_2} \Rightarrow \frac{2}{3}$$

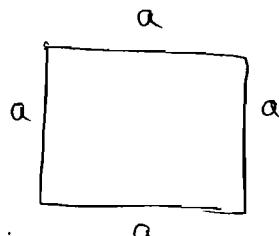
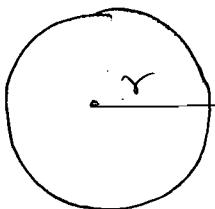
~~143~~

$$\text{కొత్త నొప్పటి} =$$

$$(\text{వ్యాసం నొప్పటి} = \text{వ్యాసం నొప్పటి} = \text{పరిధి నొప్పటి})^2$$

\* ఈ ప్రత్తోస్తి నంబండించిన Terms

43)



ముఖ్యముగా = ముఖ్యముగా

$$2\pi r = 4a$$

$$\frac{r}{a} = \frac{4^2}{2\pi} = \frac{4}{\pi}$$

$$\frac{\text{O వ్యాస}}{\square \text{ వ్యాస}} = \frac{\pi r^2}{a^2}$$

$$= \frac{\pi \times \frac{2}{7} \times \frac{2}{7}}{\pi \times \frac{2}{7} \times \frac{2}{7}}$$

$$= \frac{4}{\pi}$$

$$= \frac{2 \times 4}{2 \times 11} \Rightarrow \frac{14}{11}$$

$$= 14 : 11$$

144

$$\text{వ్యాసం } d = 1.26 \text{ m}$$

$$\text{వ్యాసం } r = 0.63 \text{ m}$$

$$1 \text{ సాంచ చక్కంతించి అంపణించుట } = 2\pi r$$

$$= 2 \times \frac{22}{7} \times 0.63^{0.09}$$

$$500 \text{ సాంచ తిథిగా దూరం } = 500 \times 2 \times 22 \times 0.09 \\ = 1980$$

145

$$\text{వ్యాసం } d = 40 \text{ cm}$$

$$\text{వ్యాసం } r = 20 \text{ cm}$$

$$1 \text{ సాంచ చక్కంతించి అంపణించుట } = 2\pi r \\ = 2\pi \times 20 \\ = 40\pi \text{ cm}$$

$$\text{బసిం వెళుళు } = \frac{\text{బసిం దూరం}}{1 \text{ బసిం దూరం}}$$

$$= \frac{176 \times 100 \text{ cm}}{40\pi}$$

$$= \frac{176 \times 100 \times 7}{40 \times 22} = 140$$

146

$$\text{వ్యాసం } r = 0.25 \text{ m}$$

$$1 \text{ సాంచ తిథిగా అంపణించుట } = 2\pi r \\ = 2\pi \times 0.25 \text{ m} \\ = 0.5\pi \text{ m}$$

$$\begin{aligned}
 \text{వస్తువు వర్ణాల} &= \frac{\text{మొత్తం దూరం}}{1\text{అవస్థనిఃదూరం}} \\
 &= \frac{11 \times 1000}{0.5 \times \pi} \\
 &= \frac{\pi \times 1000}{\frac{1}{2} \times \frac{22}{7}} \\
 &= 7000
 \end{aligned}$$

(147)

$$\begin{aligned}
 r &= 7\frac{1}{2} \text{ m} = \frac{15}{2} \text{ m} \\
 \text{1 సంతోషించే పరిధి} &= 2\pi r \\
 &= 2\pi \times \frac{15}{2} \\
 &= 15\pi \text{ m}
 \end{aligned}$$

$$\begin{aligned}
 \text{1 సాయి వర్ణా} &= 7 \times 15\pi \\
 &= 105\pi \text{ m}
 \end{aligned}$$

$$\begin{aligned}
 \text{వీగొ} &= \frac{\text{దూరం}}{\text{సాయి}} \\
 &= \frac{7 \times 15\pi}{9} \text{ m/s} \\
 &= \frac{7 \times 15\pi}{9} \times \frac{18}{5} \text{ K/h} \\
 &= 42\pi \\
 &= 42 \times \frac{22}{7} \\
 &= 132 \text{ K/h.}
 \end{aligned}$$

$$\begin{aligned}
 (148) \quad \text{వైస్సా} d &= 70 \text{ cm} \\
 \text{వైస్సా రూప} &= 35 \text{ cm}
 \end{aligned}$$

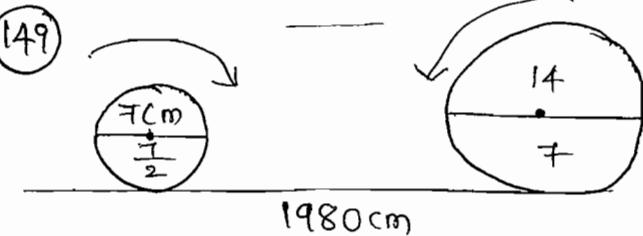
$$\begin{aligned}
 \text{1 సంతోషించే, దూరం} &= 2\pi r \\
 &= 2\pi \times 35 \text{ cm} \\
 &= 70\pi \text{ cm}
 \end{aligned}$$

$$\text{40 సాయి తిథిగతి అణవోయి దూరం} = 40 \times 70\pi \text{ cm}$$

$$\begin{aligned}
 \text{సాయి వర్ణా} &= 2800\pi \text{ cm} \\
 \text{సాయి వర్ణా} &= 28\pi \text{ m}
 \end{aligned}$$

$$\begin{aligned}
 \text{వీగొ} &= \frac{\text{దూరం}}{\text{సాయి}} = \frac{28\pi}{10} \text{ m/s} \\
 &= \frac{28 \times \frac{22}{7}}{10} \times \frac{18}{5} \text{ K/h} \\
 &= \frac{44 \times 18}{25} \text{ K/h } \left( \times \frac{4}{4} \right) \\
 &= 31.68 \text{ K/h.}
 \end{aligned}$$

(149)



1 సంతోషించే

$$\text{దూరం} = 2\pi r$$

$$= 2\pi \times \frac{7}{2}$$

$$= 7\pi$$

1 సంకుటి గాసాయి

ధ్వనినుపు.

$$\text{దూరం} = 7\pi \text{ cm}$$

$$10\pi \text{ m} = 7\pi \times 10$$

$$= 70\pi \text{ m}$$

$$\Rightarrow 70\pi + 140\pi = 1980 \text{ cm}$$

$$210\pi = 1980$$

$$\frac{210 \times \frac{22}{7}}{7} = \frac{18 \times 3}{1}$$

$$\pi = 3$$

$$1 \text{ సంకుటి గాసాయి దూరం} = 7\pi \text{ m}$$

$$= 7 \times \frac{22}{7} \times 3$$

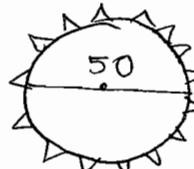
$$21 \text{ సంకుటి దూరం} = 66 \text{ m}$$

$$3 \text{ సంకుటి} = 66 \text{ cm}$$

$$1 \text{ సంకుటి} = 22 \text{ cm}$$

$$\text{వీగొ} = 22 \text{ cm/sec.}$$

(150)



$$\begin{aligned}
 \text{చుట్టూ} &= \pi d \\
 &= 50\pi
 \end{aligned}$$

ఎద్దు

$$\text{మొత్తం దూరం} = \text{మొత్తం దూరం}$$

$$\begin{aligned}
 \text{చుట్టూ} \times \text{ప్రతిచంపు దూరం} &= \text{చుట్టూ} \times \text{త్రణి} \\
 &= \text{చుట్టూ} \times \text{ప్రాణి దూరం}
 \end{aligned}$$

$$\begin{aligned}
 \text{చుట్టూ} &= \pi d \\
 &= 30\pi
 \end{aligned}$$

ఎస్సె

$$15 \times \frac{25}{50\pi} = x \times \frac{30}{30\pi}$$

$$x = 25$$

**OR** చీరు chain Rule లోనే చేసి.

ప్రస్తుతం

$$\text{పెద్ద} \rightarrow 50 \quad \text{15 మీటర్లు}$$

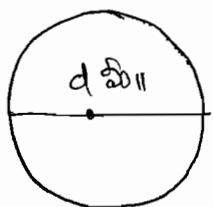
$$\text{అర్ధ} \rightarrow 30 \quad ? \quad \text{వర్షావు}$$

మనం వర్షావు నుండు ఉన్నాయి అనుకొనుట.

$$= \frac{\text{వర్షావు}}{\text{తెగ్గివు}} \times \text{దీని విలావు}$$

$$= \frac{50}{30} \times 15 \Rightarrow 25$$

151



$$1\text{ కిలోమీటర్} = \pi d$$

$$113\text{ స్క్రో దూరం} = 113\pi d \text{ మీ}$$

$$113\pi d \text{ మీ} = 21\text{ కి} + 26\text{ డిస్టాంచెంట్$$

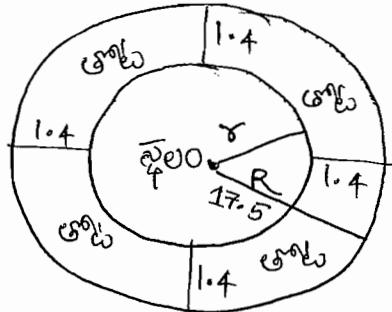
$$113\pi d \text{ మీ} = 2000\text{ కి} + 260\text{ మీ}$$

$$\cancel{113} \times \frac{22}{7} \times d = \cancel{22} \frac{20}{10} 60 \text{ మీ}$$

$$d = \frac{10}{11}$$

$$d = 6 \frac{4}{11}$$

153



$$\text{ప్రస్తుతం} = 35$$

$$R \text{ ప్రస్తుతం} = \frac{35}{\cancel{22}} = 17.5$$

$$r = 17.5 - 1.4$$

$$r = 16.1$$

$$\text{తోట} = \text{బయట} \ominus \text{లోపణ} \ominus$$

$$= \pi R^2 - \pi r^2$$

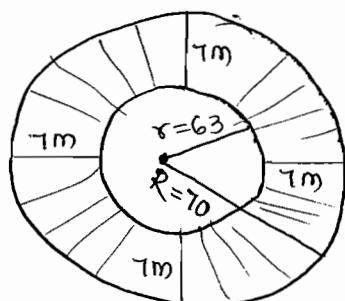
$$= \pi(R+r)(R-r)$$

$$= \pi(33.6)(1.4)$$

$$= \frac{22}{7}(33.6)(1.4)$$

$$= 147.84$$

154



$$2\pi R = 440$$

$$\cancel{2} \times \frac{22}{7} \times R = \cancel{44} 0$$

$$R = 70$$

$$\text{తోట} = \text{బయట} \ominus \text{లోపణ} \ominus$$

$$= \pi R^2 - \pi r^2$$

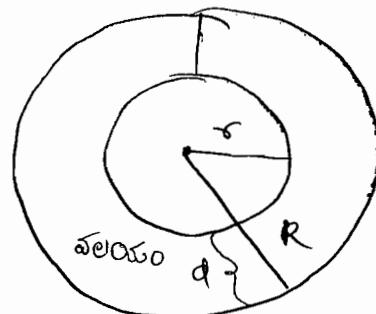
$$= \pi(R+r)(R-r)$$

$$= \frac{22}{7}(133) \cancel{(7)}$$

$$= 2926$$



155



$$\pi R^2 = 616$$

$$\cancel{22} \frac{R^2}{7} = \cancel{61} 6$$

$$R^2 = 7 \times 28$$

$$R^2 = 7 \times 7 \times 2 \times 2$$

$$R = 7 \times 2 = 14$$

$$\pi r^2 = 154$$

$$\cancel{22} \frac{r^2}{7} = \cancel{15} 4$$

$$r^2 = 7 \times 7$$

$$r = 7$$

$$d = R - r \\ = 14 - 7 \\ = 7$$

$$\text{ప్రథమ} = 2\pi$$

$$= (x+10) \text{ మీటర్లు}$$

$$\text{ప్రథమ} = (x+10) 2\pi$$

$$\text{ప్రథమ} = 30 \text{ తుండ్ర దూరం}$$

$$2\pi(x+10) = 3\pi x$$

$$2x+20 = 3x$$

$$x = 20$$

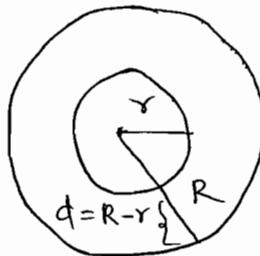
$$\text{ప్రథమ} = 3\pi x$$

$$= 3\pi \times 20$$

$$= 60\pi$$

156

$$2\pi R - 2\pi r = 132$$



$$2\pi(R-r) = 132$$

$$2 \times \frac{22}{7} (R-r) = 132$$

$$R-r = 21$$

$$d = R-r \Rightarrow 21$$

157

$$\text{వీటి బండర్} = 200\pi r^2 - \text{అంధారమి}$$

$$\frac{11}{25} \times \pi R^2 = \pi(R+4)^2 - \pi R^2$$

$$\frac{11}{25} R^2 = R^2 + 8R + 16 - R^2$$

$$11R^2 = 200R + 400$$

C  $11(400) = 4000 + 400$   
  $4400 = 4400$

D  $11(900) = 4000 + 400$   
  $9900 = 4400$

158

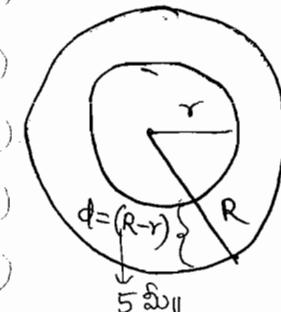
$$\frac{2\pi R}{2\pi r} = \frac{23}{22}$$

$$R:r = 23:22$$

లేకఁ = 1

$$1 \rightarrow 5\text{మీ}?$$

$$22 \rightarrow 110$$



$$\text{వీటి} = 2\pi = 2(110) \Rightarrow 220$$

**SEMICIRCLE**  
**అంధవృత్తం**



(1) **అంధవృత్త ప్రాచుర్యం** =  $\frac{\pi r^2}{2}$

(2) **పుత్తంపది** =  $\pi r + 2r = \frac{36}{7} r$

159 **అంధవృత్త ప్రాచుర్యం** =  $\frac{\pi r^2}{2}$

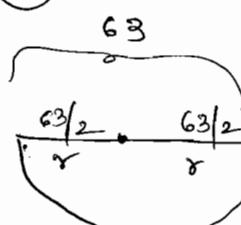
$$\pi r = 14$$

$$\pi r = 7$$

$$= \frac{1}{2} \times \frac{22}{7} \times 1 \times 7$$

$$= 77$$

160



$$\text{మీ.టి.పి.} = \pi r + 2r$$

$$= \frac{22}{7} \times \frac{63}{2} + 63$$

$$= 99 + 63$$

$$= 162$$

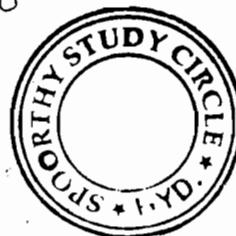
161

$$\text{అంధవృత్త పది} = \pi r + 2r = 36$$

$$= \frac{22}{7} r + 2r = 36$$

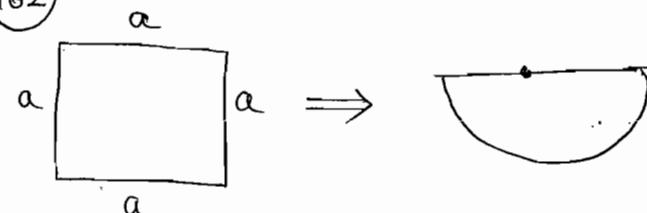
$$\frac{36r}{7} = 36$$

$$r = 7$$



$$\text{ప్రాచుర్యం} = \frac{\pi r^2}{2} = \frac{1}{2} \times \frac{22}{7} \times 1 \times 7 \Rightarrow 77$$

162



$$\text{ప్రాచుర్యం} = a^2 = 81$$

$$a = 9$$

$$\text{మీ.టి.పి.} = 4a$$

$$= 4 \times 9$$

$$= 36$$

$$\text{మీ.టి.పి.} = 36$$

$$\pi r + 2r = 36$$

$$\frac{22}{7} r + 2r = 36$$

$$\frac{36r}{7} = 36$$

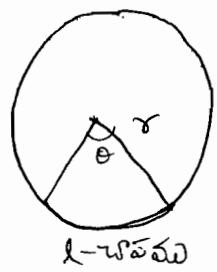
$$r = 7$$

$$\text{ప్రాచుర్యం} = \frac{\pi r^2}{2}$$

$$= \frac{1}{2} \times \frac{22}{7} \times 1 \times 7$$

$$= 77$$

చూపము (Arc):



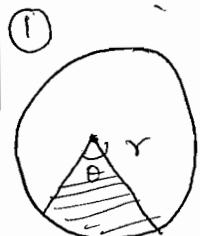
$$360^\circ \rightarrow 2\pi r$$

$$\theta^\circ \rightarrow ?$$

$$\frac{\theta}{360^\circ} \times 2\pi r$$

$$l = \frac{\theta}{360} \times 2\pi r$$

Sector:-

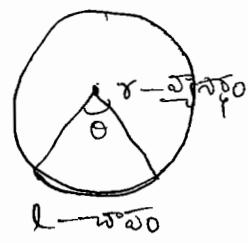


$$360^\circ \rightarrow \pi r^2$$

$$\theta = ?$$

$$\text{స్కెట్ వైట్ } = \frac{\theta}{360} \times \pi r^2$$

(2)

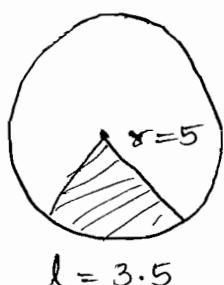


$$\begin{aligned}\text{వాయి} &= \frac{1}{2} \times l \times r \\ &= \frac{1}{2} \times 2\pi r \times \text{వైట్}\end{aligned}$$

\*\*\*

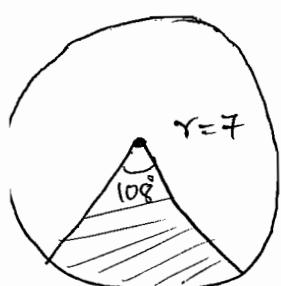
(63)

$$\begin{aligned}\text{స్కెట్ వైట్ } &= \frac{1}{2} \times l \times r \\ &= \frac{1}{2} \times 3.5 \times 5^{2.5} \\ &= 8.75\end{aligned}$$



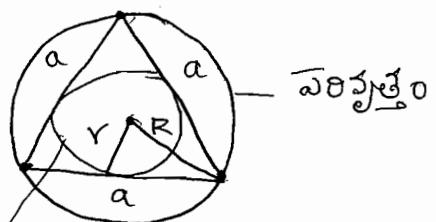
(64)

$$\begin{aligned}\text{స్కెట్ వైట్ } &= \frac{\theta}{360} \times \pi r^2 \\ &= \frac{3}{360} \times \frac{22}{7} \times 7^2 \\ &= 46.2\end{aligned}$$



\*\*\*

① సమచావలు:



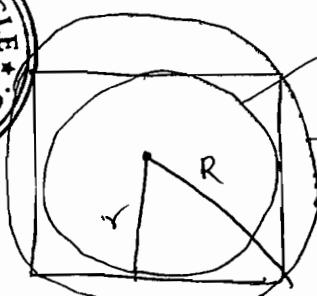
అంతరవ్యత్థం

$$* \text{ పరిపుత్త వ్యాసం } R = \frac{a}{\sqrt{3}}$$

$$* \text{ అంతరవ్యత్థ వ్యాసం } r = \frac{a}{2\sqrt{3}}$$

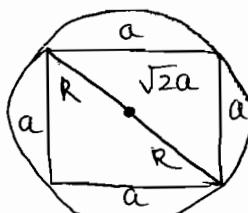
$$R:r = 2:1$$

② ఒడులురణు:



అంతరవ్యత్థం  
పరిపుత్త

(A)



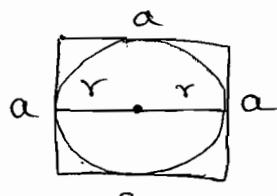
వ్యాస = ఒడులురణు

$$2R = \sqrt{2}a$$

$$R = \frac{\sqrt{2}}{2}a$$

$$R = \frac{a}{\sqrt{2}}$$

(B)



వ్యాస = ఒడులురణు

$$2r = a$$

$$r = \frac{a}{2}$$

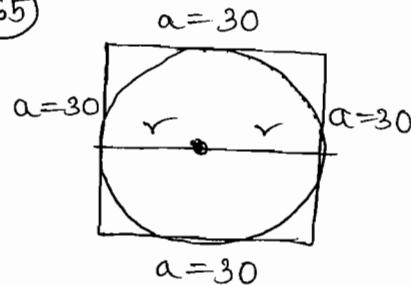
$$R:r = \frac{a}{\sqrt{2}} : \frac{a}{2}$$

$$= \frac{1 \cdot \frac{1}{\sqrt{2}}}{\frac{1}{2}} : \frac{\sqrt{2}a}{2}$$

$$R:r = \frac{a}{\sqrt{2}}$$

\*\*\*

(165)



$$\text{వీ.సి} \quad a = \sqrt{2}r$$

a = 30

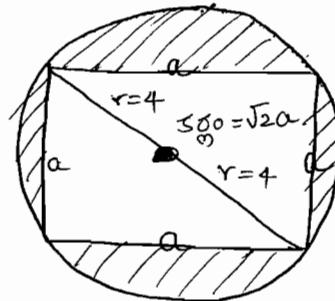
$$2r = a$$

$$2r = 30$$

$$r = 15$$

$$\begin{aligned} \text{ప్రాణి} &= \pi r^2 \\ &= \frac{22}{7} (15)^2 \end{aligned}$$

(168)



$$\sqrt{2}a = 8$$

$$a = \frac{8}{\sqrt{2}} = \frac{2 \times 4}{\sqrt{2}} = 4\sqrt{2}$$

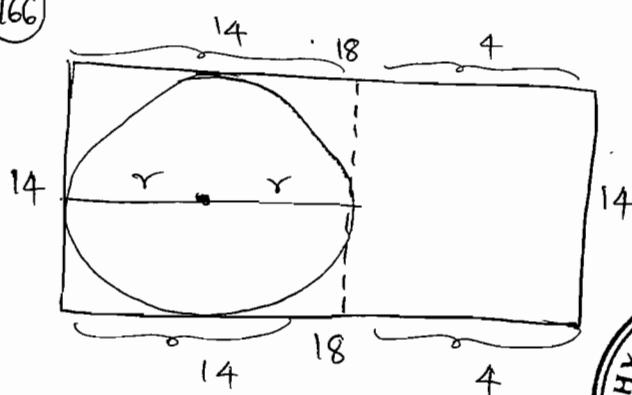
$$\text{కొణుస్తోటు} = \textcircled{1} - \square$$

$$= \pi r^2 - a^2$$

$$= \pi \times (4)^2 - (4\sqrt{2})^2$$

$$= 16\pi - 32$$

(166)



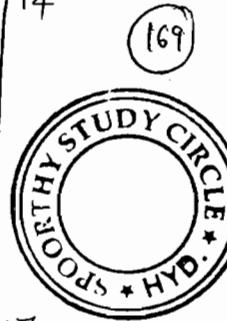
$$2r = 14$$

$$r = 7$$

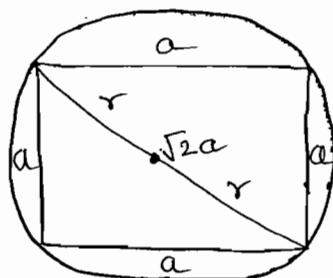
$$\text{ప్రాణి} = \pi r^2$$

$$= \frac{22}{7} \times 7 \times 7$$

$$= 154 \text{ cm}^2$$



(167)



$$\text{వీత ప్రాణి} = \pi r^2 = 220$$

$$\frac{22}{7} \times r^2 = 220$$

$$r^2 = 70$$

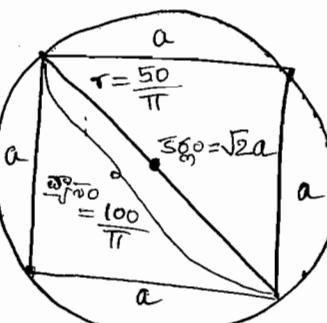
$$\text{వీత వ్యాస} = \text{చక్కనిందులు}$$

$$2r = \sqrt{2}a$$

$$a = \frac{2r}{\sqrt{2}} = \sqrt{2}r$$

$$\begin{aligned} \text{వీ.సి} &= a^2 \\ &= (\sqrt{2} \cdot r)^2 \\ &= 2 \cdot r^2 \\ &= 2 \times 70 \\ &= 140 \end{aligned}$$

(169)



$$\text{వీత వ్యాస} = 2\pi r = 100$$

$$r = \frac{50}{\pi}$$

$$d = \frac{100}{\pi}$$

$$\text{వీత వ్యాస} = \text{చక్కనిందులు}$$

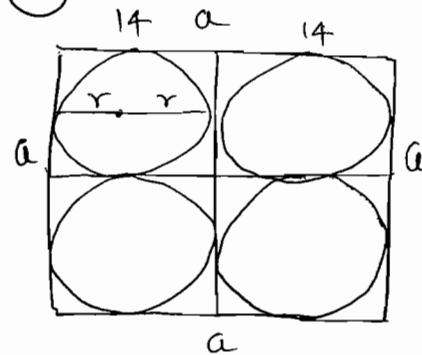
$$\frac{100}{\pi} = \sqrt{2} \cdot a$$

$$a = \frac{1}{\sqrt{2}} \times \frac{100}{\pi}$$

$$a = \frac{1}{\sqrt{2}} \times \frac{2 \times 50}{\pi}$$

$$a = \frac{50\sqrt{2}}{\pi}$$

(170)



$$\text{ప్రాణి} = a^2 = 184$$

$$a = 28$$

$$\begin{aligned} 4r &= 14 \\ r &= 7 \end{aligned}$$

$$\begin{aligned} \text{వీ.సి} &= 2\pi r \\ &= 2 \times \frac{22}{7} \times 7 \\ &= 44 \end{aligned}$$

$$\begin{aligned} \text{కొడు వీయల్పున నిర్మిత్తం } &= 4\pi r \\ &= 4 \times \frac{22}{7} \times \cancel{\frac{3}{2}} \\ &= 132 \text{ m} \end{aligned}$$

$$\underline{\text{P}03} = \cancel{132} \times \frac{25}{\cancel{2}} \text{ RS}$$

$$= 1650 \text{ RS}$$



A diagram showing a circle inscribed within a triangle. The circle touches all three sides of the triangle at points equidistant from the vertices.

$$\frac{\textcircled{1} \text{ ഉണ്ട് പ്രക്രിയയോ}}{\textcircled{2} \text{ വർദ്ധിച്ച പ്രക്രിയയോ}} = \frac{\pi r^2}{\pi R^2} = (1:2)^2 = 1:4$$

$$\text{Q3) నమునాలు \textcircled{R} \text{ముందు} R = \frac{a}{\sqrt{3}}$$

$$\text{వాస్తు వ్యాసం } R = \frac{12}{\sqrt{3}}$$

$$= \frac{3 \times 4}{\sqrt{3}}$$

$$R = 4\sqrt{3}$$

$$\text{సమాఖ్యక ప్రాథమిక లింగం వ్యతిశ్యామ} = \frac{a}{2\sqrt{3}}$$

$$\begin{aligned} \text{圆的面积} &= \pi r^2 \\ &= \frac{22}{7} \times \sqrt{3} \times \sqrt{3} \\ &= 22 \times 3 \times 1 \\ &= 46.2 \end{aligned}$$

$$r = \frac{42^{21}}{2\sqrt{3}}$$

175

నమచాత్మకియుండి పొత్రవ్వత్త రాజులు  $\alpha = \frac{a}{2\sqrt{3}}$

$$\frac{22}{7} \times r^2 = 154$$

$$r^2 = 49$$

$$r = 7$$

$$\begin{aligned}
 \text{व्यास} &= 30 \\
 &= 3 \times 14\sqrt{3} \\
 &= 42\sqrt{3} \\
 &= 42(1.732) \\
 &= 72.744
 \end{aligned}$$

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

$$= \frac{6+a+a/11}{2}$$

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

$$S = 16$$

$$\Delta \text{ 三五零} = \Delta \text{ 三五零}$$


---


$$s(s-a)(s-b)(s-c) = r \times s$$


---


$$6(16-6)(16-11)(16-15) = r \times 1$$


---


$$\therefore (10)(5)(1) = r \times 16$$


---


$$\times 5\sqrt{2} = r \times \frac{4}{16}$$


---


$$r = \frac{5\sqrt{2}}{4}$$

四

$$\begin{array}{|c|c|} \hline \text{ஒள்ளுத்தெரிவு} = 2\pi r = 88 & \text{நூல்கள்} = 30 \\ \underline{\underline{= 2 \times \frac{22}{7} \times r = 88}} & \text{ஏஞ்சாளி} = 15 \\ & \\ & r = 14 \\ \hline \end{array}$$

$$\begin{aligned}4 \text{ ପରାମ୍ପରା } &= 7 \times 5 \\&= 14 \times 15 \\&= 210\end{aligned}$$

178

$$\Delta \tilde{\text{தெரு}} = x.$$

$$S = \text{သုတေသန} = \frac{x}{2}$$

179

సమస్యలు కొనుతాడన్నాడు అన్నాడో,

చతురస్రం, వృత్తం లలిత్తాస్తి ఎటువ, వృత్తం

కంటే చతురస్రాస్తి తయావ, చతురస్రం కంటే

అధ్యాస్తి ఇంకా తయావ ప్రశ్నలు ఉంటాయి.

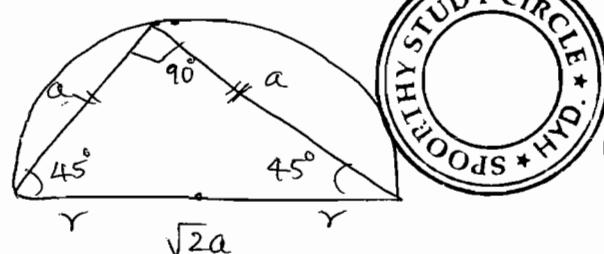
C ప్రశ్నా > S ప్రశ్న > T ప్రశ్న

180

NOTE 2: ప్రశ్నలు నమం అయినప్పుడు  
చంపుకొనుతాడన్నాస్తి ఎటువ, చతురస్రాస్తి నీకి కొనిపెంతయావ, వృత్తాస్తి ఇంకా తయావగా  
చేయాలి.  
\* ప్రశ్నలు నమం అయితే...

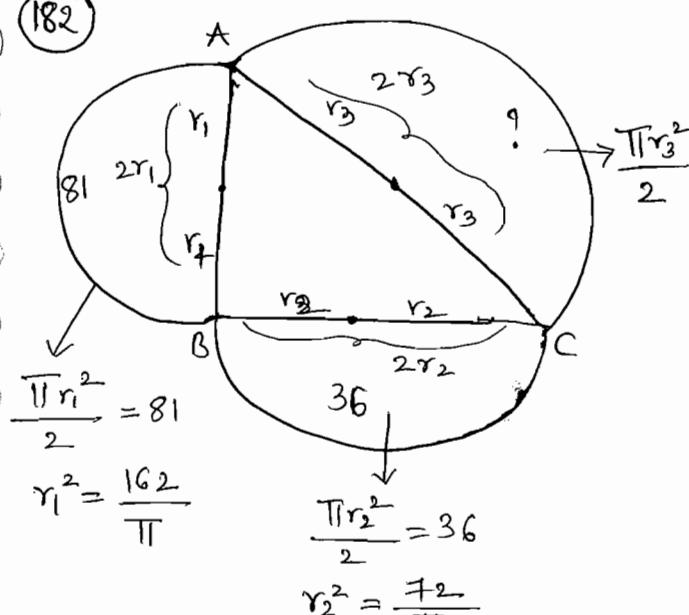
△ చుట్టీ > □ చుట్టీ > ○ చుట్టీ

181



$$\Delta \text{ ప్రశ్నా } = \frac{1}{2} \times a \times a \\ = \frac{1}{2} \times (\frac{\sqrt{2}}{2} r)^2 \\ = r^2$$

182



$$\text{ప్రశ్నా } \Delta = \frac{\pi r_3^2}{2} = \text{భూమి} + \text{వ్యత్తి}^2$$

$$= (2r_3)^2 = (2r_1)^2 + (2r_2)^2$$

$$r_3^2 = r_1^2 + r_2^2$$

$$= \frac{162}{\pi} + \frac{72}{\pi}$$

$$r_3^2 = \frac{234}{\pi}$$

$$\frac{\pi r_3^2}{2} = \frac{117}{\pi}$$

$$r_3^2 = 117$$

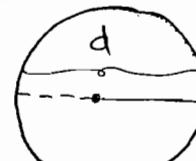
$$183 \quad \text{వ్యత్తా } r = 75\% \uparrow$$

$$\text{ఏది} = 2\pi r (75\% \uparrow)$$

$$\text{ప్రశ్నా} = \pi r^2 \rightarrow 2 \frac{\pi r^2}{3}$$

$$\text{ప్రశ్నాపుట్టి} = a + b + \frac{ab}{100} \\ = 75 + 75 + \frac{75 \times 75}{100}$$

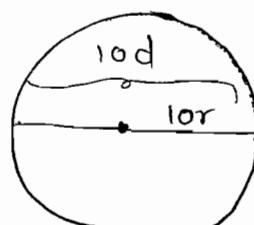
184



$$\text{చుట్టీ} = \pi d$$

$$\frac{1}{2} \text{సెఱ్లు} \rightarrow 40\% \uparrow$$

$$1 \text{సెఱ్} \rightarrow ? 5\% \uparrow$$



$$\text{చుట్టీ} = \pi (10d)$$

$$= 10\pi d$$

$$1 \text{సెఱ్} = 10 \times 5\% \uparrow \\ = 50\% \uparrow$$

185

$$\text{ప్రశ్నాపుట్టి} = \frac{\pi r^2}{2} \rightarrow 2 \frac{\pi r^2}{3}$$

$$\text{ప్రశ్నాపుట్టి} = a + b + \frac{ab}{100}$$

$$6\% \uparrow 6\% \uparrow = 6 + 6 + \frac{6 \times 6}{100}$$

$$= 12 + 0.36$$

$$= 12.36\% \uparrow$$

$$\text{ప్రశ్న} = 12.36\% \uparrow$$

186

10% ↓

$$a = -10, b = -10$$

$$\begin{aligned} \text{ప్రతిశ్రుతి మర్యాద} &= a+b+\frac{ab}{100} \\ &= -10-10+\frac{-10 \times -10}{100} \\ &= -20+1 \\ &= -19 \\ &= 19\% \downarrow \end{aligned}$$

187

$$\begin{aligned} \text{వ్యవస్థాంపెట్టుటి} &= 100 \\ &\quad \nearrow 200 \\ &\quad \uparrow 100\% \\ a &= +100\% \\ b &= +100 \end{aligned}$$

$$\begin{aligned} \text{ప్రతిశ్రుతి మర్యాద} &= a+b+\frac{ab}{100} \\ &= 100+100+\frac{100 \times 100}{100} \\ &= 300\% \uparrow \end{aligned}$$

ప్రతిశ్రుతి = 300% వచ్చింది

$$\text{ప్రతిశ్రుతి కొన్ఱెత్తుతో ప్రతిశ్రుతి} = 100\% + 300\% = 400\%$$

188

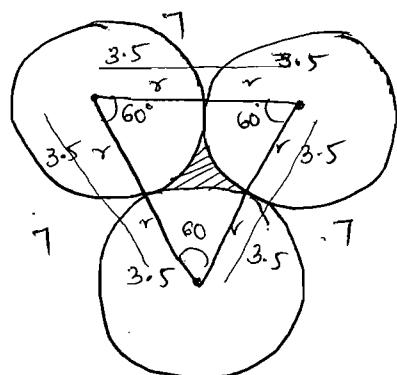
పంచి | వ్యవస్థా | వ్యవస్థా

$$\begin{aligned} \text{ప్రతిశ్రుతి మర్యాద} &= a+b+\frac{ab}{100} \\ &= 100+100+\frac{100 \times 100}{100} \\ &= 300\% \text{ కి అనుమతి } 300\% \text{ వచ్చింది} \end{aligned}$$

$$\text{మొత్త ప్రతిశ్రుతి} = 100\% + 300\% = 400\%$$

ప్రతిశ్రుతి = 4 రెట్లు (in quadruples.)

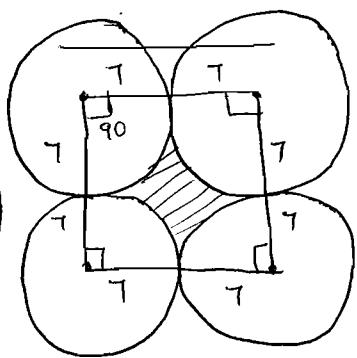
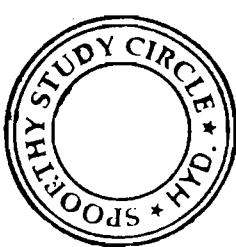
89)



కోణి = నమిషణ ఆ - 3 x సిక్కుకుటి ||

$$\begin{aligned} &= \frac{\sqrt{3}}{4} a^2 - 3 \times \frac{\theta}{360} \times \pi r^2 \\ &= \frac{\sqrt{3}}{4} \times 7^2 - 3 \times \frac{60}{360} \times \frac{22}{7} \times \frac{1}{2} \times \frac{1}{2} \times 7^2 \\ &= \end{aligned}$$

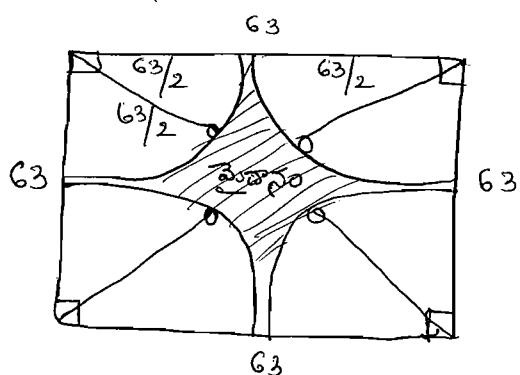
190



కోణి = □ - 4 x సిక్కుకుటి

$$\begin{aligned} &= 14^2 - 4 \times \frac{90}{360} \times \frac{22}{7} \times 7 \times 7 \\ &= 196 - 154 \\ &= 42 \end{aligned}$$

191



కోణిన ప్రతిశ్రుతి = □ 3 II - 4 x సిక్కుకుటి

$$\begin{aligned} &= 63^2 - 4 \times \frac{90}{360} \times \frac{22}{7} \times \frac{63}{2} \times \frac{63}{2} \\ &= \end{aligned}$$

$$\begin{aligned} &= 63 \left( 63 - \frac{99}{2} \right) \\ &= 63 \left( \frac{27}{2} \right) \\ &= \frac{1701}{2} \end{aligned}$$

$$= 850.5$$

# VOLUMES

ఘనవర్షాంగాలు

## ① Cuboid (టిఫ్ఫ్యూషన్ వర్షాంగాలు):

$$1. \text{ గం } 4 \text{ చీడల ప్రెస్టాగ్ } (\text{లోకణల ప్రెస్టాగ్}) = 2h(1+b)$$

$$2. \text{ గం సంఖ్యల ప్రెస్టాగ్ } = 2(lb + bh + lh)$$

$$3. \text{ గం ఘనపరిమాణం } = lbh \quad (\text{పేదా}) \\ = \text{ Area of floor} \times h$$

$$4. \text{ రిషికర్త వ్యాస } (d) = \sqrt{l^2 + b^2 + h^2}$$

## ② CUBE (ఘనవర్షాంగాలు):

$$1. \text{ గం } 4 \text{ చీడల ప్రెస్టాగ్ } (\text{లోకణల ప్రెస్టాగ్}) = 4a^2$$

$$2. \text{ గం సంఖ్యల ప్రెస్టాగ్ } = 6a^2$$

$$3. \text{ గం ఘనపరిమాణం } = a^3$$

$$4. \text{ గం రెండ్రము } d = \sqrt{3} \cdot a$$

## ③ Prism (ప్రిసమ్):

$$1. \text{ లోకణల / వర్గణల ప్రెస్టాగ్ }$$

= భూమి - ముట్టుకొలత  $\times$  ఎత్తు

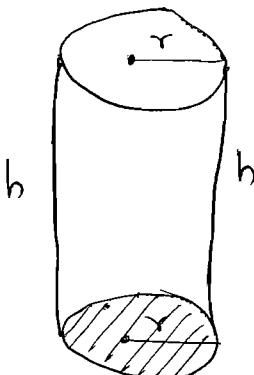
$$2. \text{ సంఖ్యల ప్రెస్టాగ్ } =$$

= L.S.A + top + bottom

$$3. \text{ ఘనపరిమాణం } = \text{ భూమి ప్రెస్టాగ్ } \times \text{ ఎత్తు }.$$

Examples to Prism

I). లూపం:



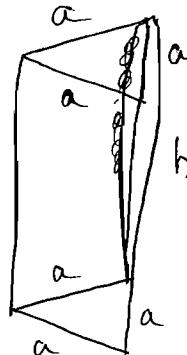
$$1. \text{ లోకణల ప్రెస్టాగ్ } = 2\pi r \times h \quad (\text{భూ. చూ. రీ } \times \text{ఎత్తు})$$

$$2. \text{ సంఖ్యల ప్రెస్టాగ్ } = \text{ లోకణ ప్రెస్టాగ్ } + \text{ top } + \text{ bottom}$$

$$= 2\pi rh + 2\pi r^2$$

$$3. \text{ ఘనపరిమాణం } = \text{ భూమి ప్రెస్టాగ్ } \times \text{ ఎత్తు } \\ = \pi r^2 \times h$$

II.

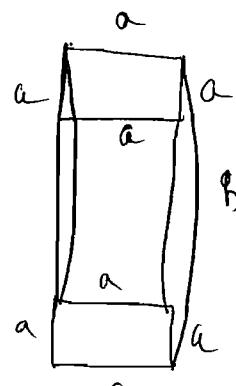


$$① \text{ LSA } = 3axh$$

$$② \text{ TSA } = \text{ LSA } + \text{ Top } + \text{ bottom } \\ = 3ah + 2 \times \frac{\sqrt{3}}{4} a^2$$

$$③ \text{ V } = \frac{\sqrt{3}}{4} a^2 \times h$$

III.



$$① \text{ LSA } = 4a \times h$$

$$② \text{ TSA } = 4ah + a^2 + a^2$$

$$③ \text{ V } = a^2 \times h$$

\* ఇవన్నీ ప్రిసమ్ ఏ examples.

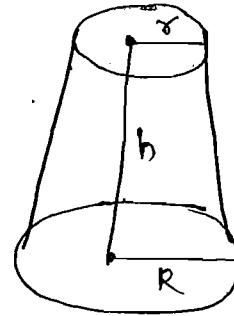
\* ప్రిసమ్ కి భూమి, ఎత్తు వుండంది.

## ④ Pyramid (పిరమిడ్):

\* పిరమిడ్ కు Only bottom, No top.

1. ప్రతితల ప్రెక్షల్యూ (LSA) =

$$\frac{1}{2} \times \text{భూమి వైట్} \times \text{వీటివాయిత్తు}$$

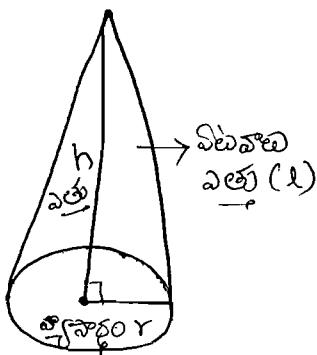


2. సంతల ప్రెక్షల్యూ = LSA + bottom

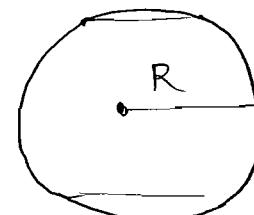
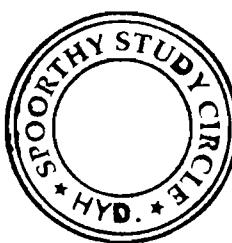
3. ప్రశాపించినావు =  $\frac{1}{3} \times \text{భూమి వైట్} \times \text{వీటివాయిత్తు}$

Examples for Pyramid

## I). శంకువు (CONE):



$$\begin{aligned} l^2 &= r^2 + h^2 \\ l &= \sqrt{r^2 + h^2} \end{aligned}$$



It's like earth

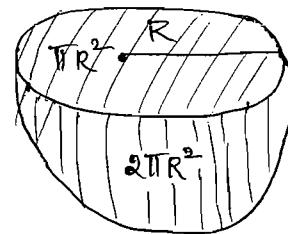
$$\begin{aligned} 1. \text{ప్రతితల ప్రెక్షల్యూ} &= \frac{1}{2} \times \text{భూమి వైట్} \times \text{వీటివాయిత్తు} \\ &= \frac{1}{2} \times \pi r l \\ &= \pi r l \end{aligned}$$

$$\begin{aligned} 2. \text{సంతల ప్రెక్షల్యూ} &= LSA + \text{bottom} \\ &= \pi r l + \pi r^2 \end{aligned}$$

$$\begin{aligned} 3. \text{ప్రశాపించినావు} &= \frac{1}{3} \times \text{భూమి వైట్} \times \text{వీటివాయిత్తు} \\ &= \frac{1}{3} \times \pi r^2 \times h \end{aligned}$$

$$\begin{aligned} 1. \text{ప్రతితల ప్రెక్షల్యూ} &= 4\pi R^2 \\ 2. \text{ప్రశాపించినావు} &= \frac{4}{3} \pi R^3 \end{aligned}$$

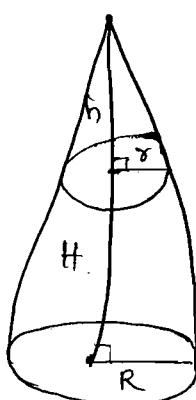
## IV. Hemisphere (అర్ధగోళము):



$$\begin{aligned} 1. \text{ప్రతితల ప్రెక్షల్యూ} &= 2\pi R^2 \\ 2. \text{సంతల ప్రెక్షల్యూ} &= 3\pi R^2 \\ 3. \text{ప్రశాపించినావు} &= \frac{2}{3} \pi R^3 \end{aligned}$$

## V) Frustum:

$$\frac{\frac{h}{r}}{H} = \frac{H}{R} \quad \frac{h}{H} = \frac{r}{R}$$



# R.S. Aggarwal Book

$$\textcircled{1} \quad l = 8, b = 6, h = 2.5$$

$$\begin{aligned} \text{कुनैष्ठमार्ग} &= lbh \\ &= 8 \times 6 \times 2.5 \text{ m}^3 \\ &= 120 \text{ m}^3 \\ &= 120 \times 1000 \text{ ली.} \\ &= 120000 \text{ ली.} \end{aligned}$$

$$1 \text{ m}^3 = 1000 \text{ Litres}$$

$$\begin{aligned} \textcircled{2} \quad \text{सर्वात्मक घे.} &= 2(lb + bh + lh) \\ l = 10 &= 2(40 + 12 + 30) \\ b = 4 &= 2(82) \\ h = 3 &= 164 \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad l = 6 \text{ m}, b = 4 \text{ m}, h = 1.25 \text{ m} \\ \text{त्रिकोणीय क्षेत्र} &= \text{लम्बा त्रिक्षेत्र} - \text{उत्कल्पना क्षेत्र} \\ &= 2(lb + bh + lh) - lb \\ &= 2(24 + 5 + 7.5) - 24 \\ &= 2(36.5) - 24 \\ &= 73 - 24 \\ &= 49 \text{ m}^2 \end{aligned}$$

$$\textcircled{4} \quad l = 3 \text{ m}, b = 2 \text{ m}, h = 1 \text{ cm} = \frac{1}{100} \text{ m} = 0.01 \text{ m}$$

$$\text{नींवधु} = 3 \times 2 \times 0.01 = 0.06 \text{ m}^3$$

$$\text{नींवधु} = \frac{\text{त्रिक्षेत्र}}{\text{कुनैष्ठमार्ग}}$$

$$1000 = \frac{x}{0.06}$$

$$x = 60 \text{ kg}$$

$$\text{नींवधु} = 1000 \text{ kg/m}^3$$

$$\textcircled{5} \quad V = (l b) h$$

$$V = A \times h$$

$$A = 6500 \text{ cm}^2$$

$$= 6500 \times \frac{1}{100} \times \frac{1}{100} \text{ m}^2$$

$$= 0.65$$

$$h = \frac{V}{A} = \frac{2.6}{0.65} = \frac{\cancel{2.6}}{\cancel{0.65}} \times \frac{100}{65} = \frac{260}{65} = 4 \text{ m}$$

$$\textcircled{6} \quad l = x \text{ cm}, b = 28 \text{ cm}, h = 5 \text{ cm}$$

$$\begin{aligned} \text{कुनैष्ठमार्ग} &= lbh \\ &= x \times 28 \times 5 \\ &= 140x \text{ cm}^3 \end{aligned}$$



$$\text{वज़ा} \rightarrow 25 \text{ gm}$$

$$140x \text{ cm}^3 \rightarrow ? (\text{112 kg})$$

$$= \frac{140x \times 25}{1} = \frac{8}{112} \times 10000 \text{ gm}$$

$$x = 32 \text{ cm}$$

$$\textcircled{7} \quad 1 \text{ hectare} = 10,000 \text{ m}^2$$

$$= 10000 \times 100 \times 100 \text{ cm}^2$$

$$\text{वायु क्षमता} = \frac{1}{2} \text{ m}^3$$

$$= \frac{1}{2} \times 100 \times 100 \times 100 \text{ cm}^3$$

$$\text{त्रिक्षेत्र वायु क्षमता} V = A \times h \quad \text{वायु क्षमता}$$

$$= 1 \text{ hectare} \times t$$

$$V = 10000 \times 100 \times 100 \text{ cm}^2 \times t$$

$$\frac{1}{2} \times 100 \times 100 \times 100 \text{ cm}^3 = 10000 \times 100 \times 100 \text{ cm}^2 \times t$$

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

$$t = 0.005$$

OR

$$V = A \times h$$

$$\frac{1}{2} m^3 = 10,000 m^2 \times t$$

$$t = \frac{1}{20000} m$$

$$t = \frac{1}{20000} \times 100 \text{ cm}$$

$$t = \frac{1}{200} \text{ cm}$$

$$t = 0.005 \text{ cm}$$

$$\text{வளர்வு} = 2(lb + bh + lh)$$

$$= 2(6x^2 + 2x^2 + 3x^2)$$

$$= 2(11x^2)$$

$$= 22x^2$$

$$\text{வளர்வு} = 22 \times 12 \times 12$$

$$= 22 \times 144$$

$$= 3168$$

$$\text{போ} = 3168 \times \frac{2}{100} \text{ Rs}$$

$$= 63.36$$

(11)

$$1x, 2x, 3x$$

$$\text{வளர்வு} = 2(lb + bh + lh) = 88$$

$$2(2x^2 + 6x^2 + 3x^2) = 88$$

$$11x^2 = 88$$

$$x^2 = 4$$

$$x = 2$$



3) Area = 1.5 hectare

$$= 1.5 \times 10,000 \text{ m}^2$$

$$= 15000 \text{ m}^2$$

$$\text{பொ.வீ.வு} = A \times b$$

$$= 15000 \text{ m}^2 \times \frac{5}{100} \text{ m}$$

$$= 750 \text{ m}^3$$

4)  $\frac{h}{b} = \frac{6}{1}, \frac{l}{b} = \frac{7}{1}$

$$h:b = 6:1 \quad (l:b = 7:1) \times 6$$

$$l:b:h = 42:1:6$$

$$l:b:h = 42:1:6$$

$$42x, 1x, 6x$$

$$V = lbh = 16128$$

~~$$42x \times 1x \times 6x = 16128$$~~

$$x^3 = 64$$

$$x = 4$$

$$b = 1x = 4$$

5)  $l:b:h = 3:2:1$

$$3x, 2x, 1x$$

$$\text{பொ.வீ.} = lbh = 10368$$

~~$$8x \times 2x \times 1x = 10368$$~~

$$x^3 = 1728$$

$$x = 12$$

$$\text{பொ.வீ.} = 1x \times 2x \times 3x$$

$$= 6x^3$$

$$= 6 \times 2^3$$

$$= 48$$

(12)

$$\text{கீழால்} d = \sqrt{l^2 + b^2 + h^2}$$

$$= \sqrt{8^2 + 6^2 + 2^2}$$

Triplet

$$= \sqrt{10^2 + 2^2}$$

$$(3, 4 = 5)$$

$$= \sqrt{104}$$

$$= \sqrt{4 \times 26}$$

$$6^2 + 8^2 = 10^2$$

$$= 2\sqrt{26}$$

(13)

$$\text{கீழால்} d = \sqrt{l^2 + b^2 + h^2}$$

$$d = \sqrt{(16^2 + 12^2) + \left(\frac{32}{3}\right)^2}$$

Triplet  
(3, 4 = 5)  $\times 4$

$$= \sqrt{400 + \frac{1024}{9}}$$

$$12 + 16 = 20^2$$

$$= \sqrt{\frac{4624}{9}} = \frac{68}{3} = 22 \frac{2}{3}$$

(14)

$$\text{No. of Bricks} = \frac{\text{వీధి కు.ప}{\text{ఒకటి ఇంచ్ కు.ప}} \\ = \frac{800 \times 600 \times 2250}{25 \times \frac{45}{4} \times 600} \\ = 6400$$

(15)

$$\text{No. of Bricks} = \frac{\text{వీధి కు.ప}{\text{ఒకటి ఇంచ్ కు.ప}} \\ = \frac{95\% \times 600 \times \frac{20}{500 \times 50}}{25 \times \frac{35}{2} \times \frac{15}{2}} \\ = \frac{95}{100} \times 40 \times 20 \times 2 \times 4 \\ = 95 \times 64 \\ = 6080$$

(16)

$$50 \text{ మంచి రీటింగ్ కు.ప} = 50 \times 4 \text{ m}^3 = 200 \text{ m}^3$$

$$\text{ఫన్ వాయాడు} = lbh = 200 \text{ m}^3$$

$$40 \times 20 \times h = 200 \text{ m}^3$$

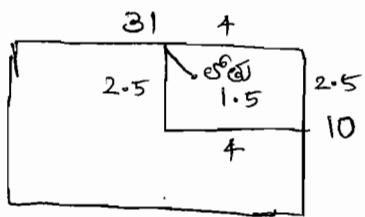
$$h = \frac{1}{4} \text{ m}$$

$$h = \frac{1}{4} \times 100$$

$$h = 25 \text{ cm}$$



(17)



వెలమ.

$$\text{వెలమ} = 31 \times 10 - 4 \times 2.5 \\ = 310 - 10 \\ = 300$$

$$\begin{aligned} \text{పోటు} &= \frac{\text{మొత్తమొర్గా}}{\text{పోటు}} \\ &= \frac{4 \times 2.5 \times 1.5}{300} \\ &= \frac{25 \times 15}{75} \\ &= \frac{75 \times 10 \times 10}{75} \end{aligned}$$

$$= \frac{5}{100} \text{ m}$$

$$= \frac{5}{100} \times 100 \text{ cm} \\ = 5 \text{ cm}$$

(18)

$$S = \frac{d}{t}$$

$$\text{సమాంతర ల} = S \times t$$

$$= 315 \times \frac{5}{18} \text{ m} \times \frac{10}{60 \text{ sec}} \\ = \frac{175}{3} \text{ m}$$

$$V = l b h$$

$$= \frac{175}{3} \times 1.5 \times \frac{12}{36}$$

$$= 175 \times 18 \\ = 3150 \text{ m}^3$$

(19)

$$l = 80 \text{ m}, b = 40 \text{ m}, h = x$$

$$\text{ప్రాంత కు.ప} = \text{గొట్టం ఇంచ్ కు.ప} \times \frac{1}{2} \text{ గొ.లిపలనీపాటు}$$

$$80 \times 40 \times x = 40 \text{ cm}^2 \times 5000 \text{ m}$$

$$80 \times 40 \times x = \frac{40}{100 \times 100} \text{ m}^2 \times \frac{1}{5000} \text{ m}$$

$$x = \frac{1}{160} \text{ m}$$

$$x = \frac{100}{8 \times 60} = \frac{5}{8} \text{ cm}$$

$$\Rightarrow 10 kh \Rightarrow 5 \text{ cm/h} \text{ (half hours)} \Rightarrow 5000 \text{ m/h}$$

(20)

$$4 \text{ గొట్టం ఇంచ్ కు.ప} = \text{సేఱ} + \text{ఎక్స్ట్రా}$$

$$2h(l+b) = 15 \times 12 + 15 \times 12$$

$$2h(l+b) = \frac{180}{360}$$

$$h(15+12) = 180$$

$$h = \frac{180}{27}$$

$$V = l b h$$

$$= 15 \times 12 \times \frac{20}{3}$$

$$= 1200$$

(21)  $l+b+h=19$ ,  $\sqrt{l^2+b^2+h^2}=5\sqrt{5}$

இரு வீசுலா வடிவம் அல்லது  $l^2+b^2+h^2=125$

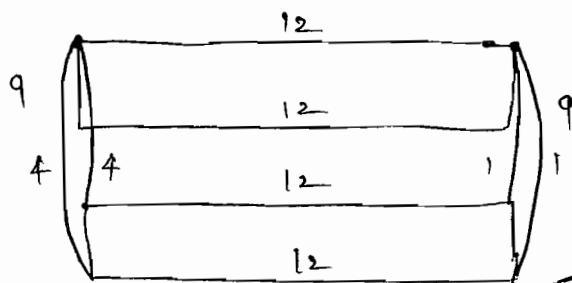
$l^2+b^2+h^2+2(lb+bh+lh)=361$

எ.தலை 2(lb+bh+lh)

$$125 + 2(lb+bh+lh) = 361$$

(+)      (-)

$$2(lb+bh+lh) = 236$$

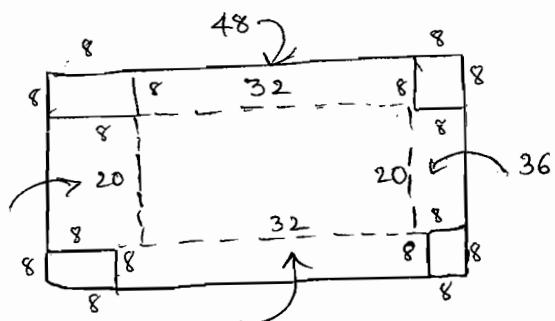


$$\text{ஏற்கனவேற்று} = \frac{4+1}{2} = 2.5$$

$$\text{கூடும் பரப்பு} = lbh$$

$$= 12 \times 9 \times 2.5$$

$$= 270 \text{ m}^3$$



$$\text{கூடும் } l=32, b=20, h=8$$

$$V = lbh$$

$$= 32 \times 20 \times 8$$

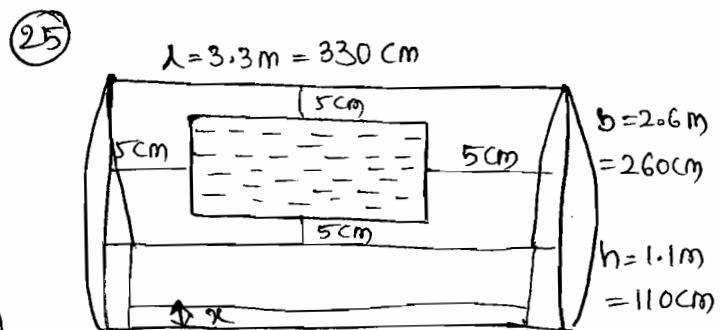
$$= 5120$$

(24)

$l = 1.46 \text{ m} = 146 \text{ cm}$	$b = 1.16 \text{ m} = 116 \text{ cm}$	$h = 8.3 \text{ m} = 83 \text{ cm}$
$l = 146 - 6 = 140$	$b = 116 - 6 = 110$	$h = 83 - 3 = 80$
<u>கொடுக்கும் தொகை</u> 55400		

$$\begin{aligned} \text{கொடுக்கும்} &= 4 \text{ கருவு} + \text{floor} \\ &= 2h(l+b) + lb \\ &= 2 \times 80(140+110) + 140 \times 110 \\ &= 160(250) + 15400 \\ &= 40000 + 15400 \end{aligned}$$

$$\begin{aligned} 100 \text{ cm}^2 &\rightarrow \frac{1}{2} \text{ RS} \\ 55400 &\rightarrow ? = \frac{1}{2} \times \frac{\frac{277}{55400}}{100} \\ &= 277 \text{ RS.} \end{aligned}$$



$$l = 330 - 10 = 320 \text{ cm}$$

$$b = 260 - 10 = 250 \text{ cm}$$

$$h = (110 - x) \text{ cm}$$

$$\begin{aligned} V &= lbh = 8000 \text{ liters} \\ &= 8 \times 1000 \text{ liters} \\ &= 8 \text{ m}^3 \end{aligned}$$

$$\begin{aligned} &= 320 \times 250 \times (110 - x) = 8 \times \frac{1}{100} \times 100 \times 100 \text{ cm}^3 \\ (110 - x) &= 100 \end{aligned}$$

$$x = 10 \text{ cm}$$

$x = 1 \text{ decimeters}$

(26)

$l \times b \times h = \boxed{V}$	$\text{ஒரு கு.வ.}$
$16 \text{ kg}$	$= \frac{l}{4} \times \frac{b}{4} \times \frac{h}{4}$
	$= \frac{lbh}{64}$
	$= \frac{V}{64} = \frac{1}{64} \times 16 \text{ kg}$
	$= \frac{1}{4} \text{ kg}$
	$= 0.25 \text{ kg}$

(27)

వ్యాపక వస్తులలు ప్రెట్టాల్ఫ్యా

$$A_1 = lh, A_2 = bh, A_3 = lb \text{ అయితే}$$

$$A_1 \times A_2 \times A_3 = lh \times bh \times lb \quad \text{ఏన్ని} \\ = (l b h)^2 \quad \text{కావున}$$

$$\text{భస్తులలు ప్రెట్టాల లభ్యమణి} = (\text{ఖండమణి})^2$$

$$28) A_1 = lh = 120$$

$$A_2 = bh = 72$$

$$A_3 = lb = 60$$

$$lh \times bh \times lb = (120) \times 72 \times 60$$

$$(l b h)^2 = 60 \times 60 \times 12 \times 12$$

$$l b h = 60 \times 12$$

$$\text{ఖండమణి } l b h = 720$$

$$29) A_1 : A_2 : A_3 = 2 : 3 : 4$$

$$A_1 = lh = 2x = 300$$

$$A_2 = bh = 3x = 450$$

$$A_3 = lb = 4x = 600$$

$$(l b h)^2 = (2x)(3x)(4x)$$

$$\cancel{24}x^3 = \frac{375}{9000} \times 9000$$

$$x^3 = 3 \times 125 \times 9000$$

$$x^3 = 3 \times 3 \times 3 \times 5 \times 5 \times 5 \times 10 \times 10 \times 10$$

$$x = 3 \times 5 \times 10$$

$$x = 150$$

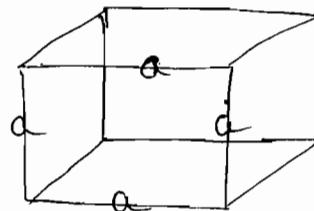
$$lbh = 9000, lh = 300, b = \frac{lbh}{lh} = \frac{9000}{300} = 30$$

$$lbh = 9000, bh = 450, l = \frac{lbh}{bh} = \frac{9000}{450} = 20$$

$$lbh = 9000, lb = 600, h = \frac{lbh}{lb} = \frac{9000}{600} = 15$$

$$\text{కెట్టుభూమి} = 15 \text{ cm}$$

(30)



$$a = 5 \text{ cm}$$

$$\text{ఖండమణి} = a^3 = 5^3 = 125 \text{ cm}^3$$

$$30) a = 0.5 \text{ cm} = \frac{1}{2} \text{ cm}$$

$$\text{ఖండమణి} = 6a^2 \\ = 6 \times \frac{1}{2} \times \frac{1}{2} \\ = \frac{3}{2} \text{ cm}^2$$

$$32) \text{సొత్తమణి} = 6a^2 \\ = 6 \times 8^2 \\ = 384 \text{ చెఱిటీలు}$$

$$16 \text{ చెఱిటీ} \rightarrow 1 \text{ kg}$$

$$384 \text{ చెఱిటీ} \rightarrow ? = \frac{384}{16} = 24 \text{ kg}$$

$$\text{ఖండమణి} = 24 \times 36.5 \\ = 876$$

$$33) \text{ఖండమణి} (\text{ఖండమణి}) = \text{ఖండమణి} (\text{ఖండమణి})$$

$$lbh = a^3$$

$$270 \times 100 \times 64 = a^3 \quad | \quad \text{సొత్తమణి} 6a^2 \\ a^3 = 3^3 \times 10^3 \times 4^3 \quad | \quad = 6 \times (120)^2 \\ a = 3 \times 10 \times 4 \quad | \quad = 6 \times 14400 \\ a = 120 \quad | \quad = 86400$$

(34)

$$\text{సొత్తమణి} \times 13.3 \text{ cm}^2 = \frac{2646}{34398} \text{ రూలు}$$

$$6a^2 = \frac{2646}{441}$$

$$a^2 = 441$$

$$a = 21$$

$$\text{ఖండమణి} = (21)^3 = 9261$$

(35)  $a^3 = 729$

$a^3 = 9^3$

$a = 9$

$\text{సమి} = 6a^2$

$= 6 \times 9^2$

$= 6 \times 81$

$= 486$

(36) ఖనంభు20  $a = \sqrt{3}$

$\text{రెట్యూ} = \sqrt{3} \cdot a$

$= \sqrt{3} \cdot \sqrt{3}$

$= 3$

(37) రెట్యూ =  $\sqrt{3} \cdot a = 4\sqrt{3}$

$a = 4$

ఫ.వ. =  $a^3 = 4^3 = 64$

(38)  $6a^2 = 600$

$a^2 = 100$

$a = 10$

$\text{రెట్యూ} = \sqrt{3} \cdot a$

$= \sqrt{3} \cdot 10$

$= 10\sqrt{3}$

(39) ఖనం.ఫ.వ. = సమిత్రా  
 $a^3 = 6a^2$

$a = 6$

(40)  $\text{సమి} = \frac{\text{పద్ధతినంపు.వ}}{\text{గొణినంపు.వ}} = \frac{(100\text{cm})^3}{(10\text{cm})^3} = 1000$

(41)  $\text{సమి} = \frac{\text{పద్ధతిచీటికి.ఫ.వ}}{\text{గొణినంపు.ఫ.వ}}$

$= \frac{lbb}{a^3}$

$= \frac{8 \times 100 \times 60}{20 \times 20 \times 20}$

$= 120$

(42)  $\text{సమి} = \frac{\text{పద్ధతినంపు.వ}}{\text{గొణినంపు.వ}}$

$= \frac{18 \times 18 \times 18}{3 \times 3 \times 3} = 216$

(43)  $\text{సమి} = \frac{\text{పద్ధతిచీటినంపు.వ}}{\text{గొణినంపు.వ}}$

$= \frac{6 \times 9 \times 12}{3 \times 3 \times 3} = 24$

ఖనంభు20 = HCF (6, 9, 12) = 3

(44)  $\text{సమి} = \frac{\text{పద్ధతిచీటినంపు.వ}}{\text{గొణినంపు.వ}}$

$= \frac{5 \times 10 \times 20}{5 \times 5 \times 5} = 8$

ఖనంభు20 = HCF (5, 10, 20) = 5

(45)

10cm

మాదు = 0.5cm

$= \frac{1}{2} \text{ cm}$

ఫ.వ. = ఫ.వ.

$10 \times 10 \times 10 = 5 \times 1 \times 1 \times \frac{1}{2}$

$x^2 = 400$

$x = 20$

$l:b = 5:1$

$5x, 1x$

$5 \times 20, 1 \times 20$

$= 100, 20$

(46)  $a^3 = a_1^3 + a_2^3 + a_3^3$

$a^3 = 6^3 + 8^3 + 10^3$

$= 216 + 512 + 1000$

$a^3 = 1728$

$a = 12$

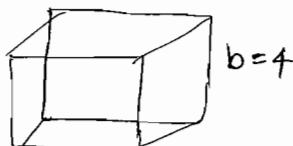
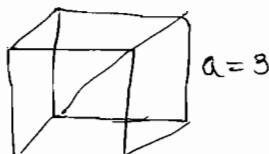
47



$$\text{కుసుమా కుసుమ} = 5^3 = 125$$

$$5 \text{ పునర్విషాయ} = 5 \times 125 = 625 \text{ cm}^3$$

48



\*\*

$$① \text{ఖరుచలనిష్టతి } a:b = 3:4$$

$$② \text{వక్కతల వ్యాస} = \sqrt{a^2 + b^2} = (3:4)^2$$

$$③ \text{సామానీ వ్యాస} = \sqrt{a^2 + b^2} = (3:4)^2$$

$$④ \text{ఘనిషాయ} = a^3 : b^3 = (3:4)^3$$

\*\*

$$⑤ \text{ఖరుచలనిష్టతి} (\text{అనుభంగ}) = 1:5$$

$$\text{సామానీ వ్యాస} = (1:5)^2 = 1:25$$

49

$$\text{cube} = \frac{\square}{3} + \frac{\square}{4} + \frac{\square}{5}$$

$$a^3 = 3^3 + 4^3 + 5^3$$

$$a^3 = 27 + 64 + 125$$

$$a^3 = 216$$

$$a = 6$$



$$\text{అనుభంగా వ్యాస} = \frac{6a_1^2 + 6a_2^2 + 6a_3^2}{6}$$

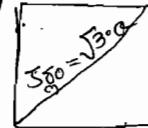
$$\text{పెద్ద సామానీ వ్యాస} = \frac{6a^2}{6^2}$$

$$= \frac{25}{\frac{36}{18}}$$

$$= \frac{25}{18}$$

$$= 25:18$$

50



$$\frac{\sqrt{560}}{3x} = \frac{\square}{3x} + \frac{\square}{4x} + \frac{\square}{5x}$$

$$a = 12$$

$$\left. \begin{array}{l} \sqrt{560} = 12\sqrt{3} \\ a = 12 \end{array} \right\} a^3 = a_1^3 + a_2^3 + a_3^3$$

$$12^3 = (3x)^3 + (4x)^3 + (5x)^3$$

$$\frac{1728}{1728} = 216x^3$$

$$x^3 = 8$$

$$x = 2$$

$$x = 2 \Rightarrow \frac{3x}{6}, \frac{4x}{8}, \frac{5x}{10} \Rightarrow 3(2)(4(2))(5(2))$$

సామానీ వ్యాసాలు

$$51 \quad \text{ఫ.వ.ా. నిష్టతి} = (\text{ఖరుచలనిష్టతి})^3$$

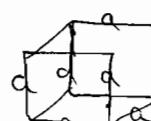
$$27:1 = (\text{ఖరుచలనిష్టతి})^3$$

$$\text{ఖరుచల} = \sqrt[3]{\frac{27}{1}} = \frac{3}{1} \Rightarrow 3:1$$

52

ఫ.వ.ా. నిష్టతి	ఖరుచలనిష్టతి	ప్రశ్నల నిష్టతి
$8:27$ $2^3:3^3$	$2:3$	$4:9$

53

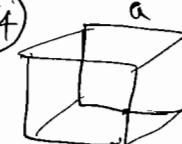


$$\frac{a^3}{b^3} = \frac{1}{27} = \frac{1^3}{3^3}$$

$$a:b = 1:3$$

$$\text{మధ్య వ్యాస} = a^2 : b^2 = (1:3)^2 = 1:9$$

54



$$V = a^3$$



$$V = (2a)^3$$

$$V = 8a^3$$

8 times

I. కున్సంపరిషున 10% వాటితే

$$1). \text{వక్రతలమై మార్పు} = \cancel{\pi a^2} \cdot 2\pi a h \quad 10\% \uparrow 10\% \uparrow$$

$$2). \text{సామానీ తలమై మార్పు} = \cancel{\pi a^2} (2\pi a h) \quad 10\% \uparrow 10\% \uparrow$$

$$3). \text{ఫు.ఎ. మార్పు} = a^3 \quad (\text{అస్తు}) \quad 10\% \uparrow 10\% \uparrow 10\% \uparrow$$

$$(A) \frac{a+b+\frac{ab}{100}}{100} = 10+10+\frac{10 \times 10}{100} \\ = 21\% \uparrow$$

$$(B) a+b+\frac{ab}{100} = 10+10+\frac{10 \times 10}{100} = 21\% \uparrow$$

$$(C) a+b+\frac{ab}{100} = 10+(0+\frac{10 \times 10}{100}) = 21\% \uparrow$$

$10\% \uparrow, 10\% \uparrow, 10\% \uparrow$

$$\begin{aligned} &= ab + \frac{ab}{100} \\ &= 10 \cdot 21\% + 10 + \frac{21 \times 10}{100} = 31 + 2 \cdot 1 \\ &= 33.1\% \end{aligned}$$

55) వక్రతల  $= \cancel{\pi a^2} (2\pi a h)$   
 $25\% \uparrow, 25\% \uparrow$

$$\begin{aligned} \text{అస్తుంచల మార్పు} &= a+b+\frac{ab}{100} \\ &= 25+25+\frac{25 \times 25}{100} \\ &= 50+\frac{625}{100} \\ &= 50+6.25 \\ &= 56.25\% \uparrow \end{aligned}$$

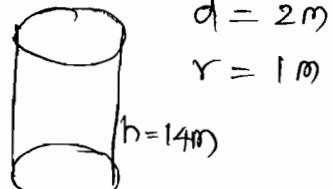
రూపాధి

$$LSA = 2\pi r h$$

$$TSA = 2\pi r h + 2\pi r^2$$

$$V = \pi r^2 h$$

(56)



$$\begin{aligned} \text{ప్ర.మ.} &= \pi r^2 h \\ &= \frac{22}{7} \times 1 \times 1 \times 14 \\ &= 44 \text{ m}^3 \end{aligned}$$

(57)

$$V = \pi r^2 h = 246.4 \text{ ltrs}$$

$$\cancel{\frac{22}{7} \times r^2 \times h} = \frac{\cancel{2464}^{28}}{10} \times \frac{1}{1000}$$

$$\begin{aligned} \text{రూపాధి} \\ = 0.28 \text{ m} \end{aligned}$$

$$r^2 = \frac{28 \times 7}{10000}$$

$$r^2 = \frac{7 \times 7 \times 2 \times 2}{100 \times 100}$$

$$r = \frac{7 \times 2}{100}$$

$$r = 0.14$$

(58)

$$\begin{aligned} LSA &= 2\pi r h = 2640 \\ 66 \times h &= \cancel{2640}^{40} \\ h &= 40 \end{aligned} \quad \left| \begin{array}{l} \text{ప్ర.మ.} = 2\pi r = 66 \\ = 2 \times \cancel{22}^3 \times r = \cancel{66}^7 \\ r = \frac{21}{2} \end{array} \right.$$



$$\begin{aligned} V &= \pi r^2 h \\ &= \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2} \times 40 \\ &= 13860 \end{aligned}$$

(59)

$$r = h$$

$$V = \pi r^2 h = 25 \frac{1}{7}$$

$$\cancel{\frac{22}{7} \times r^2 \times r} = \frac{176}{7}$$

$$r^3 = 8$$

$$r = 2$$

\*\*

(60)

$$h = 14$$

$$\text{LSA} = 2\pi rh = 704$$

$$= \cancel{2} \times \cancel{\frac{22}{7}} \times r \times \cancel{14} = \cancel{648}$$

$$r = 8$$

$$V = \pi r^2 h$$

$$= \cancel{\frac{22}{7}} \times 8 \times 8 \times \cancel{14}$$

$$= 2816$$

$$\underline{64}$$

(61)

$$\text{வளர்தல்} = 2\pi rh + 2\pi r^2$$

$$= 2\pi r(h+r)$$

$$= \cancel{2} \times \cancel{\frac{22}{7}} \times \cancel{\frac{25}{5}} \left( 1.25m + 0.35m \right)$$

$$= \frac{11}{5}(1.6)$$

$$= \frac{17.6}{5} m^2$$

$$4 m^2 \rightarrow 80 \text{ Rs}$$

$$\frac{17.6}{5} m^2 \rightarrow ? = \frac{17.6}{5} \times \cancel{80} = 281.6$$

(62)

$$\text{புகை} \times K = \text{வருதல திட்டம்}$$

$$\pi r^2 h \times K = 2\pi r^2 h$$

$$K = \frac{2}{r}$$

(63)

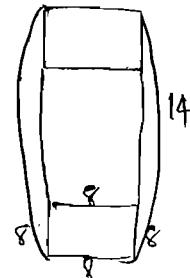
$$r = 20, h = 60$$

$$\frac{\text{வளர்தல்}}{\text{வருதல்}} = \frac{2\pi rh + 2\pi r^2}{2\pi rh} =$$

$$= \frac{2\pi r(h+r)}{2\pi rh} = \frac{h+r}{h}$$

$$= \frac{60+20}{60} = \frac{80}{60} = \frac{4}{3}$$

(64) வடிவசீர்



$$\text{புகை} = \sqrt{2} \times \text{நிலை}$$

$$= a^2 \times b$$

$$= 8^2 \times 14$$

$$= 64 \times 14$$

$$= 896$$

$$d = 8$$

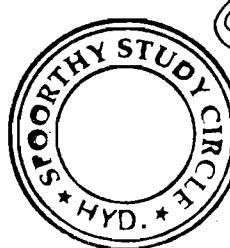
$$r = 4$$

$$\text{புகை} = \pi r^2 \times h$$

$$= \frac{22}{7} \times 4 \times 4$$

$$= 704$$

$$\text{தீர்மானம்} = 192 \text{ cm}$$



(65)

$$V = \pi r^2 h = 12936$$

~~$$\frac{22}{7} \times 21 \times 21 \times 36 = 12936$$~~

$$r: h = 2:3$$

$$2x, 3x$$

$$r = 2x, h = 3x$$

$$r = 14, h = 21$$

$$x^3 = 7 \times 7 \times 7$$

$$x = 7$$

$$\text{வளர்தல்} = 2\pi r(h+r)$$

$$= 2 \times \frac{22}{7} \times \frac{2}{14} (21+14)$$

$$= 88(35)$$

$$= 3080 \text{ cm}^2$$

(66)

$$\text{வளர்தல்} = 2\pi r(h+r) = 616 \text{ cm}^2$$

$$\text{வருதல்} + \text{bottom} = 616 \text{ cm}^2$$

$$2\pi rh + \pi r^2 = 616$$

$$\pi r(2h+r) = 616$$

~~$$\frac{22}{7} \times \frac{h}{2} (2h + \frac{h}{2}) = 616$$~~

$$\frac{5h^2}{14} = 56$$

$$h^2 = \frac{14 \times 14 \times 2 \times 2}{5}$$

$$r = \frac{h}{2}$$

69) ఒక్క శువహరణానికి తెఱచ్చ నంపుత్త తలప్రశ్నలు దీనిలో ల్యాపిస్ అయినచేనేట ప్రయోగాల వల్ల వ్యవస్థనిః రెట్టంపును చేసు కోవలను.

$$h = 2r$$

$$h = d$$

$$\text{ఫాఫ} = \pi r^2 h$$

$$= \frac{22}{7} \times \frac{14^2}{15} \times \frac{14}{\sqrt{5}} \times \frac{28}{\sqrt{5}} \text{ cm}^3$$

$$= \frac{17248}{5 \times 2} \times \frac{1}{1000} \text{ lts.}$$

$$= 1.72 \text{ ltrs లఘువు} / 2 \text{ ఏలీ॥}$$

67)

$$r+h = 37 \quad | \quad \text{సామి} = 2\pi r(h+r) = 1628$$

$$r+h = 37 \quad | \quad = 2 \times \frac{22}{7} \times r \times 37 = \frac{37}{148} \times 1628$$

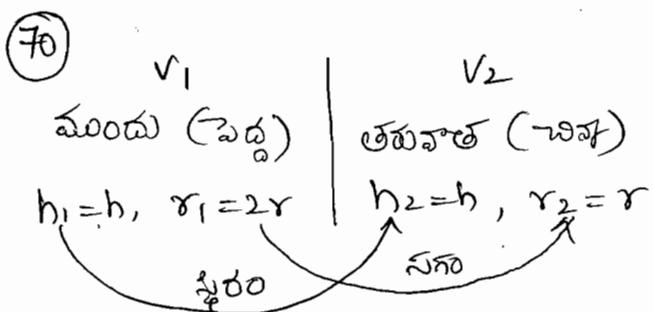
$$h = 30 \quad | \quad r = 7$$

$$V = \pi r^2 h$$

$$= \frac{22}{7} \times 1 \times 7 \times 30$$

$$= 22 \times 210$$

$$= 4620$$



$$\frac{\text{తుఱవాత}}{\text{మందు}} = \frac{V_2}{V_1} = \frac{\pi r_2^2 h_2}{\pi r_1^2 h_1} = \frac{r \times r \times h}{2r \times 2r \times h} = \frac{1}{4}$$

71)

$$\frac{V_1}{V_2} = \frac{\pi r_1^2 h_1}{\pi r_2^2 h_2} = \frac{2}{3} \times \frac{2}{3} \times \frac{5}{3} = \frac{20}{27}$$

72)

$$V_1 = V_2 \quad | \quad h_1 : h_2 = 1 : 2$$

$$\pi r_1^2 h_1 = \pi r_2^2 h_2 \quad | \quad h_2 : h_1 = 2 : 1$$

$$\frac{r_1^2}{r_2^2} = \frac{h_2}{h_1}$$

$$\left(\frac{r_1}{r_2}\right)^2 = \frac{2}{1}$$

$$\frac{r_1}{r_2} = \sqrt{\frac{2}{1}} \Rightarrow r_1 : r_2 = \sqrt{2} : 1$$

73)

$X$	$\text{సగి}$	$Y$
$\text{ప్రతిభు} r_1 = r$	$\text{ప్రతిభు} r_2 = 2r$	
$h_1 = 2h$	$h_2 = h$	
$X = \pi r_1^2 h_1$	$Y = \pi r_2^2 h_2$	
$= \pi r^2 (2h)$	$= \pi (2r)^2 h$	
$X = 2\pi r^2 h$	$= 4\pi r^2 h$	

$$y = 2(2\pi r^2 h)$$

$$y = 2x$$

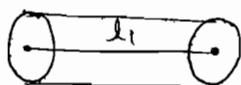
$$x = \frac{y}{2}$$

$$y = 2(2\pi r^2 h)$$

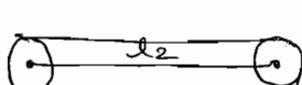
$$y = 2x$$

$$x = \frac{y}{2}$$

74



$$r_1 = 3r$$



$$r_2 = r$$

$$V_1 = V_2$$

$$\pi r_1^2 h_1 = \pi r_2^2 h_2$$

$$(3r)^2 \times h_1 = r^2 \times h_2$$

$$9h_1 = h_2$$

$$9l_1 = l_2$$



75

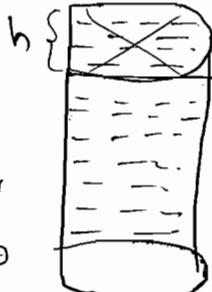
$$\text{त्रिवृत्तीय घूर्णन} = 11 \text{ ltrs}$$

$$= 11 \times 1000 \text{ ltrs}$$

$$\pi r^2 h = 11 \times 1000$$

$$\frac{22}{7} \times \frac{35}{2} \times \frac{35}{2} \times h = 11 \times 1000$$

$$h = \frac{80}{7} = 11 \frac{3}{7} \text{ cm}$$

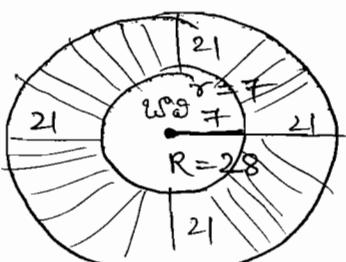


$$d = 35 \text{ cm}$$

$$r = \frac{35}{2} \text{ cm}$$

$$d = 14$$

$$r = 7$$



$$\text{वृत्तीय वर्तन} = \frac{\text{वृत्तीय घूर्णन}}{\text{वृत्तीय वर्तन वेग}}$$

$$= \frac{\pi r^2 h}{\pi (R^2 - r^2)}$$

$$= \frac{\pi \times 7 \times 10}{(28^2 - 7^2)}$$

$$= \frac{\pi \times 7 \times 10^2}{(28^2 - 7^2)} = \frac{2}{3} \text{ m}$$

$$= \frac{35 \times 21}{5} = \frac{2}{3} \text{ m}$$

77

$$\text{वृत्तीय घूर्णन} = \pi r^2 h$$

$$= \frac{22}{7} \times \frac{1}{2} \times \frac{1}{2} \times 200$$

$d = 7$   
 $r = \frac{7}{2}$

$\text{वृत्तीय घूर्णन} = 2\pi r se$   
 $= 200 \text{ cm}$

$$\text{10 लिटर} \text{ वृत्तीय घूर्णन} = 10 \times 60 \times \frac{22}{7} \times \frac{1}{2} \times \frac{1}{2} \times 200$$

$$= 4620000 \text{ cm}^2$$

$$= 4620000 \times \frac{1}{1000} \text{ lts}$$

$$= 4620 \text{ lts.}$$

78

$$\text{वृत्तीय घूर्णन} = n \times \text{वृत्तीय वेग}$$

$$\pi R^2 H = n \times \pi r^2 h$$

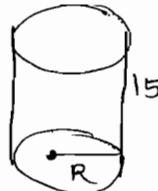
$$3 \times 3 \times 8 = n \times \frac{3}{4} \times \frac{3}{4} \times \frac{1}{5}$$

$$0.75 = \frac{3}{4}$$

$$0.2 = \frac{1}{5}$$

$$n = 640$$

79



$$\pi r_1^2 h_1 + \pi r_2^2 h_2 = \pi R^2 H$$

$$15 \times 15 \times 35 + 10 \times 10 \times 15 = R^2 \times 15$$

$$525 + 100 = R^2$$

$$R^2 = 625$$

$$R = 25$$

80

$$V = \pi r^2 h$$

$$66 \text{ cm}^3 = \frac{22}{7} \times \frac{1}{20} \times \frac{1}{20} \times h$$

$$h = 8400 \text{ cm}$$

$$h = 84 \text{ mtrs.}$$

$$\text{वृत्तीय वर्तन} d = 1 \text{ mm}$$

$$r = \frac{1}{2} \text{ mm}$$

$$r = \frac{1}{2} \times \frac{1}{10} \text{ cm}$$

$$r = \frac{1}{20} \text{ cm}$$

$$\begin{aligned} 3 &= \text{वृत्तीय वर्तन} - \text{वृत्तीय वेग} \\ &= \pi R^2 - \pi r^2 \\ &= \pi (R^2 - r^2) \end{aligned}$$

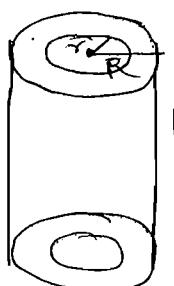
$$\begin{aligned} &= \frac{35 \times 21}{5} = \frac{2}{3} \text{ m} \\ &= \frac{2}{3} \text{ m} \end{aligned}$$

## Hollow Cylinder (ಚೋಳನ್ಹಾಕ್) :

ಚೋಳನ್ಹಾಕ್ ಖ.೦ = ನಯಂಡಿ ಕ್ರಿ - ಲೋಲಿ ಕ್ರಿ

$$= \pi R^2 h - \pi r^2 h$$

$$= \pi h (R^2 - r^2)$$



\*\*

1) ನಯಂಡಿ ಖ.೦ =  $2\pi R = 440$

~~$2 \times \frac{22}{7} \times R = 440$~~

$$R = 70$$

ಚೋಳನ್ಹಾಕ್ ಖ.೦ =  $\pi R^2 h - \pi r^2 h$

$$= \pi h (R^2 - r^2)$$

$$= \frac{22}{7} \times 63 (70^2 - 66^2)$$

~~$= \frac{22}{7} \times 63 \times 136 \times 4$~~

$$= 107712$$

2)

ಚೋಳನ್ಹಾಕ್ ಖ.೦

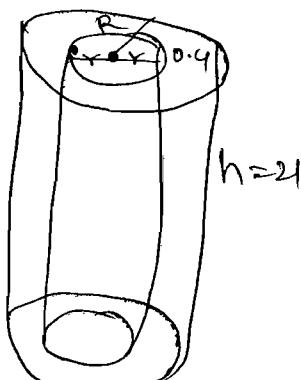
$$= \pi h (R^2 - r^2)$$

$$= \pi h (R+r)(R-r)$$

$$= \frac{22}{7} \times 21 (11.6)(0.4)$$

$$= 66 \times 4.64$$

$$\approx 306.24$$



$$2r = 11.2$$

$$r = 5.6$$

$$R = 5.6 + 0.4 = 6$$

83) ವ್ಯಾಸ D = 2, ವ್ಯಾಸಾರ್ಥ R = 1

ವ್ಯಾಸ D = 12, ವ್ಯಾಸಾರ್ಥ R = 6

ಮೊತ್ತಮಾನದ್ವಾರಾ r = 6 - 0.25

$$r = 5.75$$

ಕ್ರಿಸ್ತಾನ್ ಸ್ಟಾರ್ಟ್ ಖ.೦ = ಚೋಳನ್ಹಾಕ್ ಖ.೦

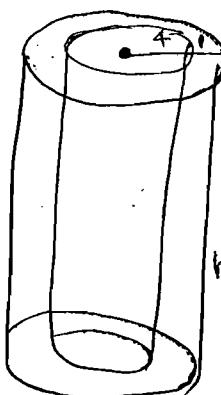
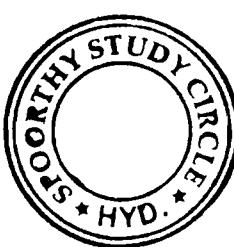
$$\pi R^2 H = \pi h (R^2 - r^2)$$

$$\pi \times 1 \times 1 \times H = \pi \times 15 (R+r)(R-r)$$

$$H = 15(11.75)(0.25)$$

$$H = 44.0625$$

84)



$$D = 8$$

$$R = 4$$

$$r = 3$$

ಕ್ರಿಸ್ತಾನ್ ಖ.೦ =  $\pi h (R^2 - r^2)$

$$= \pi h (R+r)(R-r)$$

$$= \frac{22}{7} \times 21 \times (7)(1)$$

$$\text{ಕ್ರಿಸ್ತಾನ್ ಖ.೦} = 462 \text{ cm}^3$$

$$1 \text{ cm}^3 \rightarrow 8 \text{ gm}$$

$$462 \text{ cm}^3 \rightarrow ? = 462 \times 8 \text{ gm}$$

$$= 3696 \text{ gm}$$

$$= 3.696 \text{ kg}$$

85)

ನೀಂಬಿನ್ಹಾಕ್ ಖ.೦ = 61.6 \text{ cm}^3

$$\pi R^2 h = \frac{616}{10}$$

~~$$\frac{22}{7} \times r^2 \times 40 = \frac{616}{10}$$~~

$$r^2 = \frac{7 \times 10}{1024}$$

$$r^2 = \frac{1}{10}$$



$$D = 16 \text{ mm}$$

$$R = 8 \text{ mm}$$

$$r = 0.7 \text{ mm}$$

$$\begin{aligned} \text{వుండు} &= R - r \\ &= 8 - 7 \\ &= 1 \text{ mm} \end{aligned}$$

## Cone (వంఫవు):

$$1. \text{వక్రతల వైపు} / \text{అంతరల వైపు} = \pi r l$$

$$2. \text{వస్తుభాగము} = \pi r l + \pi r^2$$

$$3. \text{ఖండము} = \frac{1}{3} \pi r^2 h$$



$$l^2 = h^2 + r^2$$

\*Imp

## TRIPLETS

\* ఇంగ్లీషు సిద్ధాంతస్తోపాయమను  
/ఎలావలనే Triplets అంటారు. చేంతో  
సుధారిస్తామని, భూగోళిస్తామని Triplets అంటామి.

$$\begin{aligned} 1) \quad (3 & \quad 4 & = 5) \times 2 \\ 6 & \quad 8 & = 10 \div 2 \\ 1.5 & \quad 2 & = 2.5 \leftarrow \end{aligned}$$

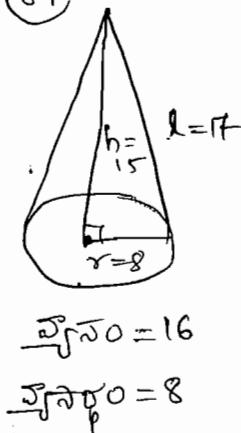


- 2) 5 12 = 13
- 3) 8 15 = 17
- 4) 9 40 = 41
- 5) 10 21 = 29
- 6) 7 24 = 25
- 7) 16 30 = 34
- 8) 14 48 = 50
- 9) 4.5 6 = 7.5

(86)

$$\frac{\text{శిథించు}}{\text{కించు}} = \frac{\frac{1}{3} \pi r_1^2 h_1}{\pi r_2^2 h_2} = \frac{\frac{1}{3} \times 3 \times 3 \times 5}{2 \times 2 \times 4} = \frac{15}{16}$$

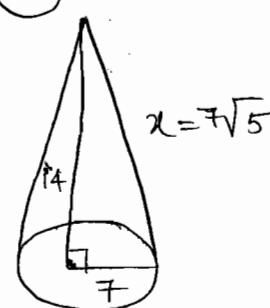
(87)



$$\sqrt{r^2 + h^2} = \sqrt{8^2 + 15^2} = 17$$

$$\sqrt{r^2} = \sqrt{8^2} = 8$$

(88)



$$x^2 = 7^2 + 14^2$$

$$x^2 = 245$$

$$x^2 = 49 \times 5$$

$$x = 7\sqrt{5}$$

$$\text{వస్తుభాగము} = \pi r l + \pi r^2$$

$$= \pi r (l+r)$$

$$= \frac{22}{7} \times 7 (7\sqrt{5}+7)$$

$$= 22 \times 7 (\sqrt{5}+1)$$

$$= 154 (2.23+1)$$

$$= 154 (3.23)$$

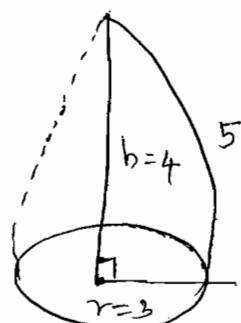
$$= 497.42$$

(89)

$$\text{ఖండము} = \frac{1}{3} \pi r^2 h$$

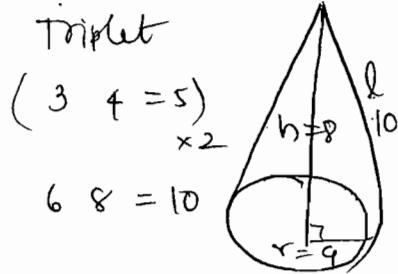
$$= \frac{1}{3} \pi \times 3 \times 3 \times 4$$

$$= 12\pi$$



90

$$\begin{aligned} \text{వర్షాతల} &= \pi r l \\ &= \pi \times 6 \times 10 \\ &= 60\pi \end{aligned}$$



$$\text{వర్షాతల} = \pi r l$$

$$\begin{aligned} &= \frac{22}{7} \times \frac{35}{2} \times 91 \\ &= 110 \times 91 \\ &= 10010 \end{aligned}$$

91

$$V = 1232$$

$$\begin{aligned} \frac{1}{3} \pi r^2 h &= 1232 \\ \cancel{\frac{1}{3}} \times \cancel{\frac{22}{7}} \times r^2 \times \cancel{24} &= \cancel{1232} \\ r^2 &= 49 \\ r &= 7 \end{aligned}$$

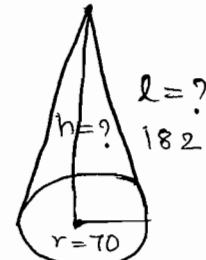


$$\text{వర్షాతల} = 40040$$

$$\pi r l = 40040$$

$$\cancel{\frac{22}{7}} \times \cancel{14} \times l = \cancel{364}^{182}$$

$$l = 182$$



$$(5 \cdot 12 = 13) \times 14$$

$$70 \cdot 168 = 182$$

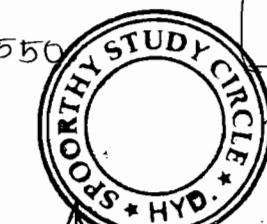
$$\text{వర్షాతల} = \pi r l = \frac{22}{7} \times 7 \times 25 = 550$$

92

$$\text{ప్రా. తల} = 1.54$$

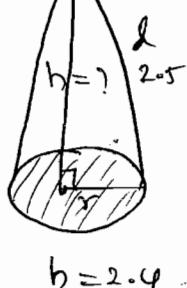
$$\begin{aligned} \pi r^2 &= \frac{154}{100} \\ \cancel{\frac{22}{7}} \times r^2 &= \cancel{154}^{14} \\ r^2 &= \frac{49}{100} \end{aligned}$$

$$r = \frac{7}{10} = r = 0.7$$



$$\text{ప్రా. తల} = \frac{1}{3} \pi r^2 h$$

$$\begin{aligned} &= \frac{1}{3} \times \frac{22}{7} \times 7^2 \times 10 \times \cancel{168}^{56} \\ &= 15400 \times 56 \\ &= 862400 \end{aligned}$$



$$r : h = 3 : 4$$

$$\text{Triplet } 3 \cdot 4 = 5$$

$$\text{Triplet } 7 \cdot 24 = 2.5$$

$$\text{ప్రా. తల} = \frac{1}{3} \pi r^2 h = 96\pi$$

$$= \frac{1}{3} \times 3\pi \times 3^2 \times 4 = 96$$

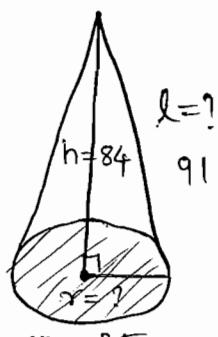
$$x^3 = 8$$

$$x = 2$$



$$l = 5x = 5(2) = 10 \text{ cm}$$

$$\begin{aligned} \pi r^2 &= 3850 \\ \cancel{\frac{22}{7}} \times r^2 &= \cancel{3850}^{175} \\ r^2 &= 7 \times 7 \times 5 \times 5 \\ r &= 7 \times 5 \\ r &= 35 \end{aligned}$$

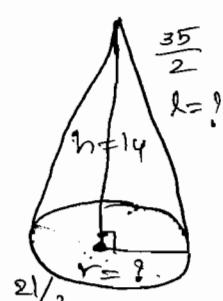


93

$$\pi r^2 = 346.5$$

$$\cancel{\frac{22}{7}} \times r^2 = \cancel{346.5}^{315}$$

$$r^2 = \frac{7 \times 63}{2 \times 2}$$



$$\text{Triplet} = (5 \cdot 12 = 13) \times 7$$

$$35 \cdot 84 = 91$$

$$r^2 = \frac{7 \times 7 \times 3 \times 3}{2 \times 2}$$

$$r = \frac{7 \times 3}{2} = \frac{21}{2}$$

(3	4	= 5	) $\times 7$	Based on Triplet
21	28	= 35	$\div 2$	
$\frac{21}{2}$	14	= $\frac{35}{2}$		

$$= a+b+\frac{ab}{100} = 44\% + 20\% + \frac{44 \times 20}{100}$$

$$= 64 + 8.8$$

$$= 72.8\%$$

(OR)

II.

$$100\text{Rs} \xrightarrow{20\% \uparrow} 120\text{Rs} \xrightarrow{20\% \uparrow} 144 \xrightarrow{20\% \uparrow} 172.8$$

(OR)

III

$$100\text{Rs} \times \frac{120}{100} \times \frac{120}{100} \times \frac{120}{100} = 172.8$$

$$\text{వర్తుల ప్రాణాల్ఫో} = \pi r l$$

$$= \frac{22}{7} \times \frac{21}{2} \times \frac{35}{2}$$

$$= \frac{33 \times 35}{2}$$

$$x \times 1.1 =$$


$$x \times 1.1 = \frac{33 \times 35}{2}$$

$$x \times \frac{11}{10} = \frac{33 \times 35}{2}$$

$$x = 35 \times 15$$

$$x = 525$$



(99)

$$V = \frac{1}{3} \pi r^2 h$$

$$= \underbrace{200\% \uparrow}_{\text{వ్యతి}} , \underbrace{50\% \downarrow}_{\text{వ్యసరథ}} , \underbrace{50\% \downarrow}_{\text{వ్యసరథ}}$$

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

$$= 200 - 50 + \frac{200 \times 50}{100}$$

$$= 150 - 100$$

$$= (50\% \uparrow)$$

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

$$= 50 - 50 + \frac{50 \times 50}{100}$$

$$= -25$$

25% decreased in Volume.

(97)

$$V_1 = \frac{1}{3} \pi r^2 h$$

$$V_2 = \frac{1}{3} \pi (2r)^2 \times 2h$$

$$= 8 \times \frac{1}{3} \pi r^2 h$$

$$= 8 \times (V_1) \rightarrow (8 \text{ times})$$

(100)

$$\frac{\text{దక్కణంపువు}}{\text{మొత్తపుటువు}} = \frac{\frac{1}{3} \pi r^2 h}{\frac{1}{3} \pi r^2 (2h)} = \frac{1}{2}$$

(101)

$$\frac{V_1}{V_2} = \frac{\frac{1}{3} \pi r_1^2 h_1}{\frac{1}{3} \pi r_2^2 h_2} = \frac{\frac{3}{1} \times \frac{3}{1} \times \frac{1}{3}}{\frac{1}{1} \times \frac{1}{1} \times \frac{1}{3}} = \frac{3}{1}$$

(102)

$$V_1 = V_2$$

$$\frac{1}{3} \pi r_1^2 h_1 = \frac{1}{3} \pi r_2^2 h_2$$

$$\frac{h_1}{h_2} = \left( \frac{r_2}{r_1} \right)^2$$

$$r_1 : r_2 = 2 : 1$$

$$r_2 : r_1 = 1 : 2$$

$$\left( \frac{1}{2} \right)^2 = \frac{1}{4}$$

(98)

$$\sqrt{2\%} = \sqrt{\frac{1}{3}} \times r^2 h \quad (3 \text{ వర్షాశాఖలు})$$

$$20\% \uparrow, 20\% \uparrow, 20\% \uparrow$$

$$I) = a+b+\frac{ab}{100}$$

$$= 20+20+\frac{20 \times 20}{100}$$

$$= 44\%$$

$$\textcircled{103} \quad \frac{V_1}{V_2} = \frac{1}{4}$$

$$\frac{\gamma_1^2 h_1}{r_2^2 h_2} = \frac{1}{4}$$

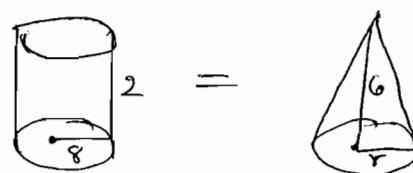
$$\left(\frac{4}{5}\right)^2 \times \frac{h_1}{h_2} = \frac{1}{4}$$

$$\frac{16}{25} \times \frac{h_1}{h_2} = \frac{1}{4} \Rightarrow \frac{h_1}{h_2} = \frac{25}{64}$$

$\frac{d_1}{d_2} = \frac{4}{5}$
$\frac{r_1}{r_2} = \frac{4}{5}$

$$= \frac{34}{18} = \frac{17}{9} \Rightarrow 17:9$$

\textcircled{107}



$$\pi r^2 H = \frac{1}{3} \pi r^2 h$$

$$8 \times 8 \times 2 = \frac{1}{3} \times r^2 \times 6$$

$$r^2 = 64$$

$$r = 8 \text{ cm}$$

\textcircled{104}

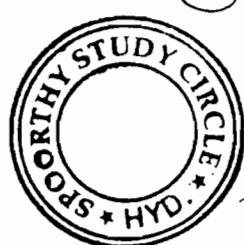
$$\text{ప్ర.భ} = \frac{1}{3} \pi r^2 h$$

$$= \frac{1}{3} \times \cancel{22} \times \cancel{7} \times \cancel{7} \times \cancel{2} \times \cancel{1}$$

$$= \frac{539}{6} =$$

$$= 89.6$$

\textcircled{108}

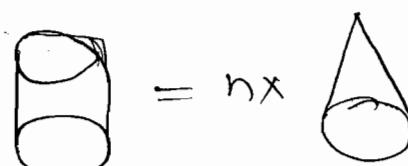


$$\text{cylinder } h = n \times \text{cone } h$$

$$\pi r^2 h = n \times \frac{1}{3} \times \pi r^2 h$$

$$n = 3$$

\textcircled{109}



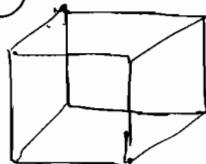
$$\pi r^2 H = n \times \frac{1}{3} \pi r^2 h$$

$$3 \times 3 \times 5 = n \times \frac{1}{3} \times \frac{1}{10} \times \frac{1}{10} \times 1$$

$$n = 13500$$

$$1 \text{ mm} = \frac{1}{10} \text{ cm}$$

\textcircled{105}



$$V = 16 \times 6 \\ = 10 \times 5 \times 2 \\ V = 100$$

$$V = \frac{1}{3} \pi r^2 h \\ = \frac{1}{3} \times \cancel{22} \times \cancel{3} \times \cancel{3} \times \cancel{1} \\ = 66$$

So, 34% తగ్గింది.

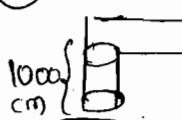
\textcircled{106}



$$r:h = 5:12$$



\textcircled{110}



$$\text{వ్యాసం} = 5 \text{ mm}$$

$$\text{వ్యాసము} = \frac{5}{2} \text{ mm}$$

$$= \frac{5}{2} \times \frac{1}{10} = \frac{1}{4} \text{ cm}$$

$$\rightarrow \text{ప్ర.భ} = \frac{1}{3} \pi r^2 H$$

$$\text{వ్యాసం} = 10 \text{ mm/min} \Rightarrow 1000 \text{ cm/min}$$

1 రిహితంలో 1000 cm పొడవున నుండి అపాశిస్తాడి.

1 రిహితం ల్లో వ్యాసంలో నీటి ప్ర.భ =  $\pi r^2 h$

$$\frac{\text{వ్యాసము}}{\text{వ్యాసము}} = \frac{2\pi r(h+r)}{\pi r(l+r)} \\ = \frac{2(12x+5x)}{13x+5x}$$

$$\text{Cone} = n \times \text{Base}$$

$$\frac{108, 81, 64, 60}{4 \quad 3 \quad 2 \quad 1}$$

$$\frac{1}{3} \pi R^2 H = n \times \pi r^2 h$$

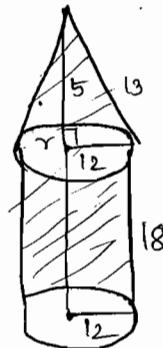
$$\frac{1}{3} \times 20 \times 20 \times 24 = n \times \frac{1}{4} \times \frac{1}{4} \times 1000$$

$$n = \frac{4 \times 4 \times 8 \times 2}{5}$$

$$n = \frac{256}{5} = 51 \frac{1}{5} \Rightarrow$$

$$= 51 \text{ పుణీ } \frac{1}{5} \times 60$$

$$= 51 \text{ పుణీ } 12 \text{ సెమీ.}$$



$$5 \cdot 12 = 13$$

Pythagorean triplet

$$\text{కొత్త ప్రాంతం} = \text{శంఖపు వ్యాఖ్యలు} + \text{స్ఫూర్టింగ్ వ్యాఖ్యలు \\ + \text{స్థాపనాలు}$$

$$= \pi R L + 2\pi R H + \pi R^2$$

$$= \pi (12 \times 13 + 2 \times 12 \times 18 + 12 \times 12)$$

$$= 12\pi (13 + 36 + 12)$$

$$= 12\pi (61)$$

$$= 12 \times \frac{22}{7} \times 61$$

$$= \frac{16104}{7} = 2300 \frac{4}{7}$$

(12)

$$1) \text{ lbb} = 5 \times 3 \times 4 = 60$$

$$2) a^3 = 4^3 = 64$$

$$3) \text{ If } V = \pi r^2 h = 3.14 \times 3 \times 3 \times 3 = 81$$

$$4) \text{ If } V = \frac{4}{3} \pi r^3$$

$$= \frac{4}{3} \times 3.14 \times 3 \times 3 \times 3 = 108$$

Sphere (స్ఫోర్స్ పుణీ):

$$1) \text{ వ్యాఖ్యలు } / \text{ నొఱితులు } = 4\pi R^2$$

$$2) \text{ పుణీ } = \frac{4}{3} \pi R^3.$$

$$\text{స్ఫోర్స్ పుణీ} = 4851$$

$$\frac{4}{3} \pi R^3 = 4851$$

$$\frac{4}{3} \times \frac{22}{7} \times R^3 = 4851$$

$$R^3 = \frac{21 \times 21 \times 21}{2 \times 2 \times 2}$$

$$R = \frac{21}{2}$$

$$\text{వ్యాఖ్యలు } / = 4\pi R^2$$

$$= 4 \times \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2} \times \frac{21}{2}$$

$$= 1386$$

(14)

$$4\pi R^2 = 5544$$

$$4 \times \frac{22}{7} \times R^2 = 5544$$

$$R^2 = 7 \times 1 \times 3 \times 3$$

$$R = 21$$

$$V = \frac{4}{3} \pi R^3$$

$$= \frac{4}{3} \times \frac{22}{7} \times 21 \times 21 \times 21$$

$$= 88 \times 441$$

$$= 38808$$

$$\text{స్ఫోర్స్ వ్యాఖ్యలు } \times K = \text{ పుణీ}$$

$$4\pi R^2 \times K = \frac{4}{3} \pi R^3$$

$$K = \frac{R}{3}$$

$$16) \frac{\text{గొట్ట పు.వ}}{\text{గొట్ట వర్తులు}} = 27$$

$$= \frac{\frac{4}{3}\pi R^3}{4\pi R^2} = 27$$

$$= \frac{R}{3} = 27 \Rightarrow R = 81$$

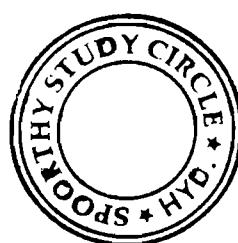
117)

$$\frac{A \text{ వర్తుల}}{B \text{ వర్తుల}} = \frac{4\pi r_1^2}{4\pi r_2^2} = \left(\frac{40}{10}\right)^2 = \frac{16}{1}$$

118)

$$A_1 = 4\pi r^2 = 2464$$

$$\begin{aligned} A_2 &= 4\pi (2r)^2 \\ &= 4(4\pi r^2) \\ &= 4(2464) \\ &= 9856 \end{aligned}$$



119)

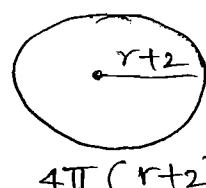
$$V_1 = \frac{4}{3}\pi r^3$$

$$\begin{aligned} V_2 &= \frac{4}{3}\pi (2r)^3 \\ &= 8\left(\frac{4}{3}\pi r^3\right) \\ &= 8(V_1) \end{aligned}$$

120)



$$4\pi r^2$$



$$4\pi(r+2)^2$$

$$4\pi((r+2)^2 - r^2) = 352$$

$$4 \times \frac{22}{7} (4r+4) = 352$$

$$\frac{4}{7}(r+1) = 4$$

$$r+1 = 7$$

$$r = 6$$

121)

$$\text{గొట్ట పు.వ} = \frac{4}{3}\pi r^3 \rightarrow \text{అస్తిత్వ}$$

$$r = 1 : 5\% \uparrow,$$

$$1.05\% \uparrow, 1.05\% \uparrow$$

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

$$= 1.5 + 1.5 + \frac{1.5 \times 1.5}{100}$$

$$= 3 + 0.0225$$

$$= 3.0225 \approx 3$$

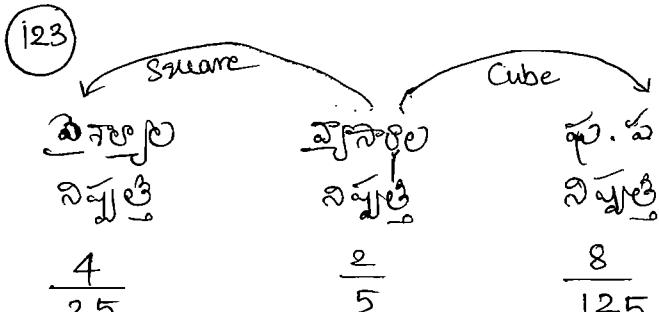
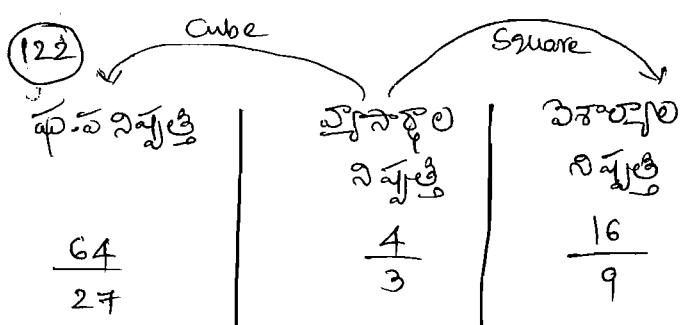
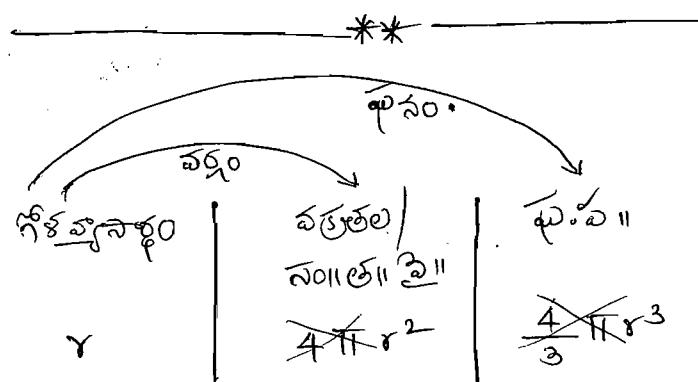
$$15\% \uparrow$$

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

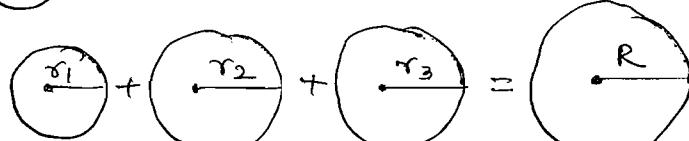
$$= 3 + 1.5 + \frac{3 \times 1.5}{100}$$

$$= 4.5 + 0.045$$

$$= 4.545 \approx 4.6$$



124)



$$\frac{4}{3}\pi(r_1^3 + r_2^3 + r_3^3) = \frac{4}{3}\pi R^3$$

$$6^3 + 8^3 + 10^3 = R^3$$

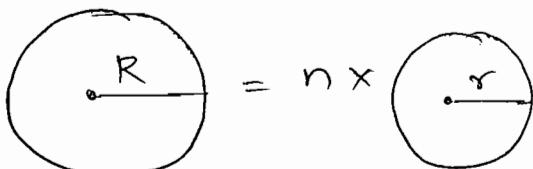
$$R^3 = 216 + 512 + 1000$$

$$R^3 = 1728$$

$$R = 12$$

$$\sqrt[3]{10} \times 10 = 24$$

125

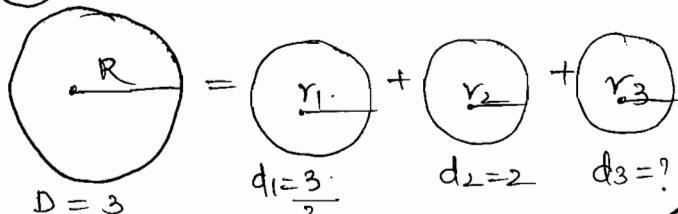


$$\frac{4}{3}\pi R^3 = n \times \frac{4}{3}\pi r^3$$

$$8 \times 8 \times 8 = n \times 2 \times 2 \times 2$$

$$n = 64$$

126



$$\frac{4}{3}\pi R^3 = \frac{4}{3}\pi(r_1^3 + r_2^3 + r_3^3)$$

$$\left(\frac{3}{2}\right)^3 = \left(\frac{3}{4}\right)^3 + 1^3 + r^3$$

$$\frac{27}{8} = \frac{27}{64} + 1 + r^3$$

$$\frac{27}{8} = \frac{91}{4} + r^3$$

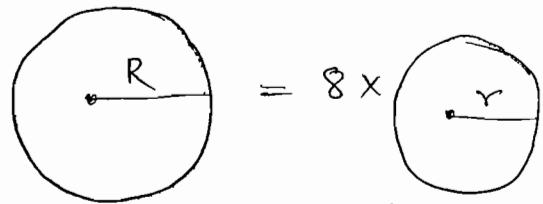
$$r^3 = \frac{27 - 91}{8} = \frac{216 - 91}{64}$$

$$r^3 = \frac{125}{64} = \frac{5^3}{4^3}$$

$$\sqrt[3]{\frac{5}{4}} = \frac{5}{4}$$

$$\sqrt[3]{10} \times 10 = \frac{5}{4} \times 2 = 2.5$$

127



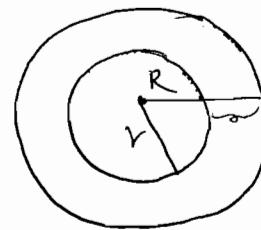
$$\frac{4}{3}\pi R^3 = 8 \times \frac{4}{3}\pi r^3$$

$$10 \times 10 \times 10 = 8 \times r^3$$

$$r^3 = 5^3$$

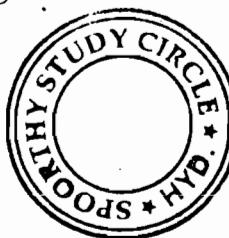
$$r = 5$$

128



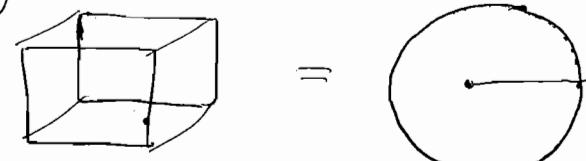
$$\begin{aligned} \text{వ్యాసం } D &= 6 \\ \text{వ్యాసార్థ } R &= 3 \\ \text{అపలవ్యాసార్థ } &= 3 - \frac{1}{2} = 2 \frac{1}{2} = \frac{5}{2} \end{aligned}$$

చెంగికొకు ఫండ్ = దియంగొకొకు ఫండ్ - అపలగొకొకు ఫండ్



$$\begin{aligned} &= \frac{4}{3}\pi R^3 - \frac{4}{3}\pi r^3 \\ &= \frac{4}{3}\pi \left( 3^3 - \left(\frac{5}{2}\right)^3 \right) \\ &= \frac{4}{3} \times \frac{22}{7} \left( 27 - \frac{125}{8} \right) \\ &= \frac{4}{3} \times \frac{22}{7} \left( \frac{216 - 125}{8} \right) \\ &= \frac{4}{3} \times \frac{22}{7} \times \frac{91}{8} \\ &= \frac{143}{21} \Rightarrow 47 \frac{2}{3} \end{aligned}$$

129



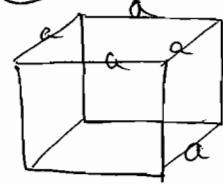
$$l b h = \frac{4}{3}\pi R^3$$

$$49 \times 33 \times 24 = \frac{4}{3} \times \frac{22}{7} \times R^3$$

$$R^3 = 7^3 \times 3^3$$

$$\begin{aligned} R &= 7 \times 3 \\ &= 21 \end{aligned}$$

30



$$= n \times \text{Area of circle} = n \times \pi R^2$$

$\text{వ్యాస} = 2\text{cm}$   
 $\text{వ్యాఖ్య} =$   
 $R = 1\text{cm}$

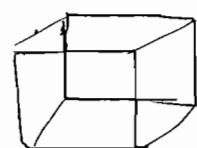
$$a^3 = n \times \frac{4}{3} \pi R^3$$

~~$$22 \times 22 \times 22 = n \times \frac{4}{3} \times \frac{22}{7} \times 1 \times 1 \times 1$$~~

$$n = 121 \times 21$$

$$n = 2541$$

31



$$= n \times \text{Area of circle} = n \times \pi R^2$$

$\text{వ్యాస} = 3\text{mm}$   
 $\text{వ్యాఖ్య} = \frac{3}{2}\text{mm}$

$$l b h = n \times \frac{4}{3} \pi R^3$$

$\text{వ్యాఖ్య} = \frac{3}{2} \times \frac{1}{10} \text{cm}$   
 $= \frac{3}{20} \text{cm}$

~~$$9 \times 11 \times 12 = n \times \frac{4}{3} \times \frac{22}{7} \times \frac{3}{20} \times \frac{3}{20} \times \frac{3}{20}$$~~

$$n = 3 \times 1 \times 10 \times 20 \times 20$$

$$n = 84000$$



32

$$\text{వ్యాస} = \text{cube side}$$

$$\frac{4}{3} \pi r^3 = \frac{4}{3} a^3$$

$$\frac{r^3}{a^3} = \frac{3}{2\pi}$$

$$\frac{r}{a} = \sqrt{\frac{3}{2\pi}}$$

$$\frac{\text{Area of circle}}{\text{Area of square}} = \frac{\frac{4}{3} \pi r^3}{a^3}$$

$$= \frac{4}{3} \pi \times \frac{r^2}{a^2} \times \frac{r}{a}$$

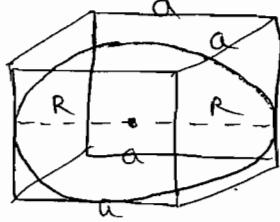
$$= \frac{4}{3} \pi \times \frac{3}{2\pi} \times \sqrt{\frac{3}{2\pi}}$$

$$= 2 \sqrt{\frac{3}{2\pi}}$$

$$= \sqrt{\frac{4 \times 3}{2\pi}}$$

$$= \sqrt{\frac{6}{\pi}}$$

133



$$2R = a$$

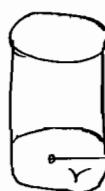
$$R = \frac{a}{2}$$

$$\frac{\text{Area of square}}{\text{Area of circle}} = \frac{a^3}{\frac{4}{3} \pi R^3}$$

$$= \frac{a^3}{\frac{4}{3} \pi \left(\frac{a}{2}\right)^3}$$

$$= \frac{a^3}{\frac{4\pi}{3} \left(\frac{a^3}{8}\right)} \Rightarrow \frac{6}{\pi}$$

134



$$\text{వ్యతిలక్షీ} = \text{Area of circle} \times \text{height}$$

$$\text{వ్యతి} = 12$$

$$\text{వ్యాస} = 12$$

$$\text{వ్యాఖ్య} = 6$$

~~$$2\pi r h = \frac{1}{4} \pi R^2$$~~

~~$$6 \times 12 = \frac{1}{4} \times R^2$$~~

$$R^2 = 36$$

$$R = 6$$

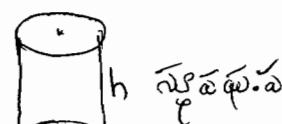
135

$$\text{వ్యతి} = \text{Area of circle} \times \text{height}$$

$$\text{వ్యాస} = 14$$

$$\text{వ్యాఖ్య} = 7$$

$$\text{వ్యవధి} = 28$$



$$\text{వ్యతి} = 2\frac{1}{3}$$

$$= 7/3$$

$$\text{వ్యాస} = ?$$

$$\frac{4\pi r^3}{3} = \pi r^2 h$$

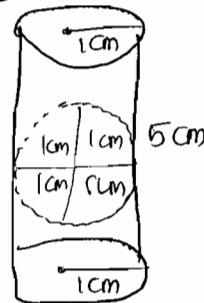
$$\frac{4}{3} \times 7 \times 7 \times \frac{1}{3} = r^2 \times \frac{1}{3}$$

$$r^2 = 7 \times 7 \times 2 \times 2$$

$$r = 7 \times 2$$

$$r = 14$$

136



$$\pi r^2 h = 1$$

$$\begin{aligned} \frac{4}{3} \pi r^3 &= \frac{4}{3} \pi R^3 \\ &= \frac{4}{3} \pi \times 1 \times 1 \\ &= \frac{4}{3} \pi \end{aligned}$$

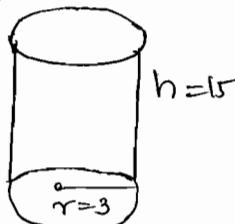
$$\frac{4}{3} \pi R^3 = \pi r^2 h$$

$$\frac{4}{3} \times 4 \times 4 \times 4 = \frac{3}{20} \times \frac{3}{20} \times h$$

$$h = \frac{102400}{27}$$

$$h = 37.92$$

137



$$h = 15$$

$$= n \times \pi r^2$$

$$\sqrt{\pi} r^2 = 5 \text{ mm}$$

$$\pi r^2 h = h \times \frac{4}{3} \pi R^3$$

$$3 \times 3 \times 15 = n \times \frac{4}{3} \times \frac{1}{4} \times \frac{1}{4} \times \frac{1}{4}$$

$$48 \times 135 = n$$

$$n = 6480$$

$$\pi r^2 h = \frac{5}{2} \text{ mm}$$

$$\begin{aligned} &= \frac{5}{2} \times \frac{1}{10} \text{ cm} \\ &= \frac{1}{4} \text{ cm} \end{aligned}$$

140

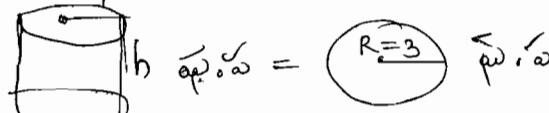


present water level  
previous water level

present water level  
previous water level

$$\text{ಸಾರ್ಥಕ ಪದಂಜಲಿ} = \text{ವಾತಾವರಣ - ಸ್ವಾಧೀನ ವಿಷಯ}$$

ಸಾರ್ಥಕ ಪದಂಜಲಿ = ಸ್ವಾಧೀನ ವಿಷಯ

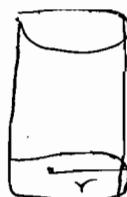


$$\pi r^2 h = \frac{4}{3} \pi R^3$$

$$4 \times 4 \times h = \frac{4}{3} \times 3 \times 3 \times 3$$

$$h = \frac{9}{4}$$

141



$$= 2 \times \pi r^2$$

$$\sqrt{\pi} r^2 = ?$$

$$\text{ಒತ್ತು} = 2$$

$$\sqrt{\pi} r^2 = 16$$

$$\sqrt{\pi} r^2 = 8$$

$$\pi r^2 h = 12 \times \frac{4}{3} \pi R^3$$

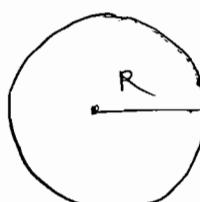
$$8 \times 8 \times 2 = 12 \times \frac{4}{3} \times R^3$$

$$R^3 = 8$$

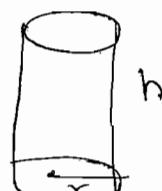
$$R = 2$$

$$\sqrt{\pi} r^2 D = 4 \text{ cm}$$

139



$$=$$



$$h$$

$$\sqrt{\pi} r^2 = 8 \text{ cm}$$

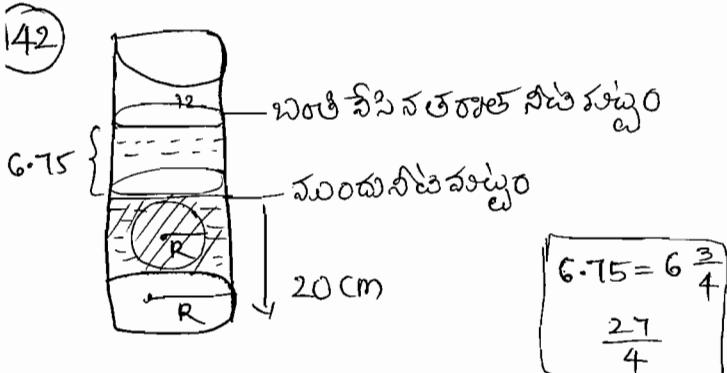
$$\sqrt{\pi} r^2 = 3 \text{ mm}$$

$$\sqrt{\pi} r^2 = 4 \text{ cm}$$

$$\sqrt{\pi} r^2 = \frac{3}{2} \text{ mm}$$

$$= \frac{3}{2} \times \frac{1}{10} \text{ cm}$$

$$r = \frac{3}{20} \text{ cm}$$



145

$\frac{1}{3} \pi r^2 h = n \times \frac{4}{3} \pi R^3$

$12 \times 12 \times 24 = n \times 4 \times 2 \times 2 \times 2$

$n = 108$

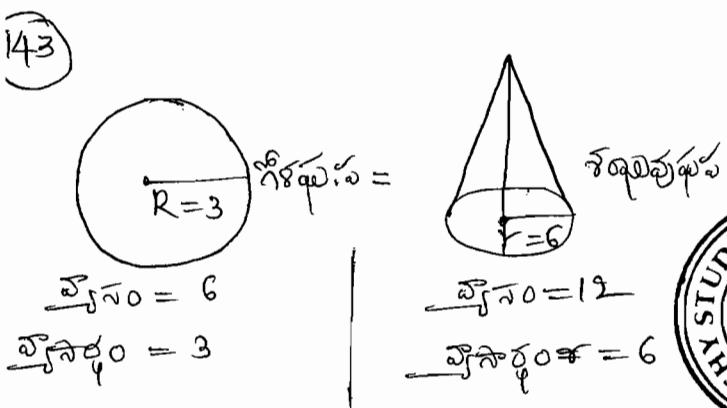
అంతి ఘ.ప. = దింతి ఘ.ప.

$$\pi r^2 h = \frac{4}{3} \pi R^3$$

$$12 \times 12 \times \frac{27}{4} = \frac{4}{3} \pi R^3$$

$$R^3 = (9)^3$$

$$R = 9$$



146

ఉపయోగిస్తామా = 8

$\sqrt{r^2} = 4$

$\sqrt{R^2 - r^2} = 4$

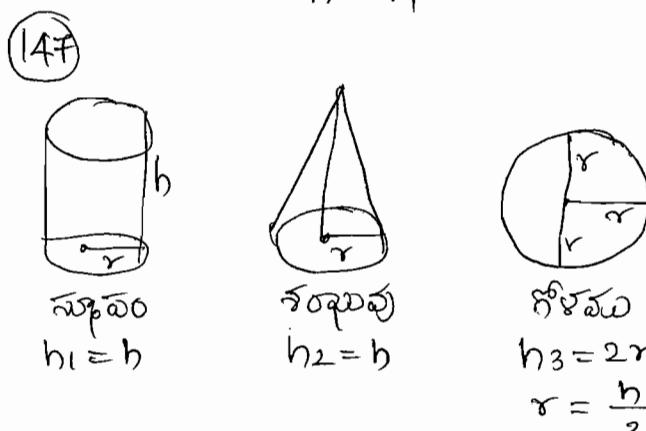
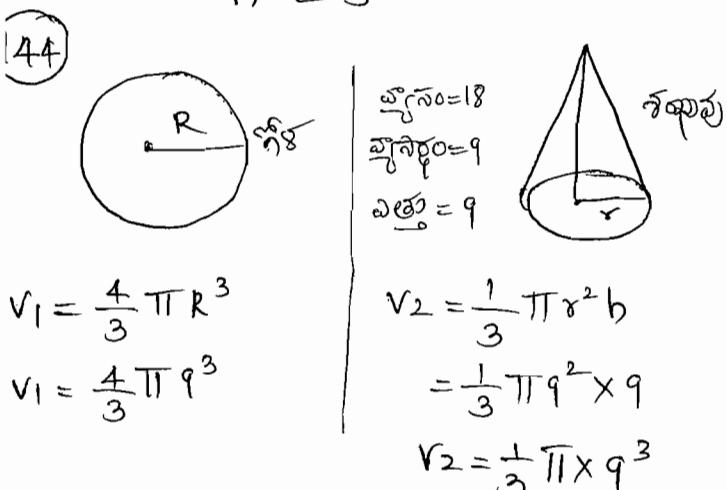
$\sqrt{h^2} = 2$

$\frac{4}{3} \pi (R^3 - r^3) = \frac{1}{3} \pi r^2 h$

$4(4^3 - 2^3) = 4 \times 4 \times h$

$56 = 4h$

$h = 14$



$V_1 : V_2 : V_3 = \pi r^2 h : \frac{1}{3} \pi r^2 h : \frac{4}{3} \pi r^3$

$= h : \frac{h}{3} : \frac{4}{3} \times h$

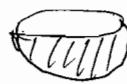
$= (1 : \frac{1}{3} : \frac{2}{3}) \times 3 \text{ చిట్టా}$

$= 4 : \frac{1}{3} : \frac{2}{3}$

$= 3 : 1 : 2$

## Hemi Sphere (ଅର୍ଦ୍ଧଗୋଟିମ୍):-

1). ପରିଚାଳନା ପରିଚାଳନା  $= 2\pi R^2$



2) ନିର୍ମାଣ ପରିଚାଳନା  $= 3\pi R^2$



3) ଘର୍ଷଣା  $= \frac{2}{3} \pi R^3$

\*\*

148) କ୍ଷେତ୍ରଫଳ  $= 14$

ପରିଚାଳନା  $= 7$

ଅର୍ଦ୍ଧଗୋଟିମ୍ ପରିଚାଳନା  $= 3\pi R^2$

$$= 3 \times \frac{22}{7} \times 1 \times 7 \\ = 462$$

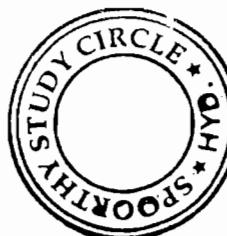
149) ଅର୍ଦ୍ଧଗୋଟିମ୍ ଘର୍ଷଣା  $= 19404$

$\frac{2}{3} \pi R^3 = 19404$

$\frac{2}{3} \times \frac{22}{7} \times R^3 = 19404$

$R^3 = (21)^3$

$R = 21$



150)

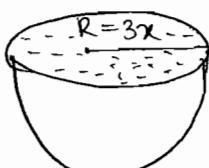
ଘର୍ଷଣା

$$\frac{64}{216} = \frac{4^3}{6^3}$$

କ୍ଷେତ୍ରଫଳ  $\frac{4}{6} = \frac{2}{3}$

କ୍ଷେତ୍ରଫଳ  $\left(\frac{2}{3}\right)^2 = \frac{4}{9}$

151)

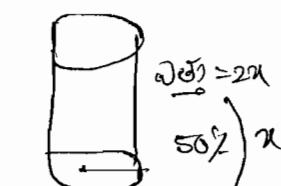


ଘର୍ଷଣା  $= \frac{2}{3} \pi R^3$

$V_1 = \frac{2}{3} \pi (3x)^3$

$V_1 = \frac{2}{3} \pi 27x^3$

$V_1 = 18\pi x^3$



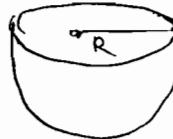
ଘର୍ଷଣା  $= 2\pi r^2 h$

$V_2 = \pi (3x)^2 2x$

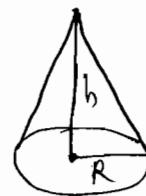
$V_2 = 18\pi x^3$

100%

152)



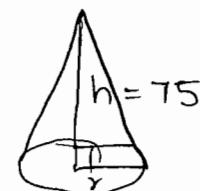
=



153)



=



$$\frac{2}{3} \pi R^3 = \frac{1}{3} \pi r^2 h$$

$$2 \times 6 \times 6 \times 6 = r^2 \times 75$$

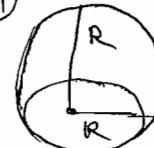
$$r^2 = \frac{6 \times 6 \times 2 \times 2}{5 \times 5}$$

$$r = \frac{6 \times 2}{5}$$

$$r = \frac{12}{5}$$

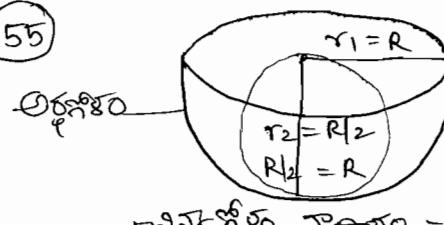
$$r = 2.4$$

154)



$$\frac{\text{ପରିଚାଳନା}}{\text{ପରିଚାଳନା}} = \frac{2\pi R^2}{\pi r l} = \frac{2\pi R^2}{\pi R \times \sqrt{2} R} = \frac{2}{\sqrt{2}} = \frac{\sqrt{2}}{1}$$

155)



ଅର୍ଦ୍ଧଗୋଟିମ୍ କ୍ଷେତ୍ରଫଳ  $= \frac{R}{2}$

$$\frac{\text{ପରିଚାଳନା}}{\text{ପରିଚାଳନା}} = \frac{\frac{2}{3} \pi r_1^3}{\frac{2}{3} \pi r_2^3}$$

$$= \frac{1}{2} \times \frac{R^3}{R^3}$$

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

$$= \frac{4}{1}$$

) 30 cm వ్యాసమై, 50 cm ఎత్తుగఠ శంకువును  
రాసి పై ఆగినందుండి 10 cm వొడవున్న లఘుతరంగి  
ధండినే విగిలన సంఘావు ఫ్రెన్ పోల్ వొమ్మా  
ట్ స్కూల్ ను?

