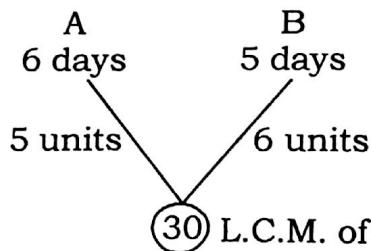


Answers with explanation

1.2; Paramount concept:-



$$B \text{ get} = \frac{6}{11} \times 220 = 6 \times 20 = ₹ 120/-$$

Other method:

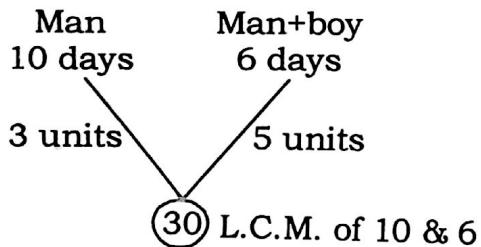
A can complete the work in 6 days.
B can complete the work in 5 days.
We know that there is inverse relation between time and work. And amount of ₹ 220 will be distributed in the ratio of their work.

Since, A's time : B's time = 6 : 5

A's work : B's work = 5 : 6

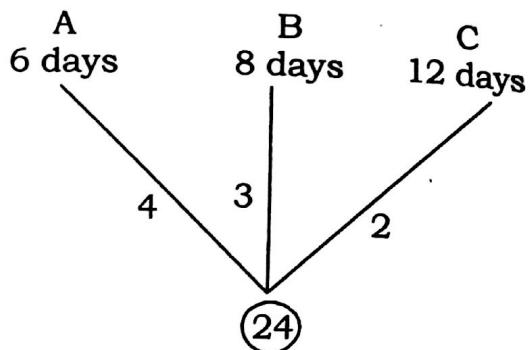
$$B \text{ will get an amount} = \frac{6}{11} \times 220 = ₹ 120$$

2.1; Paramount concept:-



$$\text{Share of boy} = \frac{2}{5} \times 50 = ₹ 20/-$$

3.3; Paramount concept:-



$$\text{share of B} = \frac{3}{4+3+2} \times 1350$$

$$= \frac{3}{9} \times 1350 = 3 \times 150 = ₹ 450/-$$

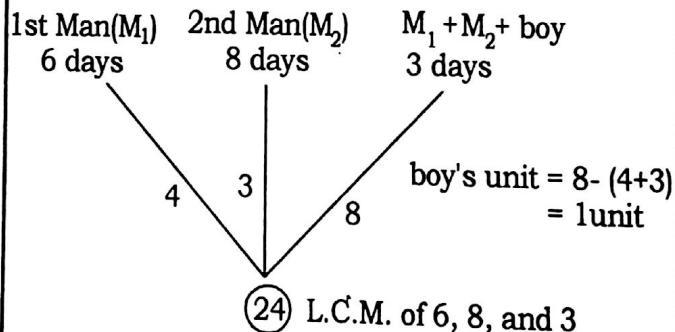
4.1; Suppose that total work is 11 units

As we go according to question A + B finish 7 units

It means C will finish the remaining 4 units.

$$C \text{ will get an amount} = \frac{4}{11} \times 550 = ₹ 200/-$$

5.2; Paramount concept:-



(24) L.C.M. of 6, 8, and 3

The boy does 8 - (4+3) units
= 1 unit out of (4 + 3 + 1) i.e. 8 units

$$\text{Boy's share} = \frac{1}{8} \times 200 = ₹ 25$$

6.1; 45 w $\xrightarrow{48 \text{ days}} ₹ 15525$

$\Rightarrow 45 w \xrightarrow{1 \text{ day}} ₹ \frac{15525}{48}$

$\Rightarrow 1 w \xrightarrow{1 \text{ day}} ₹ \frac{15525}{48 \times 45}$

$$\text{Daily wage of } 1w = \text{₹} \frac{15525}{48 \times 45} = \text{₹} \frac{115}{16}$$

Daily wage of 1 Man = $2 \times$ daily wage of 1 woman

$$= 2 \times \text{₹} \frac{115}{16} = \text{₹} \frac{115}{8}$$

$$\text{Req. no. of men} = \text{₹} \frac{5750}{\frac{115}{8} \times 16} = 25 \text{ men}$$

Other Method:-

	Days	Amount (work)	Wages (Efficiency)
45 W	48	15525	1
? men	16	5750	2

$$\therefore M_1 D_1 E_1 W_2 = M_2 D_2 E_2 W_1$$

Required number of men

$$= \frac{45}{1} \times \frac{48}{1} \times \frac{5750}{15525} \times \frac{1}{2} = 25$$

$$7.2; \quad 3 \text{ men} + 4 \text{ boys} \xrightarrow{7 \text{ days}} 756$$

$$3m + 4b \xrightarrow{1 \text{ day}} \frac{756}{7} = 108 \quad \text{(i)}$$

$$11m + 13b \xrightarrow{8 \text{ day}} 3008$$

$$11m + 13b \xrightarrow{8 \text{ day}} \frac{3008}{8} = 376 \quad \text{(ii)}$$

To solve equation (i) & (ii) we have to make either the no. of men or no. of boys equal.

$$\times 11 (3m + 4b = 108)$$

$$\times 3 (11m + 13b = 376)$$

$$33m + 44b = 1188$$

$$-33m + 39b = 1128$$

$$5b = 60$$

$$1b = 12/-$$

Substituting the value of b in any one of the equation (i) or (ii), we can find the daily wage of 1 man.

$$3m + 4b = 108$$

$$3m + 4 \times 12 = 108$$

$$3m + 48 = 108$$

$$3m = 108 - 48$$

$$3m = 60$$

$$1m = 20/-$$

$$7m = 7 \times 20 = 140/-$$

$$1b = 12/-$$

$$9b = 9 \times 12 = 108/-$$

$$7m + 9b = 1 \text{ day} = 140 + 108 = 248$$

248 in 1 day

$$2480 \text{ in } \frac{1}{248} \times 2480 = 10 \text{ days}$$

$$8.1; (A + B + C) \text{ earns an amount of } \frac{1350}{9}$$

= ₹ 150 in a day

(A + C) earn an amount of ₹ 94 in a day.

(B + C) earn an amount of ₹ 76 in a day.

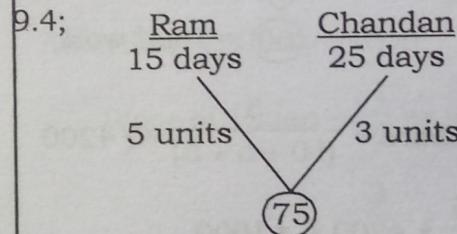
C's per day earning = (A + B + C) + C

$$- (A + B + C)$$

$$= (76 + 94) - 150$$

$$= 170 - 150 = 20$$

∴ Daily earning of C is ₹ 20



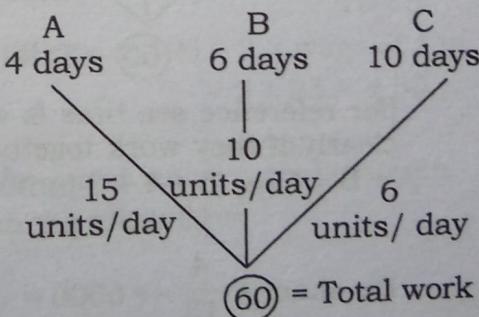
$$\text{Ratio} = 5 : 3$$

Short cut Method :-

Time and work are inversely proportional to each other.

So, ratio of earnings will be 25 : 15 or 5 : 3

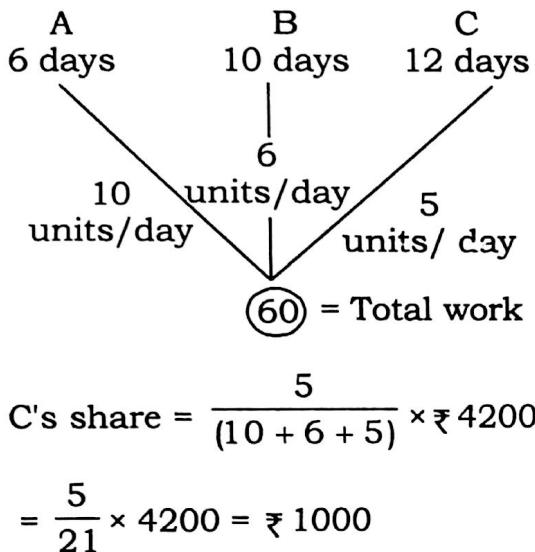
10.1; Paramount concept:-



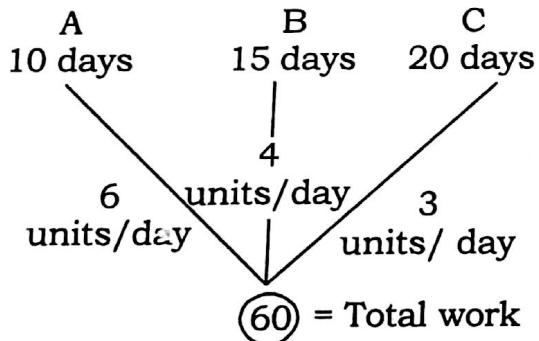
$$\begin{aligned} A's \text{ share} &= \frac{15}{(15+10+6)} \times ₹310 \\ &= \frac{15}{31} \times ₹310 = ₹150 \end{aligned}$$

$$\begin{aligned} B's \text{ share} &= \frac{10}{31} \times ₹310 = ₹100 \\ C's \text{ share} &= \frac{6}{31} \times ₹310 = ₹60 \end{aligned}$$

11.3; Paramount concept:-



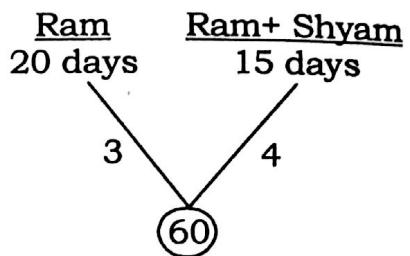
12.1; Paramount concept:-



[for reference see time & work]
clearly if they work together
 $A + B + C \rightarrow (6 + 4 + 3) \text{ units / day} = 13 \text{ units per day}$

$$B's \text{ share} = \frac{4}{13} \times ₹6500 = ₹2000$$

13.1; Paramount concept:-

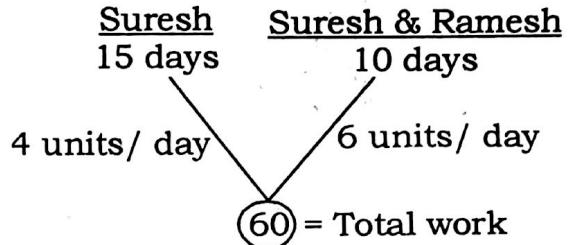


Ram does 3 units.
Shyam does = $4 - 3 = 1$ unit (as given that R + S does 4 units)
 $R : S = 3 : 1$

$$\text{Ram gets} = \frac{3}{4} \times 400 = ₹300/-$$

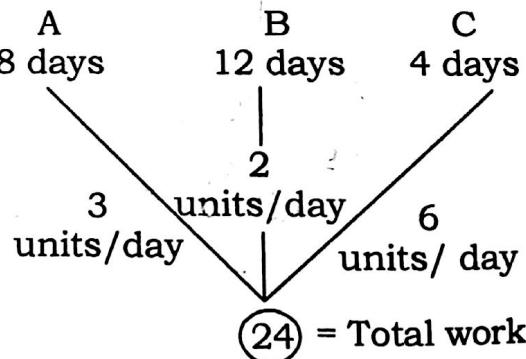
$$\text{Shyam gets} = \frac{1}{4} \times 400 = ₹100/-$$

14.1; Paramount concept:-



Cleary, Ramesh efficiency = 2 units/ day
Suresh efficiency = 4 units/ day
So, the money will be distributed in same ratio i.e. 4 : 2 or 2 : 1
So, their shares are ₹1000, ₹500

15.4; Paramount concept:-



Clearly, efficiency of C = $(6 - 3 - 2)$ units/ days = 1 unit /days

$$\therefore C's \text{ share} = \frac{1}{6} \times 300 = ₹50$$

16.3; Paramount concept:-

$$A+B \longrightarrow \frac{8}{11}^{\text{th}} \text{ of the work}$$

Let the work be 11 units
So, A+B did 8 units.

Thus, C does $(11 - 8) = 3$ units

$$\therefore \text{C's share} = \frac{3}{11} \times ₹ 660 = ₹ 180$$

17.1; Paramount concept:-

$$A+B+C \longrightarrow ₹ 707 \text{ (Payment)}$$

$$A+B \longrightarrow \frac{5}{7} \text{ of the work}$$

Let the work be 7 units
Then, clearly C did remaining $(7 - 5) = 2$ units.

Now, we know that there is direct relation between work and wages.

$$\text{So, C will get} = \frac{2}{7} \times ₹ 707 = ₹ 202/-$$

18.1; Paramount concept:-

$$A+B+C \xrightarrow{\text{wages}} ₹ 480$$

$$A+B \longrightarrow \frac{1}{4}^{\text{th}} \text{ of the work}$$

Let total work be 4 units

Clearly C did the remaining $(4 - 1)$ unit
 $= 3$ units.

Work and wages have direct relationship.

$$\text{So, payment of C} = \frac{3}{4} \times ₹ 480 = ₹ 360$$

$$19.2; 45w \longrightarrow 48 \text{ days} \longrightarrow ₹ 46575$$

$$\therefore 1w \longrightarrow 48 \text{ days} \longrightarrow ₹ \frac{46575}{45}$$

$$\therefore 1w \longrightarrow 1 \text{ day} \longrightarrow ₹ \frac{46575}{45 \times 48} \text{ (wages)}$$

Now, according to question

wage of 1 M = $2 \times$ wage of 1 w

$$= \frac{2 \times 46575}{45 \times 48} = \frac{345}{8} / \text{day}$$

$$\text{Req. no} = \frac{17250}{\frac{345}{8} \times 16} = 25 \text{ men}$$

Short cut:-

	<u>Amount</u> <u>(work)</u>	<u>Days</u>	<u>Wages</u> <u>(Efficiency)</u>
45 Women	46575	48	1
x men	17250	16	2

$$\therefore M_1 D_1 E_1 W_1 = M_2 D_2 E_2 W_2$$

Therefore, required number of men

$$x = \frac{45 \times 17250 \times 48 \times 1}{46575 \times 16 \times 2} = 25$$

$$20.4; \text{Wage of 20 boys} \longrightarrow 15 \text{ days} \longrightarrow ₹ 9000$$

$$\therefore 1 \text{ boy} \longrightarrow 15 \text{ days} \longrightarrow \frac{9000}{20}$$

$$\Rightarrow 1 \text{ boy} \longrightarrow 1 \text{ day} \longrightarrow \frac{9000}{20 \times 15} = ₹ 30$$

According to the question

$$\text{Wage of 1 man} = 1 \frac{1}{2} = \times \text{wage of 1 boy}$$

$$= \frac{3}{2} \times ₹ 30 = ₹ 45$$

$$\text{Req. no.} = \frac{13500}{45 \times 30} = 10 \text{ men}$$

$$21.3 \text{ Wage of } 10 \text{ w} \longrightarrow 5 \text{ days} \longrightarrow ₹ 1250$$

$$\therefore 1 \text{ w} \longrightarrow 5 \text{ days} \longrightarrow ₹ \frac{1250}{10}$$

$$\Rightarrow 1 \text{ w} \longrightarrow 1 \text{ day} \longrightarrow ₹ \frac{1250}{10 \times 5} = ₹ 25$$

$$\begin{aligned} \text{Wage of 1 M} &= 2 \times \text{wage of 1 w} \\ &= 2 \times 25 = ₹ 50 \end{aligned}$$

$$\text{Required no.} = \frac{1600}{50 \times 8} = 4 \text{ men}$$

$$22.4 \quad 5m + 7B \xrightarrow{6 \text{ days}} ₹ 3825$$

$$\Rightarrow 5m + 7B \xrightarrow{1 \text{ day}} ₹ \frac{3825}{6} = ₹ 637.5$$

$$5m + 7B \xrightarrow{1 \text{ day}} ₹ 637.5 \quad \text{(i)}$$

$$2m + 3B \xrightarrow{4 \text{ days}} ₹ 1050$$

$$\Rightarrow 2m + 3B \xrightarrow{1 \text{ day}} ₹ 262.5 \quad \text{(ii)}$$

To solve equ. (i) & (ii) we have to make either the no. of men or no. of boys equal.

Thus,

$$2 \times (5m + 7B) \rightarrow ₹ 637.5 \times 2$$

$$2 \times (2m + 3B) \rightarrow ₹ 262.5 \times 5$$

$$10m + 14B \rightarrow ₹ 1275 \quad \text{(iii)}$$

$$10m + 15B \rightarrow ₹ 1312.5 \quad \text{(iv)}$$

Subtracting (iii) from (iv)

$$1B \rightarrow ₹ 37.5 / \text{days}$$

Substituting this in any of the equation (i) or (ii) we can find the daily wage of 1 man.

Thus, solving equ. (ii)

$$2M + 3 \times 37.5 = ₹ 262.5$$

$$\Rightarrow 2m = 262.5 - 112.5$$

$$\Rightarrow 2m = ₹ 150$$

$$\Rightarrow 1m = ₹ 75 / \text{days}$$

Now, daily wage of 7M + 6B

$$= 7 \times ₹ 75 + 6 \times ₹ 37.5$$

$$= ₹ 525 + ₹ 225.0$$

$$= ₹ 750$$

$$\text{Req. number of days} = ₹ \frac{22500}{750} = 30$$

23.1;

$$\cancel{3m} + 4b = \frac{2100}{7} = 300 \quad \text{(i)}$$

$$\cancel{11m} + 13b = \frac{8300}{8} = 1037.5 \quad \text{(i)}$$

From (i) and (ii)

$$11 \times 4b - 13 \times 3b = 11 \times 300 - 3 \times 1037.5$$

$$5b = 187.5$$

$$\therefore 1b = ₹ 37.5$$

$$\text{Again, } 3m + 4 \times 37.5 = 300$$

$$3m = 300 - 150 = 150$$

$$\therefore m = ₹ 50$$

Now, the required number of days

$$= \frac{11000}{7 \times 50 + 9 \times 37.5} = \frac{11000}{687.5} = 16$$

$$24.3; \quad 12m + 13b = \frac{4893.75}{3} = 1631.25$$

$$5m + 6b = \frac{3562.50}{5} = 712.5$$

$$\begin{aligned} \text{Now, } & 12 \times 6b - 13 \times 5b \\ & = 12 \times 712.5 - 5 \times 1631.25 \\ \text{or, } & 7b = 8550 - 8156.25 = 393.75 \\ \therefore & 1b = ₹ 56.25 \end{aligned}$$

$$\text{Again, } 5m + 6 \times 56.25 = 712.5$$

$$1m = \frac{712.5 - 337.5}{5} = 75$$

$$\therefore 1m = ₹ 75$$

Now, the required number of days

$$\frac{4500}{3 \times 75 + 4 \times 56.25} = \frac{4500}{450} = 10$$

$$\begin{aligned} 25.1; \quad & \left[\begin{array}{l} 5m + 5w = \frac{660}{3} = 220 \quad \text{(i)} \\ \times 2 \\ 10m + 20w = \frac{3500}{5} = 700 \quad \text{(ii)} \\ \rightarrow 10m + 10w = 220 \times 2 = 440 \quad \text{(i)} \end{array} \right] \end{aligned}$$

(Subtracting (i) from (ii))

$$10w = 700 - 440 = 260$$

$$\therefore 1w = \frac{260}{10} = ₹ 26$$

$$\text{Now, } 5m + 5w = 220$$

$$5m + 5 \times 26 = 220$$

$$\therefore 1m = \frac{220 - 130}{5} = \frac{90}{5} = ₹ 18$$

Now, the required number of days

$$\frac{1060}{(6 \times 18 + 4 \times 26)} = \frac{1060}{212} = 5$$

$$26.2; 4m + 6b = \frac{1600}{5} = 320 \quad \text{(i)}$$

$$3m + 7b = \frac{1740}{6} = 290 \quad \text{(ii)}$$

From (i) and (ii), we get
 $(4 \times 7)b - (3 \times 6)b = 290 \times 4 - 320 \times 3$
or, $10b = 1160 - 960 = 200$

$$\therefore 1b = \frac{200}{10} = ₹ 20$$

Now, $4m + 6 \times 20 = 320$
or, $4m = 320 - 120 = 200$

$$\therefore 1m = \frac{200}{4} = ₹ 50$$

Now, the required number of days

$$= \frac{3760}{(7 \times 50 + 6 \times 20)} = \frac{3760}{470} = 8$$

$$27.1; A + B + C \xrightarrow{18 \text{ days}} ₹ 2700$$

$$A + B \xrightarrow{10 \text{ days}} ₹ 940$$

$$B + C \xrightarrow{20 \text{ days}} ₹ 1520$$

Now,

$$A + B + C \xrightarrow{1 \text{ day}} ₹ 2700/18 = ₹ 150 \quad \text{(i)}$$

$$A + C \xrightarrow{1 \text{ day}} ₹ 940/10 = ₹ 94 \quad \text{(ii)}$$

$$B + C \xrightarrow{1 \text{ day}} ₹ 1520/20 = ₹ 76 \quad \text{(iii)}$$

Subtracting (ii) from (i)

$$(A + B + C) - (A + C) \rightarrow ₹ 150 - ₹ 94$$

Daily wage of B = ₹ 56

Clearly, daily wages of B + C = ₹ 76

\therefore Daily wage of C = ₹ 20

$$28.1; A + B + C \xrightarrow{10 \text{ days}} ₹ 1500$$

$$A + B \xrightarrow{8 \text{ days}} ₹ 800$$

$$B + C \xrightarrow{9 \text{ days}} ₹ 900$$

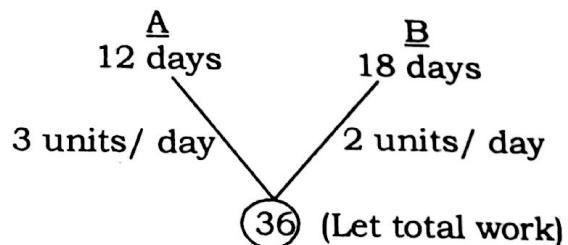
$$A + B + C \xrightarrow{1 \text{ day}} ₹ 150 \quad \text{(i)}$$

$$A + C \xrightarrow{1 \text{ day}} ₹ 100 \quad \text{(ii)}$$

$$B + C \xrightarrow{1 \text{ day}} ₹ 100 \quad \text{(iii)}$$

Subtracting (ii) from (i) we get daily wage of B = ₹ (150 - 100) = ₹ 50

29.1; Paramount concept:-



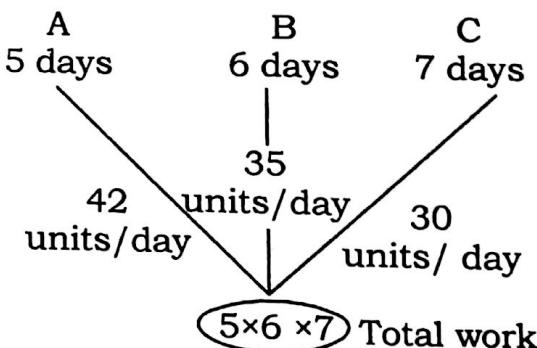
We know work and wages have direct relation.

$$\text{Thus A's share} = \frac{3}{(3+2)} \times ₹ 149.25$$

$$= \frac{3}{5} \times ₹ 149.25 \\ = ₹ 89.55$$

$$\text{B's share} = \frac{2}{5} \times ₹ 149.25 \\ = ₹ 59.70$$

30.3; Paramount concept:-



Thus,

$$\text{A's share} = \frac{42}{(42+35+30)} \times ₹ 53.50$$

$$= \frac{42}{107} \times ₹ 53.50 = ₹ 21$$

$$\text{B's share} = \frac{35}{107} \times ₹ 53.50 = ₹ 17.5$$

$$\text{C's share} = \frac{30}{107} \times ₹ 53.50 = ₹ 15$$

1. A boy and girl together fill a cistern with water. The boy pours 4 litres of water every 3 minutes and the girl pours 3 litres every 4 minutes. How much time will it take to fill 100 litres of water in the cistern?
 (1) 36 minutes (2) 42 minutes
 (3) 48 minutes (4) 44 minutes
 (5) None of these
2. 12 pumps working 6 hours a day can empty a completely filled reservoir in 15 days. How many such pumps working 9 hours a day will empty the same reservoir in 12 days?
 (1) 15 (2) 9
 (3) 10 (4) 12
 (5) None of these
3. A tap takes 36 hours extra to fill a tank due to a leakage equivalent to half of its inflow. The inlet pipe alone can fill the tank in how many hours?
 (1) 36 (2) 24
 (3) 30 (4) 18
 (5) None of these
4. Two pipes can fill a cistern in 3 hours and 4 hours respectively and a waste pipe can empty it in 2 hours. If all the three pipes are kept open, then the cistern will be filled in
 (1) 5 hours (2) 8 hours
 (3) 10 hours (4) 12 hours
 (5) None of these

5. A cistern has two pipes. One can fill it with water in 8 hours and the other can empty it in 5 hours. In how many hours will the cistern be emptied if both the pipes are opened together,
 when $\frac{3}{4}$ of the cistern is already full of water?
 (1) $13\frac{1}{3}$ hours (2) 10 hours
 (3) 6 hours (4) $3\frac{1}{3}$ hours
 (5) None of these
6. A cylindrical tank of diameter 25cm is full of water. If 11 litres of water is drawn off, the water level in the tank will drop by (Use $\pi = 22/7$)
 (1) $10\frac{1}{2}$ cm (2) $12\frac{6}{7}$ cm
 (3) 14 cm (4) $22\frac{2}{5}$ cm
 (5) None of these
7. Three taps A, B and C can fill a tank in 12, 15 and 20 hours respectively. If A is open all the time and B and C are open for one hour each alternatively, the tank will be full in
 (1) 6 hours (2) $6\frac{2}{3}$ hours
 (3) 7 hours (4) $7\frac{1}{2}$ hours
 (5) None of these

26. Pipes A and B can fill a tank in 10 hours and 15 hours respectively. Both together can fill it in
 (1) 4 hrs (2) 6 hrs
 (3) 8 hrs (4) 10 hrs
 (5) None of these

27. A tap can fill the cistern in 8 hours and another can empty it in 16 hours. If both the taps are opened simultaneously, the time (in hours) to fill the tank is
 (1) 16 hrs (2) 8 hrs
 (3) 10 hrs (4) 12 hrs
 (5) None of these

28. A pipe can fill a tank in x hours and another can empty it in y hours. In how many hours will they together fill it if $y > x$?
 (1) $\frac{xy}{y-x}$ hrs (2) $\frac{y-x}{xy}$ hrs
 (3) $\frac{2yx}{y-x}$ hrs
 (4) Can't be determined
 (5) None of these

29. A cistern can be filled by two pipes A and B in 4 hours and 6 hours respectively. When full, the tank can be emptied by a third pipe C in 8 hours. If all the taps be turned on at the same time, the cistern will be full in
 (1) $2\frac{2}{7}$ hrs (2) $3\frac{3}{7}$ hrs
 (3) $4\frac{3}{7}$ hrs (4) $2\frac{5}{7}$ hrs
 (5) None of these

30. A tank is filled by pipe A in 32 minutes and by pipe B in 36 minutes. When it is full, it can be emptied by a pipe C in 20 minutes. If all the three pipes are opened simultaneously, half of the tank will be filled in
 (1) 51 $\frac{3}{12}$ hrs (2) 53 $\frac{3}{5}$ hrs
 (3) 55 $\frac{5}{13}$ hrs (4) 56 $\frac{4}{13}$ hrs
 (5) None of these

31. If two pipes function simultaneously, the reservoir will be filled in 6 hours. One pipe fills the reservoir 5 hours faster than the other. How many hours does the faster pipe take to fill the reservoir?
 (1) 8 hrs (2) 10 hrs
 (3) 12 hrs
 (4) Can't be determined
 (5) None of these

32. Three pipes A, B and C can fill a cistern in 6 hours. After working at it together for 2 hours, C is closed and A and B can fill the remaining part in 7 hours. The time taken by C alone to fill the cistern is
 (1) 10 hrs (2) 12 hrs
 (3) 14 hrs (4) 16 hrs
 (5) None of these

33. Two taps can separately fill a cistern in 10 minutes and 15 minutes respectively and when the waste pipe is open, they can fill it in 18 minutes. The waste pipe can empty the full cistern in
 (1) 3 minutes (2) 5 minutes
 (3) 7 minutes (4) 9 minutes
 (5) None of these

34. A tank has two pipes. The first pipe can fill it in 45 minutes and the second can empty it in 1 hour. In what time will the empty tank be filled if the pipes be opened one at a time in alternate minutes?
 (1) 2 hrs 55 min (2) 3 hrs 40 min
 (3) 4 hrs 48 min (4) 5 hrs 53 min
 (5) None of these

Answers with explanations

1.3; Water filled by the boy and girl in 1 minute

$$= \frac{4}{3} + \frac{3}{4} = \frac{16+9}{12} = \frac{25}{12} \text{ litres}$$

\therefore Time taken to fill 100 litres

$$= \frac{100}{\frac{25}{12}} = 48 \text{ min.}$$

Paramount Concept:-

$4 \times (3 \text{ min.} \rightarrow 4 \text{ ltr.})$
 $3 \times (4 \text{ min.} \rightarrow 3 \text{ ltr.})$ { to make the time equal 3min. is multiplied by 4 and 4 min. is multiplied by 3

Boy \rightarrow 12 min. \rightarrow 16 ltr.

Girl \rightarrow 12 min. \rightarrow 9 ltr.

Together \rightarrow 12 min. \rightarrow 25 ltr.

$$\downarrow \times 4 \quad \downarrow \times 4$$

$$48 \text{ min.} \quad 100 \text{ l} (25 \times$$

4 is 100 l hence 12 is also multiplied by 4)

2.3; Short cut Method:-

Since the reservoirs to be filled is the same

Hence, $P_1 \times H_1 \times D_1 = P_2 \times H_2 \times D_2$
 $12 \times 6 \times 15 = P_2 \times 9 \times 12$

$$P_2 = \frac{12 \times 6 \times 15}{9 \times 12} = 10$$

3. 4; 36 extra hours when there is a leak.
Without leak it will take half the time as
the leakage is half of his inflow

$$\frac{36}{2} = 18 \text{ hrs.}$$

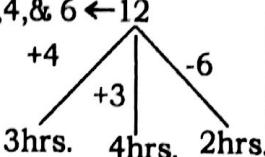
4.4; Work done by all the three pipes

$$\text{in 1 hour} = \frac{1}{3} + \frac{1}{4} - \frac{1}{2} = \frac{1}{12}$$

\therefore the cistern will be filled in 12 hrs.

Paramount Concept:-

L.C.M. of 3,4,& 6 \leftarrow 12



3 hrs., 4 hrs., and 2 hrs.
Multiplied by 4, 3 and -6 respectively gives 12.
(+4 & +3 as they are inlets and -6 as it is outlet)

$$4 + 3 - 6 = 1$$

$$\frac{12}{1} = 12 \text{ hrs.}$$

5. 2; Tank emptied in 1 hr. $= \frac{1}{5} - \frac{1}{8}$

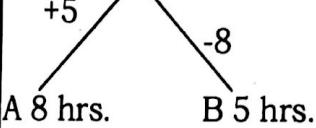
$$= \frac{8-5}{40} = \frac{3}{40} \text{ hrs.}$$

$$\text{full tank} = \frac{40}{3} \text{ hrs.}$$

$$\frac{3}{4}^{\text{th}} \text{ part of tank} = \frac{3}{4} \times \frac{40}{3} = 10 \text{ hrs.}$$

Paramount Concept:-

$40 \times \frac{3}{4}$ (tank is $3/4$ full) $= \frac{30}{3} = 10 \text{ hrs.}$



+5 as it is inlet
-8 as it is outlet
Diff. = 3 hrs.

6. 4; Volume of cylinder $= \pi r^2 h$

$$\pi r^2 \times h = 11000 \text{ cm}^3$$

$$\frac{22}{7} \times \frac{25}{2} \times \frac{25}{2} \times h = 11000 \text{ cm}^3$$

$$h = \frac{11000 \times 7 \times 2 \times 2}{22 \times 25 \times 25}$$

$$h = \frac{28 \times 4}{5} = \frac{112}{5} = 22 \frac{2}{5} \text{ cm}$$

7. 3; Part filled by A and B in 1 hour

$$= \frac{1}{12} + \frac{1}{15} = \frac{5+4}{60} = \frac{3}{20}$$

Part filled by A and C in the next 1 hour

$$= \frac{1}{12} + \frac{1}{20} = \frac{5+3}{60} = \frac{3}{15}$$

Part filled in 2 hours

$$= \frac{3}{20} + \frac{2}{15} = \frac{9+8}{60} = \frac{17}{60}$$

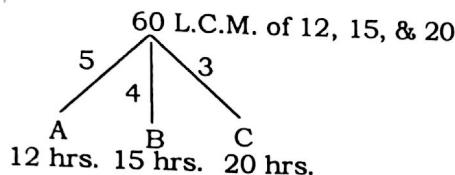
Part filled in 6 hours = $\frac{51}{60}$ (6 hrs. is obtained by multiplying 7 to any digit till it becomes just less than 60 which is the denominator)

$$\text{Remaining part} = 1 - \frac{51}{60} = \frac{9}{60} = \frac{3}{20}$$

This part will be filled by (A + B) in 1 hour

\therefore Total time taken = 7 hours.

Paramount Concept:-



$$1\text{st hr.} = (5+4) = 9 \text{ ltr. (A + B)}$$

$$2\text{nd hrs.} = (5+3) = 8 \text{ ltr. (A + C)}$$

$$2 \text{ hrs.} = (9+8) = 17 \text{ ltr.}$$

$$51 \text{ ltr.} = 6 \text{ hr.}$$

(As 17 ltr. are filled in 2 hours.)

$$\text{So, } 51 \text{ ltr. are filled in } \frac{2 \times 51}{17} = 6 \text{ hours}$$

$60 - 51 = 9$ l will be filled in the next hour i.e. 7th hour

Hence total time is $6 + 1 = 7$ hours

$$8.3; \text{ Part filled by A alone in 1 hour} = \frac{1}{36}$$

$$\text{Part filled by B alone in 1 hour} = \frac{1}{45}$$

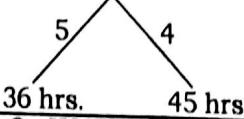
\therefore Part filled by (A + B) in 1 hour

$$= \left(\frac{1}{36} + \frac{1}{45} \right) = \frac{9}{180} = \frac{1}{20}$$

Hence, both the pipes together will fill the tank in 20 hours.

Paramount Concept:-

$180 \rightarrow \text{L.C.M. of } 36 \text{ & } 45$



$$\frac{180}{9} = 20 \text{ hrs.}$$

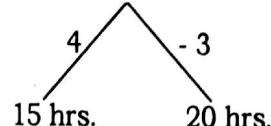
9.3; Work done by the leak in 1 hour

$$= \left(\frac{1}{15} - \frac{1}{20} \right) = \frac{1}{60}$$

\therefore the leak will empty the full tank in 60 hrs.

Paramount Concept:-

$60 \rightarrow \text{L.C.M. of } 15 \text{ & } 20$



$$\frac{60}{4-3} = 60 \text{ hrs.}$$

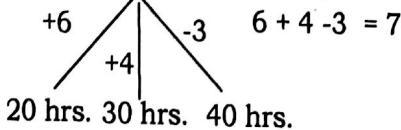
10.2; Net part filled in 1 hour

$$= \left(\frac{1}{20} + \frac{1}{30} - \frac{1}{40} \right) = \frac{7}{120}$$

\therefore The tank will be full in $\frac{120}{7}$ i.e. $17\frac{1}{7}$ hours.

Paramount Concept:-

$120 \rightarrow \text{L.C.M. } 20, 30 \text{ & } 40$



$$\frac{120}{7} = 17\frac{1}{7} \text{ hrs.}$$

11.1; According to the question $\frac{1}{50}$

$$= \frac{1}{60} + \frac{1}{75} - \frac{1}{C}$$

Work done by C in 1 min.

$$= \left(\frac{1}{60} + \frac{1}{75} - \frac{1}{50} \right) = \frac{3}{300} = \frac{1}{100}$$

\therefore C can empty the full tank in 100 minutes.