S1. Ans.(a)

Sol. Let, A's efficiency = 20

$\Rightarrow$ B's efficiency = $20 \times \frac{75}{100} = 15$

and C's efficiency = $20 \times \frac{3}{5} = 12$

	A	:	B	:	C
Efficiency Ratio =	20	:	15	:	12
Ratio of time taken alone to complte the work =	$\frac{1}{20}$	:	$\frac{1}{15}$	:	$\frac{1}{12}$
	3	:	4	:	5
	×6↓		×6↓		×6↓
	18		24		30

B and C complete the work alone in

$= \frac{24 \times 30}{24 + 30}$ days

$= \frac{40}{3}$ days $= 13\frac{1}{3}$ days

S2. Ans.(b)

Sol. Let time taken by Rohit and Sumit together to complete the work be 10x days.

So Rohit will take 16x days to complete the work alone.

Let total work = 80x units (L C M)

So, efficiency of Rohit is 5 and efficiency of Rohit and Sumit together is 8.

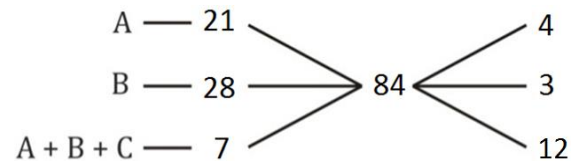Time taken by Sumit alone to finish the work $= \frac{80x}{8-5}$

$160 = \frac{80x}{3}$

x = 6

$\therefore$ Required days = 16x = 96 days

S3. Ans.(e)

Sol. Days total work efficiency

So, efficiency of C = 12 – 7 = 5 units per day

$\therefore$ Share of C = $1080 \times \frac{5}{12}$ = Rs 450

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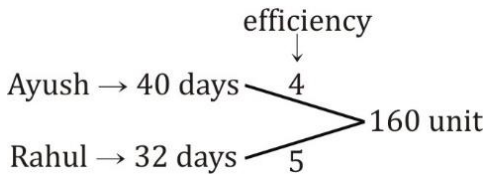
S4. Ans.(b)

Sol. Ratio of efficiency of Ayush and Rahul = 100 : 125 = 4 : 5

∴ Ratio of time taken by Ayush and Rahul = 5 : 4

∵ Ayush do the work in 40 days.

∴ Rahul do the work in 32 days.

$$
\begin{array}{l}
\text{efficiency} \\
\downarrow \\
\text{Ayush} \rightarrow 40 \text{ days} \quad 4 \\
\qquad\qquad\qquad\qquad\qquad 160 \text{ unit} \\
\text{Rahul} \rightarrow 32 \text{ days} \quad 5
\end{array}
$$

∴ work completed by Ayush in 15 days = 15 × 4 = 60 unit.

Remaining work = 160 – 60 = 100 unit

∴ Remaining work completed by Rahul in

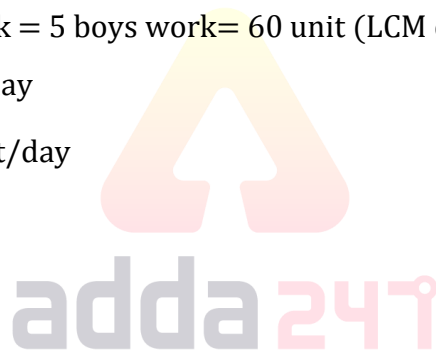$= \frac{100}{5} = 20$ days.

S5. Ans.(b)

Sol. Let 4 men work= 3 women work = 5 boys work= 60 unit (LCM of 4, 3 and 5)

Efficiency of a man $= \frac{60}{4} = 15$ unit/day

Efficiency of a woman $= \frac{60}{3} = 20$ unit/day

Required time $= \frac{60}{15+20} = \frac{60}{35}$

$= 1\frac{5}{7}$ days

S6. Ans.(d)

Sol. Let, Abhishek can complete the work alone in 'x' days.

Then, Satish can complete the work alone in $x \times \frac{100}{75}$

$= \frac{4x}{3}$ days

Bhavya can complete the work alone in $\frac{4x}{3} \times \frac{1}{2}$ days $= \frac{2x}{3}$ days

ATQ,

$\frac{3}{4x} + \frac{3}{2x} = \frac{3}{20}$

$\Rightarrow \frac{1+2}{4x} = \frac{1}{20}$

$\Rightarrow x = 15$

Bhavya and Abhishek can complete the work alone in

$\frac{15 \times 10}{15+10} = \frac{150}{25} = 6$ days.

S7. Ans.(c)

Sol. 60% work completed in $= \frac{3}{5}x$ days

100% work completed in $= \frac{3}{5} \times \frac{100}{60} = x$ days

ATQ

$$\frac{(x+28)(x+7)}{x+28+x+7} = x$$

On solving

X = 14

S8. Ans.(d)

Sol. Priya's one day work $= \frac{1}{2 \times 10} = \frac{1}{20}$

Pooja's one day work $= \frac{1}{3 \times 10} = \frac{1}{30}$

2 day work of Priya and Pooja

$$= \frac{1}{20} + \frac{1}{30} = \frac{3+2}{60} = \frac{5}{60}$$

= 12 days.

So, Pooja and Priya will take 24 days if they work alternatively.

S9. Ans.(a)

Sol. Total work = 90 units (LCM of days taken by Mohit , Hemant & B)

Efficieny of Mohit $= \frac{90}{30} = 3$ units/day

Efficiency of Hemant $= \frac{90}{18} = 5$ units/day

Efficiency of (Mohit + Hemant + B) $= \frac{90}{9} = 10$ units/day

Efficiency of person B = 10 – 3 – 5

= 2 units/day.

Required time $= \frac{90}{(2+3)}$

= 18 days.

S10. Ans.(b)

Sol. 21M × 15 = 35W × 11

9M=11W

ATQ,

18M × (Y – 4) = 20W × Y

$18 \times \frac{11}{9}W \times (Y-4) = 20W \times Y$

22Y – 88 = 20Y

2Y = 88

Y = 44.

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S11. Ans.(e)
Sol. Let A takes = x days

B takes = 3x days

$(A + B)$ together $= \frac{x \times 3x}{x+3x}$ days

C takes $= \frac{3x}{4}$ days

$(A + B + C)$ takes together = 12 days

$$\frac{\frac{x \times 3x \times \frac{3x}{4}}{x \times 3x + 3x \times \frac{3x}{4} + x \times \frac{3x}{4}}} = 12$$

$$\frac{\frac{9x^3}{4}}{\frac{12x^2 + 9x^2 + 3x^2}{4}} = 12$$

$x = \frac{24 \times 12}{9} = 32$ days

A takes = 32 days

B takes = 32 × 3 = 96 days

C takes $= \frac{3 \times 32}{4} = 24$ days

S12. Ans.(c)
Sol. Let efficiency of A and B is a and b respectively

Then

$\frac{a \times 20}{b \times 15} = \frac{5}{4}$

$\frac{a}{b} = \frac{5}{4} \times \frac{15}{20} = \frac{15}{16}$

S13. Ans.(c)
Sol. Let efficiency of a man = 2a unit/day

So a women = a unit/day

Now,

18 (18 × 2a + 12a) = Total work

Time taken by 8 man $= \frac{18(36a + 12a)}{8 \times 2a} = 54$ days

S14. Ans.(d)
Sol. Let total 'x' days required to complete the work

Given, Veer work for 12 days, Shivam work for $(x - \frac{114}{5})$ days, while

Anurag work for x days

ATQ −

$\frac{12}{80} + \frac{(5x-114)}{500} + \frac{x}{120} = 1$

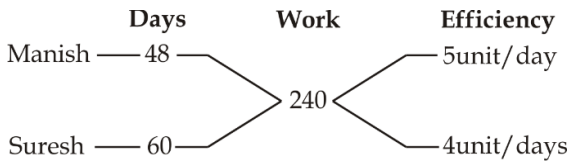$\frac{900 + 60x - 1368 + 50x}{6000} = 1$

110x = 6468

$x = 58\frac{4}{5}$ days

So, Anurag work for $58\frac{4}{5}$ days to complete the work.

S15. Ans.(a)
Sol. Task A

	Days	Work	Efficiency
Manish	48		5 unit/day
		240	
Suresh	60		4 unit/days

ATQ,

Task B

One day work of Manish and Suresh = 5 + 4 = 9 units

Total work = 9x

Manish alone can do task B in (x + 16) days

So total work = 9x = 5(x + 16)

x = 20 days

Total work = 9 × 20 = 180 unit

Suresh alone can do the work = $\frac{180}{4}$ = 45 days

S16. Ans.(c)
Sol. daily wage of a woman = $\frac{1250}{10 \times 5}$ = 25 Rs

Daily wage of a man = Rs 50

Daily wage of all men = $\frac{1600}{8}$ = 200 Rs

Total no. of man = $\frac{200}{50}$ = 4

S17. Ans.(b)
Sol. $12M + 13B = \frac{4893.75}{3}$

$12M + 13B = 1631.25$ … (i)

$5M + 6B = \frac{3562.5}{5}$

$5M + 6B = 712.5$ … (ii)

$60M + 65B = 8156.25$

$\underline{60M + 72B = 8550.0}$

$\quad\quad\quad 7B = 393.75$

$\quad\quad\quad\quad B = 56.25$

$5M = 712.5 – 337.50$

$M = 75$

One day wage of 3M and 4B = 3 × 75 + 4 × 56.25 = 450

Rs. 3150 can be earned in = $\frac{3150}{450}$ = 7 days

S18. Ans.(c)
Sol. Ratio of work done by 20 men, 30 women and 36 children

= 20 × 3 : 30 × 2 : 1 × 36

= 5 : 5 : 3

Wage of 20 men $= \frac{5}{13} \times 780 = 300$

Wage of 1 man $= \frac{300}{20} = 15$
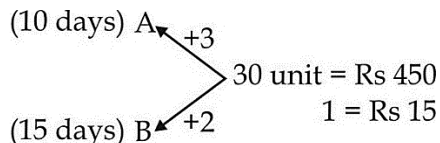
Similarly, wage of 1 woman $= 10$

And wage of 1 child $= 5$

Total wages of 15 men, 21 women and 30 children for 2 weeks

$= 2 \times (15 \times 15 + 21 \times 10 + 30 \times 5) = 2(225 + 210 + 150) = 2 \times 585 = 1170$ Rs.

S19. Ans.(a)

Sol.

(10 days) A $\searrow$ +3

$\qquad\qquad\qquad$ 30 unit = Rs 450

(15 days) B $\nearrow$ +2 $\qquad\qquad$ 1 = Rs 15

$5(A + B) \rightarrow 5 \times 5 = 25$ unit

$C \rightarrow 30 - 25 = 5$ unit

$A \xrightarrow{\text{work}} 3 \times 5 = 15$ unit $= 15 \times 15 =$ Rs. 225

$B \xrightarrow{\text{work}} 2 \times 5 = 10$ unit $= 15 \times 10 =$ Rs. 150

$C \xrightarrow{\text{work}} 5$ unit $= 5 \times 15 =$ Rs. 75

S20. Ans.(c)

Sol. We know work efficiency ratio of A to B $= 5 : 4$

Let time taken by A alone to complete the work $= 4x$

And by B to complete the work alone $= 5x$

Atq,

$5x - 4x = 6$

$\Rightarrow x = 6$

So, A alone can complete the work in 24 day

And, B alone can complete the work in 30 day

A and B working together can complete the work in

$= \frac{1}{\frac{1}{30}+\frac{1}{24}} = \frac{120}{9} = 13\frac{1}{3}$ days

S21. Ans.(b)

Sol. Let efficiency of B be '10x units /day'

So, efficiency of C $= 10x \times \frac{60}{100} = 6x$ units/day

Now,

Total work $= 22.5 (10x + 6x)$

$= 360x$ units

Now, work completed by A and B together in 1 day $= \frac{360x}{24} = 15x$ units

So, efficiency of A $= 15x - 10x = 5x$ units/day

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Now,

Work completed by A, B, C and D together in 1 day $= \frac{360x}{10} = 36x$ units

So, efficiency of D $= 36x - (10x + 6x + 5x) = 15x$ units/day

Hence, required days $= \frac{360x}{(5x + 6x + 15x)} = \frac{180}{13}$ days $= 13\frac{11}{13}$ days

S22. Ans.(a)
Sol. let efficiency of Hemant, Manoj and Vikash are A, B and C respectively.

ATQ

$\frac{(A+B)32}{3} = \frac{(B+C)96}{7}$

$7A + 7B = 9B + 9C$

$7A - 9C = 2B$ .... (I)

And

$2A + 3C = 8B$ .... (II)

Appling (I) + 3×(II)

$13A = 26B$

$\frac{A}{B} = \frac{2}{1}$

Let A and B are 2x and x

Then $C = \frac{4x}{3}$

Total work $= \frac{32}{3} \times (3x) = 32x$ unit

Required time $= \frac{32x}{x+2x+\frac{4x}{3}}$

$= \frac{32x \times 3}{13x} = 7\frac{5}{13}$ days

S23. Ans.(c)
Sol. Time taken by Pipe B to fill the tank $\frac{60}{1.5} = 40$ hours

Time taken by C to complete the work $= 30$ hours

Let the total capacity of the tank be 120 units (LCM)

So, the efficiency of A, B and C are 2 units/hr, 3 units/hr and 4 units/hr respectively.

ATQ

$(2 + 4) \times X + 3 \times (X + 13) = 120$

$X = 9$

S24. Ans.(a)
Sol. Let efficiency of A be '4x units /day'

So efficiency of B $= 4x \times \frac{150}{100} = 6x$ units/day

And efficiency of C $= 4x \times \frac{75}{100} = 3x$ units/day

ATQ,

Total work $= (6x + 3x) \times 24 = 216$ x units

Now,

A's increased efficiency $= 4x \times \frac{150}{100} = 6x$ units/day

B's increased efficiency $= 6x \times \frac{150}{100} = 9x$ units/days

So, required days $= \frac{216\,x}{(6x + 9x + 3x)} = \frac{216x}{18x} = 12$ days

S25. Ans.(d)
Sol. Let efficiency of Veer and Shivam be '5x units/day' and '6x units/day' respectively.

ATQ,

Total work = 25 × 6x = 150x units

Now,

Work done by Veer in 18 days = 5x × 18 = 90x units

Remaining work = 150x – 90x = 60x units

So, required days = $\frac{60x}{6x}$ = 10 days

S26. Ans.(d)
Sol. (T+ 4) type 'A' types of pipes can fill a tank in 2T hours

So, 1 type 'A' pipe can fill the tank in 2T (T + 4) hours

Same, (T +12) type 'B' types of pipes can fill the tank in (T + 8) hours

So, 1 B' types of pipes can fill the tank in (T + 8) (T + 12) hours

Also given, ratio of efficiency of type 'A' to type 'B' pipe is 5 : 4

So, ratio of time taken by type 'A' to type 'B' pipe be 4 : 5

ATQ –

$\frac{4}{5} = \frac{2T\ (T+4)}{(T+8)(T+12)}$

2 (T² + 20T + 96) = 5T (T + 4)

2T² + 40T + 192 = 5T² + 20T

3T² −20T − 192 = 0

T = 12 , $-\frac{16}{3}$

12 type 'A' pipes can fill the tank in = $\frac{16×24}{12}$ = 32 hours

And, 15 type 'B' pipes can fill the tank in = $\frac{24×20}{15}$ = 32 hours

Required time = $\frac{32×32}{32+32}$ = 16 hours

S27. Ans.(a)
Sol. Veer can complete the whole task alone = 16 × 4 = 64 days

Sameer can complete the same task alone = 16 × 3 = 48 days

Total work = 192 units(LCM of 64 and 48)

Efficiency of Satish = $\frac{192}{16} - \frac{192}{48}$ = 8 units/day

If all three work alternatively

First day by Satish = 8 units

Second day by Sameer = 4 units

Third day by Veer = 3 units

Total work in three days = 8 + 4 + 3 = 15 units

In total 36 days = $\frac{36}{3}$ × 15 = 180 units

Satish on 37 days = 8 units

Remaining work after 37 days = 192 – 180 – 8 = 4 units

On 38 days remaining work by Sameer = $\frac{4}{4}$ = 1days

Total time = 38 days

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S28. Ans.(b)

Sol. Let efficiency of B = 100

So, efficiency of A = 120

And efficiency of C = $100 \times \frac{80}{100} = 80$

Efficiency of D = $\frac{100+120+80}{2} = 150$

Ratio of efficiency of A, B, C and D = 6 : 5 : 4 : 7.5

Let one day work of A , B , C & D be 6x units, 5x units, 4x units & 7.5x units respectively

ATQ –

Total work = $7.5x \times 8 + (5x + 6x + 4x) \times 12$

= 240x units

When B & D work alternatively

First day by D = 7.5x units

Second day be B = 5x units

Two day work of = 7.5x + 5x = 12.5x units

In 38 days total work = $\frac{38}{2} \times 12.5x = 237.5x$ units

Remaining work = 240x – 237.5x = 2.5x

Remaining work by D on 39 days = $\frac{2.5x}{7.5x} = \frac{1}{3}$ days

Total time = $38\frac{1}{3}$ days

S29. Ans.(e)

Sol. Time taken by Pipe A to fill tank 1 = 7.5 min.

Time taken by pipe B to fill tank 1 = $\frac{25}{2}$ min = 12.5 min

Let the total volume of tank 1 is 75 x

The efficiency of pipe A = $\frac{75x}{7.5} = 10$ x/min

Efficiency of pipe B = $\frac{75x}{12.5} = 6x$ /min.

When pipe A is opened for 12 minutes, Amount of water = $10x \times 12 = 120$ x

Similarly

Amount of water by pipe B = $6x \times 12 = 72x$.

ATQ,

$\frac{\text{Volume (Tank2)}}{\text{Volume (Tank1)}} = \frac{4}{1}$

Volume (Tank 2) = $4 \times 75x = 300x$

Amount of water filled by pipe C = 300 x- 192 x = 108 x.

Time take by C was 18 minutes

Efficiency of C = $\frac{108x}{18} = 6x/min$

Time taken by pipe C to fill 80% of tank 1 = $\frac{80}{100} \times \frac{75x}{6x}$ = 10 minutes.

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S30. Ans.(e)
Sol.

	Days	Total work	efficiency
A —	18		4 unit/daily
B —	24	72	3 unit/daily
C —	36		(–2) unit/daily

ATQ—

$(A + B)x + (A + B - C)\left(\frac{5x+24}{5}\right) = 72$

$7x + 5\left(\frac{5x+24}{5}\right) = 72$

$12x = 48$

$x = 4$

$(A + B + C)$ work for

$= 4 + 4\frac{4}{5}$

$= 8\frac{4}{5}$ days

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