Time and Work

Solution

1. Answer: (B)

Let Raj and Rahul can do 3x and 4x unit of work in one day.
So,
Total work = (3x + 4x) × 8 = 56x
(Raj + Rahul) two day work = 7x × 2 = 14x
Remaining work = 42x
In 6 days Rahul will complete
= 6 × 4x = 24x units
So, remaining 18x units are completed by Satish in 6 day
So,
56x unit will be completed in
$= \frac{56x}{\frac{18x}{6}} = \frac{56}{3} days$

2. Answer: (D)

Time taken by A in completing 1/3 of work
$= 24 \times \frac{1}{3} = 8\ days$
Time taken by B in completing ½ of work
= 8 days
B alone will complete the work = 16 days
Required time = $\frac{16 \times 24}{40} = \frac{48}{5} days$

3. Answer: (D)

B can complete work alone in = $20 \times \frac{4}{5} =$ 16 days
Let C alone can complete work in 'x' days
ATQ
$\frac{6}{16} + \frac{15}{x} = 1$
$\Rightarrow \frac{15}{x} = \frac{10}{16}$
$\Rightarrow x = \frac{15 \times 16}{10} = 24\ days$

4. Answer: (C)

Let, total work = 144 units (LCM of 36 and 48)
Efficiency of A = 144/34 = 4 units / day
B's efficiency = 144/48 = 3 units / day
Work complete by A and B in mentioned days = $\frac{1}{3} \times 144 = 48\ units$
ATQ,
$4x + 3(x + 2) = 48$
$x = 6$

5. Answer: (C)

1 day work of C = $\frac{1}{5}\left(\frac{1}{10} + \frac{1}{12}\right) = \frac{1}{60} units$
Time taken by C alone to complete the work = 60 days

6. Answer: (D)

1 day work of 1 man = $\frac{1}{7 \times 10} = \frac{1}{70} units$
1 day work of 1 man = $\frac{1}{10 \times 10} = \frac{1}{100} units$

	Time (days)	Work (units)	Efficiency (units/day)
1 Man	70	700	10
1 Woman	100		7

I day work required to complete work in 4 days = $\frac{700}{4} = 175\ units$
1 day work of 15 woman = 15 × 7 = 105 units
Required no. of man = $\frac{175-105}{10} = 7$

7. Answer: (D)

A and B can do a work = 12 days
B and C can do the same work = 15 days
C and A can do the same work = 20 days
Work done by A and B in one day = 1/12, i.e. (A + B) = 1/12 – – – – (1),
Work done by B and C in one day = 1/15, i.e. (B + C) = 1/15 – – – – (2),
Work done by C and A in one day = 1/20, i.e. (C + A) = 1/20 – – – – (3),
Solving equations (1), (2) and (3), we get,
B = 1/20, C = 1/60, A = 1/30,
Work done by A, B and C together = 120 + 130 + 160 = 110,120 + 130 + 160 = 110,
Hence, total time required to complete the work by A, B and C = 10 days.
Total work = LCM (12, 15 and 20) = 60

Person	Time	Total work	Efficiency
A + B	12	60	5

B + C	15	60	4
C + A	20	60	3

Total efficiency = 2(A + B + C) = 12
⇒ A + B + C = 6
Time taken by A, B, and C together to finish the work = 60/6 = 10 days
∴ Time taken by A, B, and C together to finish the work is 10 days

8. Answer: (B)
A is 40% more efficient than B
Total time is taken by A and B to complete the work together = $9\frac{3}{8}$ days
A works for first five days alone and the remaining work completed by B
Let the efficiency of B be 100
So, Efficiency of A = 100 × 140/100 = 140
Ratio of A and B's efficiency = 140 ∶ 100 = 7 ∶ 5
Total Efficiency of A and B = 7 + 5 = 12
Work done by A and B together in $9\frac{3}{8}$ days = 12 × 75/8 = 225/2
Work done by A in first five days = 7 × 5 = 35
Remaining Work = (225/2) – 35 = 155/2
Time taken by B to complete the remaining work = (155/2) ÷ 5
⇒ 31/2
Total time taken by A and B to finish the work = 5 + 31/2
⇒ 41/2 = $20\frac{1}{2}$ days
∴ Total time taken by A and B is $20\frac{1}{2}$ days

9. Answer: (C)
A can complete the work in 24 days
⇒ A's 1 – day work = 1/24
B can complete the work in 36 days
⇒ B's 1 – day work = 1/36
C can complete the work in 18 days
⇒ C's 1 – day work = 1/18
B left the job after working for 5 days and C left the job 2 days before completion
Let the work be completed in x days and complete work is done (1 unit)
⇒ (5/36) + (x – 2)/18 + x/24 = 1
⇒ (10 + 4x – 8 + 3x)/72 = 1
⇒ 7x + 2 = 72
⇒ x = 10
∴ Work is completed in 10 days

10. Answer: (B)
In 6 days part of the work done by
A = $\frac{6}{8} = \frac{3}{4}$
During 2 days, part of the work destroyed by B = $\frac{2}{3}$
Work done = $\frac{3}{4} - \frac{2}{3} = \frac{9-8}{12} = \frac{1}{12}$
Remaining work = $1 - \frac{1}{12} = \frac{11}{12}$
∴ Required no of days = $\frac{11}{12} \times 8$
= $7\frac{1}{3}$ days.

11. Answer: (A)
Efficiency of A : B = 1 : 4 = 2 : 8
Efficiency of B : C = 2 : 1 = 8 : 4
Efficiency of A : B : C = 2 : 8 : 4
Since (B + C) → 8 days
∴ total unit = 8 × (8 + 4) = 96 unit
∴ time taken by A = $\frac{96}{2} = 48\ days$.

12. Answer: (B)
Let, C takes x days to complete the work alone.
Then, B takes $\frac{x}{3}$ days to complete the work alone.
$\frac{1}{x} + \frac{3}{x} = \frac{1}{12}$
Or, x = 48 days
Suppose A and B take 'y' days to complete the work together
Then, A takes 2y days to complete the work alone.
$\frac{1}{2y} + \frac{1}{16} = \frac{1}{y}$
Or, $\frac{1}{2y} = \frac{1}{16}$
or, 2y = 16
Hence, A will take 16 days.

13. Answer: (B)
Let time taken C to complete the work alone = x days

Then time taken by B to complete the work alone = $\frac{x}{3} days$

$\frac{1}{\frac{1}{x}+\frac{1}{\frac{x}{3}}} = 15$

⇒ x = 60

⇒ time taken by B alone to complete the work

= 20 days.

Again let A take y days to complete the work alone, the $\frac{3}{y} = \frac{1}{y} + \frac{1}{20}$

or , y = 40 days

14. Answer: (C)

Efficiency ratio A and B = 5 : 6

And time ratio of A and B = 6 : 5

i.e. in 1 day A and B together do 6 + 5

= 11 units work

Now,

$\frac{Work\ done\ by\ B}{Work\ done\ by\ A} = \frac{6 \times x}{5x(x+8)} = \frac{2}{3}$

⇒ x = 10

∴ B does 10 × 6 = 60 units work

A does (10 + 8) × 5 = 90 units work

So, total work i.e. 60 + 90 = 150 units will be completed by A and B together in

$\frac{150}{11} i.e. 13\frac{7}{11} days$

15. Answer: (E)

Let, total work = 60 Unit (LCM of 15, 20 & 30)

Efficiency of A = 60/15 = 4 unit/day

Efficiency of B = 60/20 = 3 unit/day

Efficiency of C = 60/30 = 2 unit/day

Let C work for 'x' days

So,

$4 \times 2 + 3(x-6) + 2 \times x = 60$

$x = 14$

16. Answer: (C)

A do half of work in = $\frac{36}{2} = 18\ days$

B can do whole work in = 18 × 3 = 54 days

Let total work = 108

C efficiency = (2 + 2) w/d = 4 w/d

(A + B + C) together = $\frac{108}{(3+2+4)}$

= $\frac{108}{9}$ = 12 days

17. Answer: (B)

1 day work of C & D = 1/20 + 1/30 = 1/12

C and D together complete in $= 12\ days$

So, A and B together complete in 12 days.

Let A can complete that work in x days.

Then, B can complete that work = 2x days

Total work = 2x (LCM of x & 2x)

Now, According to question,

$\frac{2x}{3} = 12$

So, x = 18

So, A can complete alone in 18 days.

18. Answer: (B)

A's efficiency = 5

B's efficiency = 4

Let total work = 60

Quantity I. A can do $\frac{5}{6}$ of work in $\rightarrow \frac{50}{5} = 10\ d$

Quantity II:B can do $\frac{4}{5}$ of work in $\rightarrow \frac{48}{4} = 12d$

Quantity II > Quantity I

19. Answer: (A)

First we will find Quantity A,

Quantity A:

No. of hours taken to complete a home work = 2 hrs

Total no. of hours he worked = 6 hrs

∴ No.of homeworks he can complete = (Total no. of hours worked)/(No. of hours taken to complete each home work) = 6/2 = 3 home – works

Now,

Quantity B:

Work done by A in 1 day = 1/20

Work done by B in 1 day = 1/25

Work done by C in 1 day = 1/10

Work done by A & B together in 9 days = $9 \times \left(\frac{1}{20} + \frac{1}{25}\right) = \frac{81}{100}$

Amount of work remaining $= 1 - \frac{81}{100} = \frac{19}{100}$

Work to be done by A, B & C in 'x' days = 19/100

$\Rightarrow x \times \left(\frac{1}{20} + \frac{1}{25} + \frac{1}{10}\right) = \frac{19}{100}$

⇒ x = 1 day

⇒ No. of days in which the remaining work gets completed = 1

∴ Quantity A > Quantity B

20. Answer: (D)

The correct answer is option 4 i.e. Rs. 10000

Given:

A alone and complete the work in 20 days and can complete it in 12 days with the help of B.

So, 1/20 + 1/B = 1/12

1/B = 1/12 – 1/20

1/B = 2/60 B = 30

Hence,

B can complete the work alone on 30 days.

Since,

efficiency in Inversely proportional to time.

Ratio of efficiencies of A and B = 30 : 20

And A got Rs 15000 for doing the work

Hence,

Amount received by B

= 15000 × 20/30

= Rs. 10000