TIME AND WORK

TIME AND WORK

1) Total work = Efficiency × Days / LCM of given days

2) $\text{Efficiency} = \frac{\text{Total work}}{\text{Days}}$

3) $\text{Days} = \frac{\text{Total work}}{\text{Efficiency}}$

T&W 01 : A & B can do a piece of work alone in 3 and 6 days. In how many days they complete the work, if they work together ?

(a) 3
(b) 5
(c) 4
(d) 6
(e) 2

$(A+B)$ Days $\Rightarrow \dfrac{\text{Total work}}{(A+B)\text{ Efficiency}}$

LCM $\{3, 6\} = (6)$

$\Rightarrow \dfrac{6}{2+1} = \dfrac{6}{3} =$ (2 days)

$A's$ Efficiency $= \dfrac{\text{TW}}{A's \text{ Days}}$

$A's$ 1 day work $\Rightarrow \dfrac{6}{3} \Rightarrow (2)$

$B's$ efficiency $= \dfrac{\text{TW}}{B's \text{ Days}}$

$\Rightarrow \dfrac{6}{6} = (1)$

$\dfrac{A \times B}{A+B}$

$\dfrac{3 \times 6}{3+6}$

$\dfrac{3 \times 6}{9}$ (2)

T&W 05 : A & B together can do a piece of work in 6 days. If A alone finished the work in 12 days, then how many days that B takes to finished the work?

(a) 4 days
(b) 6 days
(c) 10days
(d) 12 days
(e) None of these

$A + B = 6$

$A = 12$

B_s' Days $= \frac{T.W}{B_s' \text{ Effi}}$ → lcm $\{6, 12\} = 12$

$(A+B)$ Effic. $= \frac{T.W}{(A+B)\text{Days}} = \frac{12}{6} = 2$ ✓

A_s' Effi $= \frac{T.W}{A_s' \text{ Days}} = \frac{12}{12} = 1$ ✓

(B) ⇒ $\frac{12}{1}$ = 12 days

$\frac{A \times B}{A \sim B} = \frac{6 \times 12}{12 \sim 6} = \frac{6 \times 12}{6}$ =

100%

ENG 10:04 AM

T&W 06 : A can do a work in 15 days and B in 20 days. If they work on it together for 4 days, then the fraction of the work that is left is?

(a) ~~1/10~~
(b) 1/4
(c) 7/15
(d) ~~8/15~~
(e) none of these

(4) A = 15
(3) B = 20
60 → TW

Work completed = (A + B) × 4

⇒ (4 + 3) × 4

⇒ 28

nof completed

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

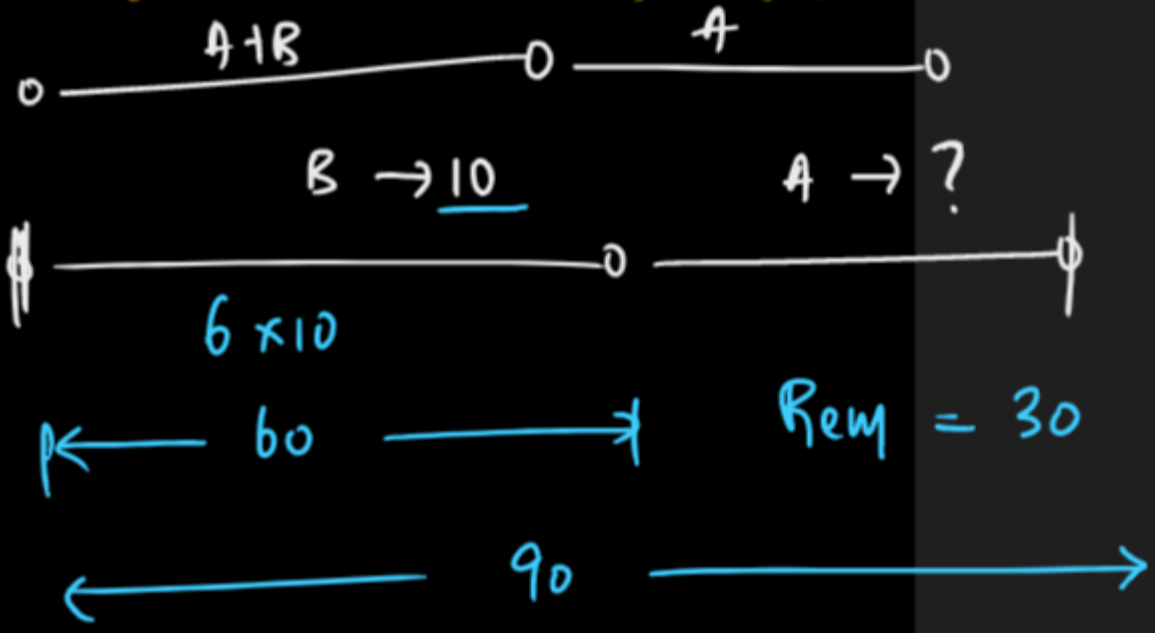
Part of / fraction of work completed

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

T&W 07 : A can finish a work in 18 days and B can do the same work in 15 days. B worked for 10 days and left the job. In how many days, A alone can finish the remaining work?

(a) 8
(b) 5
(c) 6
(d) 5 1/2
(e) None of these

(5) = 90/18 A = 18
(6) = 90/15 B = 15
(90)



$$A's\ Days = \frac{Rem\ T.W}{A's\ Effic}$$

$$= \frac{30}{5} = 6\ days$$

T&W 08 : A can do a piece of work in 10 days, while B can do the same work in 15 days ,then their efficiency ratio?

(a) 3 : 2
(b) 2 : 1
(c) 1 : 3
(d) 2 : 3
(e) 3 : 1

A = 10
B = 15

LCM (10, 15) = 30

A = 3
B = 2

A's eff : B's eff

$\frac{30}{10} : \frac{30}{15}$

3 : 2

Days $\propto \frac{1}{\text{Efficiency}}$

$\frac{1}{10} : \frac{1}{15}$

$\frac{1}{10_2} : \frac{1}{15_3}$

3 : 2

T&W 09 : A is twice efficient as B. A and B together can finish the work in 5 days. Then work will be finished by B alone in how many days?

(a) 10
(b) 15
(c) 20
(d) 25
(e) None of these

Effic A : B
2 : 1

A+B = 5 days

$$B' \text{ Days} = \frac{T.W}{B's \text{ eff}}$$

$$= \frac{3 \times 5}{1} = 15 \text{ days}$$

Total work = Efficiency × Days

(2+1) × 5

A days $= \frac{72 \times 2}{3}$

T&W 10 : A and B can do a piece of work in 18 days, B and C in 24 days, A and C in 36 days. In what time can they do it all working together.

1) 12 days 2) 13 days 3)16 days 4) 26 days 5) 15 days

$\frac{72}{18}$ $A+B = 18$

$\frac{72}{24}$ $B+C = 24$

$\frac{72}{36}$ $A+C = 36$

T2

$A+B+C = ?$

$A+B = 9 \longrightarrow (1)$

$B+C = 3 \longrightarrow (2)$

$A+C = 2 \longrightarrow (3)$

$2(A+B+C) = (9+3+2)$

$A+B+C = \frac{9}{2} = 4.5$

$\frac{A+B+C}{3} = 4.5$

$A = 4.5 - 3$

$A = 1.5$

$\text{Days} = \frac{\text{T.W}}{\text{EH}}$

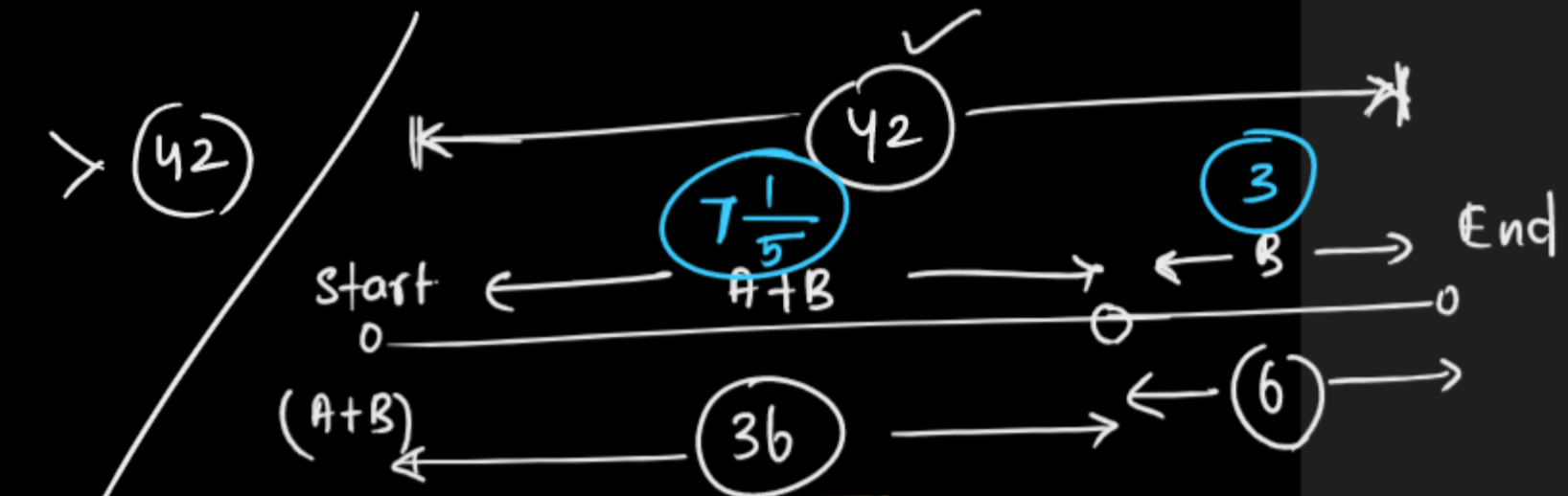
$\Rightarrow \frac{8 \times 72 \times 2}{9}$

$\Rightarrow 16$

T&W 11 : A can do a piece of work in 14 days which B can do in 21 days. They began together but 3 days before the completion of the work, A leaves off. The total number of days to complete the work?

A) 6 3/5 DAYS
B) 8 ½ DAYS
C) 10 1/5 DAYS
D) 13 ½ DAYS
E) 10 ½ DAYS

42 — A — 14 → 14
42 — B — 21 → 21
> 42



$7\frac{1}{5} + 3 = 10\frac{1}{5}$ days

$\frac{36}{5} = 7\frac{1}{5}$ days

T&W 15 : A can do a certain job in 12 days. B is 60% more efficient than A. The number of days it take B to do the same piece of work in

$A = 12$ days

effic

B : A

160 : 100

8 : 5

$$B \text{ days} = \frac{T.W}{B's \text{ eff}} = \frac{A \text{ Eff} \times A \text{ days}}{8} = \frac{5 \times 12}{8}$$

fns $\Rightarrow \frac{\overset{3}{\cancel{5} \times \cancel{12}}}{\underset{2}{\cancel{8}}} = \frac{15}{2} = 7\frac{1}{2}$ days

T&W 16 : A is 50% as efficient as B. C does half of the work done by A and B together. If C alone does the work in 20days, then A, B and C can do the work in?

	A	B	C = (A+B)/2
effici	50	100	C
	1 :	2	3/2

$$A : B : C$$

$$1 : 2 : \frac{3}{2}$$

$$(A+B+C)\ \text{days} = \frac{\text{T.W}}{\text{Eff}}$$

$$\Rightarrow \frac{3 \times 20}{\cancel{9}\ 3} = 6\frac{2}{3}\ \text{days}$$

$$A : B : C$$

$$2 : 4 : 3$$

20 days

T&W 19 : A and B can complete a piece of work in 12 and 18 days respectively. A begins to do the work and they work alternatively one at a time for one day each. The whole work will be completed in ?

(3) A = 12
(2) B = 18 > (36)

A	B	A	B	A	B
1st	2nd	3rd	4th	5th	6th
3	2	3	2	3	2
					15

(A+B) 2 day → 3+2

(A+B) 2 day (×7) → 5 (×7)

(A+B) 14 day → 35

15th (A) ⇒ $\frac{1}{3}$

Ans : $14\frac{1}{3}$ days

(5) A = 12
(4) B = 15
> (60)

Start A

$a \xrightarrow{\times 6} q \xrightarrow{\times 6}$

12 → 54

13th (A) → 59

14th (B) → 1/4

Start with A

$12\frac{1}{4}$ days

Start B

12 → 54

13th (B) → 58

14th (A) → 2/5

$13\frac{2}{5}$ days

T&W 18 : A can do a piece of work in 6 days and B alone can do it in 8 days. A and B undertook to do it for Rs.320 with the help of C, they finished it in 3 days. How much is paid to C.

1) Rs.30 2) Rs.40 3) Rs.60 4) Rs.80 5) Rs. 45

Wages

(4) A = 6

(3) B = 8

(24)

(8) A+B+C = 3

A	B	C
4	3	(1)

← Efficiency

A's share $= \frac{1}{8} \times 320$

$= 40 \cdot Rs$

T&W 20 : A certain number of men can complete a job in 30 days. If there were 5 men more, it could be completed in 10 days less. How many men were in the beginning?

(1) 10 (2) 15 (3) 20 (4) 25

$$\frac{M_1 \times D_1 \times T_1 \times E_1}{W_1} = \frac{M_2 \times D_2 \times T_2 \times E_2}{W_2}$$

$$x \times 30 = (x+5)(20)$$

$$30x = 20x + 100$$

$$10x = 100$$

$$x = 10$$

$T.W = M \times D$

T&W 21 : 5 men and 12 boys finish a piece of work in 4 days, 7 men and 6 boys do it in 5 days. The Ratio between the efficiencies of a man and boy is?

A. 1:2 B. 2:1 C. 2:3 **D. 6:5**

$(5M + 12B) \times 4 = \text{Total work}$

$(7M + 6B) \times 5 = \text{Total work}$

$(5M + 12B) \times 4 = 5 \times (7M + 6B)$

$20 \quad 48 \quad 35 \quad 30$

$18B = 15M$

$\frac{B}{M} = \frac{15}{18} = \frac{5}{6}$

T&W 22 : 9 men and 12 boys finish a job in 12 days, 12 men and 12 boys finish it in 10 days. 10 men and10 boys shall finish it in how many days?

A. 8 B. 10 C. 12 D. 14

$$(9M + 12B) \times 12 = (12M + 12B) \times 10$$

$$72 \qquad 6 \qquad 60 \qquad 5$$

$$54 \qquad\qquad 60$$

$$(9M + 12B) \times 12 = TW \quad 12B = 6M$$

$$(M + 12B) \times 10 = TW \quad \frac{B}{M} = \frac{6}{12}$$

$$\frac{B}{M} \rightarrow \frac{1}{2}$$

$$(10M + 10B) \times ? = (9M + 12B) \times 12$$

$$(2)\ (1) \qquad\qquad (2)\ (1)$$

$$20 + 10 \qquad\qquad 18 \quad 12$$

$$30 \times ? = 30 \times 12$$

$$? = 12 \text{ days}$$

T&W 23 : 3 men or 6 women can do a piece of work in 20 days. In how many days will 12 men and 8 women do the same work?

A. 7/2 B. 15/4 C. 5 D. 4

$3m \times 20 = 6w \times 20$

$\frac{m}{w} = \frac{6}{3}$

$\boxed{\frac{m}{w} = \frac{2}{1}}$

$(\overset{(2)}{12m} + \overset{(1)}{8w}) \times ? = 3m^{(2)} \times 20$

$\underset{24}{} \quad \underset{8}{}$

$32 \times ? = 120$

$? = \frac{120}{32} = \frac{30}{8} = \frac{15}{4}$

$\boxed{= 3\frac{3}{4} \text{ days}}$

T&W 25 : A company employed 200 workers to complete a certain work in 150 days. If only one-fourth of the work has been done in 50 days, then in order to complete the whole work in time, the number of additional workers to be employed was

(1) 100 (2) 300 (3) 600 (4) 200

$$\frac{M_1 \times D_1 \times H_1 \times E_1}{W_1} = \frac{M_2 \times D_2 \times H_2 \times E_2}{W_2}$$

$$\frac{200 \times 50}{\frac{1}{4} \times \text{work}} = \frac{m \times 100}{\frac{3}{4} \times \text{work}}$$

$$\frac{200 \times 50}{1} = \frac{m \times 100}{3}$$

$$m = 300$$

T&W 25 : A company employed 200 workers to complete a certain work in 150 days. If only one-fourth of the work has been done in 50 days, then in order to complete the whole work in time, the number of additional workers to be employed was

(1) 100 (2) 300 (3) 600 (4) 200

$$\frac{M_1 \times D_1 \times H_1 \times E_1}{W_1} = \frac{M_2 \times D_2 \times H_2 \times E_2}{W_2}$$

$$\frac{200 \times 50}{\frac{1}{4}} = \frac{200 \times D}{\frac{3}{4}}$$

$$150 = D$$

Q. 28

$A \times \frac{1}{4} = 4$

$A \times (1) = 16$ days

$B \times \frac{3}{4} = 3$

$B \times 1 = \cancel{3} \times \frac{4}{\cancel{3}}$

$B \times 1 = 4$ days

Q. 29

$(A+B+C) \times \frac{3}{4} = 12$

(5) $(A+B+C) \times \frac{1}{\cancel{12}} = \frac{\cancel{4}}{\cancel{12}} \times \frac{4}{3} = 16$

$(B+C) \times \frac{2}{5} = 8$

(4) $(B+C) \times \frac{1}{\cancel{8}} = \frac{\cancel{4}}{\cancel{8}} \times \frac{5}{2} = 20$

$A \times 1 = 80$ days

A days $= \frac{T \cdot W}{Eff}$

80 $= \frac{\frac{3}{8} \times 80}{1}$

$= \frac{30}{1}$

= 30 days

Book Pg. – Q.2

A → $2\frac{3}{4}$ → $\frac{11}{4}$

B → $3\frac{2}{3}$ → $\frac{11}{3}$

$$\frac{\text{LCM of NUM}}{\text{HCF of DEN}} = \frac{11}{1} = 11$$

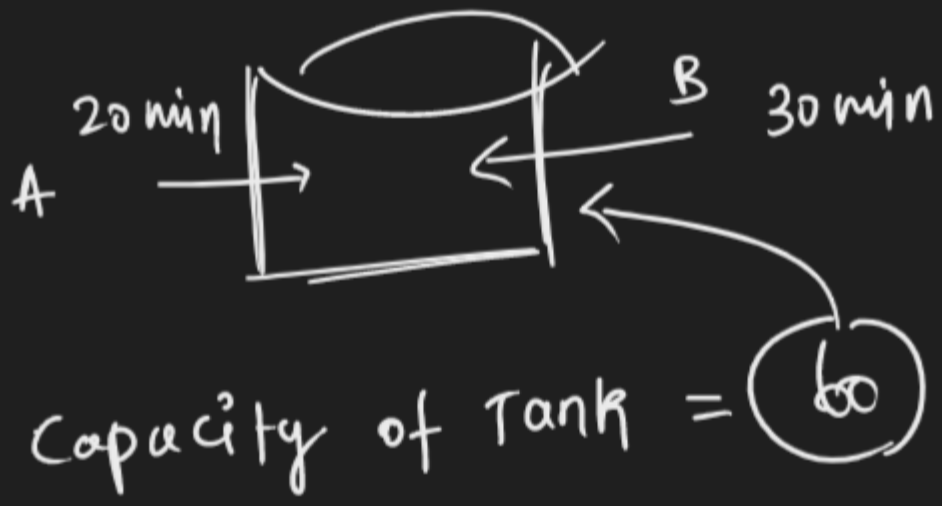
A's eff $= \frac{11}{11/4} = 4$

B's eff $= \frac{11}{11/3} = 3$

$$(A+B)\ \text{Days} = \frac{\text{T.W}}{(A+B)\ \text{eff}}$$

$$= \frac{11}{7} = 1\frac{4}{7}\ \text{days}$$

PIPES AND CISTERN



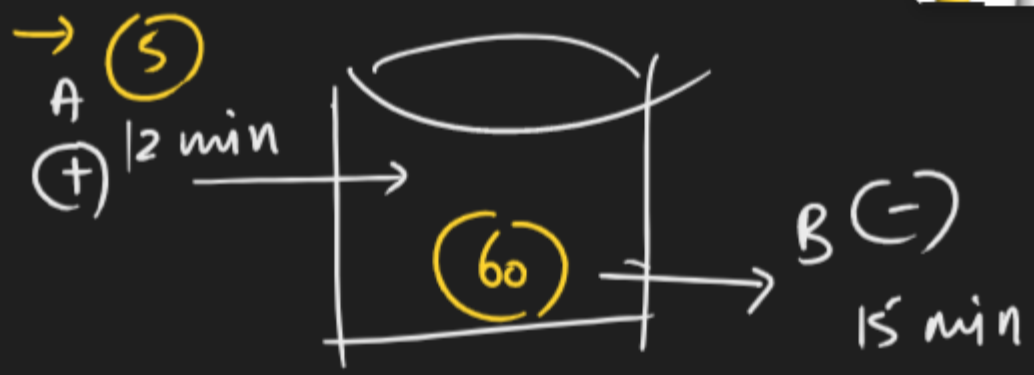
Capacity of Tank = 60

A's eff = $\frac{60}{20}$ = 3 lit/min

B's eff = $\frac{60}{30}$ = 2 lit/min

1 min ⟶ 5 lit

? ⟶ 60 lit



1 min — 1 lit

60 min — 60 lit

T&W 28 : A does half as much work as B in one sixth of the time. If together they take 10 days to complete a work, how much time shall B take to do it alone?

(1) 70 days (2) 30 days (3) 40 days ANS (4) 50 days

	Work	Time
A	$1^{\times 2}$	$1^{\times 2}$
B	2	6

Time

2 : 1 → 3

6 : 3 → 1

$$B \text{ days} = \frac{T \cdot W}{B \text{ eff}}$$

$$= \frac{(3+1) \times 10}{1}$$

$$= 40$$

3/4 → A
3/4 → B

T&W 17 : A does half as much work as B in three-forth of the time. If together they take 18 days to complete the work, how much time shall B take to do it?

1)40 days 2) 35 days 3) 25 days 4) 30 days 5) 40 days

	Work	Time	T	Ratio
A	1 x 2	3 x 2	6	3
B	2	4	4	2

Eff
2 : 3

$$= \frac{5 \times 18^{6}}{3} = 30 \text{ days}$$

100%

ENG 12:51 PM