Time and Work Ex 11.1 Q25

Answer :

Pipe A can fill the tank in 10 hours, and pipe B can fill the tank in 15 hours.

$\therefore$ In 1 hour, A can fill $\frac{1}{10}$ th part of the tank.

In 1 hour, B can fill $\frac{1}{15}$ th part of the tank.

$\therefore$ In 1 hour, A and B can fill $\left(\frac{1}{10}+\frac{1}{15}\right)$

$=\frac{3+2}{30}=\frac{5}{30}=\frac{1}{6}$ th part of the tank

$\therefore$ In 4 hours, A and B can fill $\left(\frac{1}{6}\times 4\right)=\frac{2}{3}$ rd part of the tank

Remaining part of the tank $=1-\frac{2}{3}=\frac{1}{3}$

Now, A can fill the tank in 10 hours.

$\therefore$ $\frac{1}{3}$ rd part of the tank can be filled by A in $\left(\frac{1}{3}\times 10\right)$ hours or $\frac{10}{3}$ hours or $3\frac{1}{3}$ hours.

Time and Work Ex 11.1 Q26

Answer :

When there is no leakage, the pipe can fill the cistern in 10 hours.

Thus, the pipe can fill $\frac{1}{10}$ th part of the cistern in 1 hour.

When there is leakage, the pipe can fill the cistern in 12 hours.

Therefore, in case of leakage, the pipe can fill $\frac{1}{12}$ th part of the cistern in 1 hour.

Thus, in one hour, due to leakge, $\left(\frac{1}{10}-\frac{1}{12}\right)$ th or $\frac{1}{60}$ th part of the cistern is emptied.

Hence, the cistern will be emptied by the leakage in 60 hours.

Time and Work Ex 11.1 Q27

Answer :

Time taken by tap A to fill the cistern $=12$ hours

Time taken by tap B to fill the cistern $=15$ hours

Let C be the outlet that can empty the cistern in 10 hours.

Time taken by tap C to empty the cistern $=10$ hours

Now,

Tap A fills $\frac{1}{12}$ th part of the cistern in 1 hour.

Tap B fills $\frac{1}{15}$ th part of the cistern in 1 hour.

Tap C empties out $\frac{1}{10}$ th part of the cistern in 1 hour.

Thus, in one hour, $\left(\frac{1}{12}+\frac{1}{15}-\frac{1}{10}\right)$ th part of the cistern is filled.

We have :

$\frac{1}{12}+\frac{1}{15}-\frac{1}{10}=\frac{10+8-12}{120}=\frac{6}{120}=\frac{1}{20}$

Thus, in 1 hour, $\frac{1}{20}$ th part of the cistern is filled.

Hence, the cistern will be filled completely in 20 hours if all the three taps are opened together.

Time and Work Ex 11.1 Q28

Answer :

Time taken by the tap to fill the cistern $= 4$ hours

$\therefore$ Tap fills $\frac{1}{4}$ th part of the cistern in 1 hour.

Time taken by the pipe to empty the cistern $= 6$ hours

$\therefore$ Pipe empties out $\frac{1}{6}$ th part of the cistern in 1 hour.

Thus, in 1 hour, $\left(\frac{1}{4} - \frac{1}{6}\right)$ th part of the cistern is filled.

We have :

$\frac{1}{4} - \frac{1}{6} = \frac{6-4}{24} = \frac{2}{24} = \frac{1}{12}$

Thus, in 1 hour, $\frac{1}{12}$ th part of the cistern is filled.

Hence, the cistern will be filled in 12 hours.

********** END **********