1. A tap can fill a tank in 6 hours. After half the tank is filled, three more similar taps are opened. What is the total time taken to fill the tank completely?

a. 3 hrs 15 min

b. 3 hrs 45 min

c. 4 hrs

d. 4 hrs 15 min -→B

Ans: B

Time taken by one tap to fill half the tank = 3 hrs.

Part filled by the four taps in one hour = $\left(4 \times \dfrac{1}{6}\right) = \dfrac{2}{3}$.

Remaining part = $\dfrac{1}{2}$.

∴ $\dfrac{2}{3} : \dfrac{1}{2} :: 1 : x$ or $x = \left(\dfrac{1}{2} \times 1 \times \dfrac{3}{2}\right) = \dfrac{3}{4}$ hrs i.e. 45 min.

So, total time taken = 3 hrs 45 min.

2. A tap can fill a tank in 48 minutes whereas another tap can empty it in 2 hours. If both the taps are opened at 11 : 40 A.M., then the tank will be filled at

a. 12 : 40 P.M.

b. 1 : 00 P.M.

c. 1 : 20 P.M.

d. 1 : 30 P.M.

Ans: B

Net part filled in 1 hour $= \left(\dfrac{1}{48} - \dfrac{1}{120} \right) = \dfrac{3}{240} = \dfrac{1}{80}$.

∴   The tank will be filled 80 mins i.e. 1 hour 20 min.
after 11 : 40 A.M. i.e. at 1 P.M.

3. The petrol tank of an automobile can hold g litres. If a litres
was removed when the tank was full, what part of the full tank
was removed?

a. g − a

b. g/a

c. a/g

d. (g-a) / a

e. (g − a) / g

Ans: C

Required part $= \dfrac{\text{Quantity removed}}{\text{Total capacity}} = \dfrac{a}{g}$.

4. Three pipes A, B and C can fill a tank 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 number of hours taken by C alone to fill the tank is

a. 10

b. 12

c. 14

d. 16

Ans: C

Part filled in 2 hours $= \frac{2}{6} = \frac{1}{3}$, Remaining part $= \left(1 - \frac{1}{3}\right) = \frac{2}{3}$.

∴ (A + B)'s 7 hour's work $= \frac{2}{3}$; (A + B)'s 1 hour's work $= \frac{2}{21}$.

∴ C's 1 hour's work = [(A + B + C)'s 1 hour's work − (A + B)'s 1 hour's work]

$$= \left(\frac{1}{6} - \frac{2}{21}\right) = \frac{1}{14}.$$

∴ C alone can fill the tank in 14 hours.

5. Two pipes A and B can fill a tank in 20 and 30 minutes respectively. If both the pipes are used together, then how long will it take to fill the tank?

    a. 12 min

    b. 15 min

    c. 25 min

    d. 50 min

      Ans: A

Part filled by A in 1 min. $= \dfrac{1}{20}$; Part filled by B in 1 min. $= \dfrac{1}{30}$.

Part filled by (A + B) in 1 min. $= \left(\dfrac{1}{20} + \dfrac{1}{30} \right) = \dfrac{1}{12}$.

$\therefore$ Both the pipes can fill the tank in 12 minutes.