Aptitude Shortcuts and Mind Tricks for Boats and Streams Problems Type-II

EXAMPLE QUESTION:

A man can row (28/3) km/hr in still water and finds that it takes him thrice as much time to row upstream than as to row downstream the same distance in the stream. What is the speed of the current?

GIVEN

Speed of man in still water, a = (28/3) km/hr

Time taken to travel upstream is **thrice** as much as the time taken to travel downstream

SOLUTION

NORMAL METHOD

Let the speed upstream = u km/hr

Then the speed downstream = 3u km/hr

Now the **Speed of man in still water = (1/2) × (speed downstream + speed upstream)**

Therefore, Speed in still water = (1/2) × (3u + u) = (1/2) × (4u)

= 2u km/hr

Now speed of man in still water is given as (28/3) km/hr in the question

Therefore, 2u = (28/3)

u = (14/3)

So, **Speed upstream** = u = **(14/3) km/hr**

Speed downstream = 3u = 3 × (14/3) km/hr = **14 km/hr**

Now, **Speed of Current = (1/2) × (speed downstream – speed upstream)**

= (1/2) × (14 – [14/3])

= (1/2) × ([42 – 14]/3)

= (1/2) × (28/3)

Therefore, the **speed of current = (14/3) km/hr**

ALTERNATE METHOD

Speed of current = Speed of man in still water × ($[T_1-T_2] / [T_1+T_2]$)

T_1 = time taken to go upstream

T_2 = time taken to go downstream

As per the question, $T_1 = 3T_2$

Where, speed of man in still water = (28/3) km/hr

Speed of current = $(28/3) \times ([3T_2-T_2] / [3T_2+T_2])$

= (28/3) × (2/4)

= (28/3) × (1/2)

Therefore, **Speed of current = (14/3) km/hr**