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GATE PYQs

Boats & Streams

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$S_u = x - y$, $S_d = x + y$

$t_u = 3 \times t_d$

$\Rightarrow \frac{D}{x-y} = 3 \times \frac{D}{x+y}$

$\Rightarrow x + y = 3(x - y)$

$\Rightarrow 8 + y = 3 \times 8 - 3y$

$\Rightarrow 4y = 24 - 8 \Rightarrow y = \frac{16}{4} \Rightarrow$ **$y = 4$ km/h**

Ans

GATE2014 EC-3: GA-8

A man can row at 8 km per hour in still water. If it takes him thrice as long to row upstream, as to row downstream, then find the stream velocity in km per hour.

Speed of man $(m) = 8\ km/h$
Let the speed of stream be s

According to the question:
Speed of man upstream $= S_1 = m - s$
Speed of man downstream $= S_2 = m + s$

Speed = Distance/Time
Here, since the distance D is same,

$$D = S_1 \times T_1 = S_2 \times T_2$$

$$S_1 \times T_1 = S_2 \times T_2$$

$$\implies \frac{S_1}{S_2} = \frac{T_2}{T_1} = 1/3$$

$$m + s = 3(m - s)$$

or, $8 + s = 3(8 - s)$

$$\implies s = 4\ km/h$$

NIELIT 2022 April Scientist B

A man rows downstream at $20\ \mathrm{km/hr}$ and rows upstream at $15\ \mathrm{km/hr}$. At what speed he can row in still water ?

A. $17.5\ \mathrm{km/hr}$
B. $18\ \mathrm{km/hr}$
C. $20.5\ \mathrm{km/hr}$
D. $22\ \mathrm{km/hr}$

Speed in still water = x km/h
Speed of stream = y km/h
$S_d = 20$ km/h, $S_u = 15$ km/h

$S_d = x + y$

$20 = x + y \quad \text{—①}$

$S_u = x - y$

$15 = x - y \quad \text{—②}$

$\boxed{x = 17.5 \text{ km/h}}$

① + ②

$\Rightarrow 20 + 15 = 2x$

$\Rightarrow 35 = 2x \quad \Rightarrow x = \frac{35}{2} = 17.5 \text{ km/h}$

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Let us assume,

The speed of the of the boat =B km/hr

The speed of the stream=S km/hr

A man rows downstream at 20 km/hr.

so ,**B+S=20----------(1)**

The man rows upstream at 15km/hr.

so , B-S=15 .....(2)

here they have asked the speed of the boat at still water .

Adding (1)+(2) we get ,

2B=35

=>B=17.5 km/hr

So correct answer is (A).


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