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SOLUTION OF BOAT&STREAM WITH EXPLANATION

1B

Speed of the boat upstream = 36/9 = 4 kmph

Speed of the boat in downstream = 36/6 = 6 kmph

Speed of stream = 6-4/2 = 1 kmph

2A

$$\frac{d}{5-1} + \frac{d}{5+1} = \frac{75}{60}$$

$$\frac{d}{4} + \frac{d}{6} = \frac{5}{4}$$

5d/12 = 5/4 => **d = 3 k**

3C

d/45 - d/50 = 1

=> d = 450 kms.

Hence, the total distance he covered in his way = **d + d = 2 d = 2 x 450 = 900 kms.**

4C 9km/h

5B

Sum of upstream & downstream= (X-Y) +(X+Y)= 2X

So, 2X= 40

X= 20 km/hr

Speed of boat : speed of stream= 600+100 :100= 7:1

So speed of Stream= 20/7 km/hr

ATQ, D/(X-Y) + D/(X+Y) = 5

D/(120/7) + D/(160/7)= 5

D= 480×5/49= 48.97 km= 50 Km(approx)

6D

(x+y)/y = 9/1 9y = x + y

x = 8y

y = 3 km/hr

So, x = 24 km/hr

Upstream speed = 24-3 = 21 km/hr

Hence, distance travelled upstream in 5 hours = 21*5 = 105 km

7D

Speed of streamer = 4.5 km/hrSpeed of water = 1.5 km/hr

Downstream speed = 4.5+1.5 = 6 km/hr

Upstream speed = 4.5 -1.5 = 3 km/hr

Average Speed = (6 X 3) / 4.5 = 4km/hr

8C

Speed of the stream = 1/2 x (a–b) kmph

Speed downstream a = 12kmph

Speed upstream b = 8 kmph

Speed of the stream = 1/2 x (a–b) = 1/2 x (12–8)= 4/2 = 2 kmph

9A

Speed in downstream = (14 + 4) km/hr = 18 km/hr;

Speed in upstream = (14 – 4) km/hr = 10 km/hr.

Let the distance between A and B be x km. Then,

x/18 + (x/2)/10 = 19 ⇔ x/18 + x/20 = 19 ⇒ x = 180 k

10B

B-S = 15/5 = 3 km/h

Again B= 4S

Therefore B-S = 3= 3S

=> S = 1 and B= 4 km/h

Therefore B+S = 5km/h

Therefore, Time during downstream = 15/5 = 3h

11B

Speed of the stream = 1

Motor boat speed in still water be = x kmph

Down Stream = x + 1 kmph

Up Stream = x - 1 kmph

[35/(x + 1)] + [35/(x - 1)] = 12

x = 6 kmph

12C

Speed in still water = 6 kmph

Stream speed = 1.2 kmph

Down stream = 7.2 kmph

Up Stream = 4.8 kmph

x/7.2 + x/4.8 = 1

x = 2.88

Total Distance = 2.88 x 2 = 5.76 kms

13B

$$\mathbf{2\ x\ \frac{28}{p+q} = \frac{28}{p-q}}$$

=> 56p - 56q -28p - 28q = 0

=> 28p = 84q

=> p = 3q.

Now, given that if

$$\mathbf{\frac{28}{3q+2q} + \frac{28}{3q-2q} = \frac{672}{60}}$$

$$\mathbf{=> \frac{28}{5q} + \frac{28}{q} = \frac{672}{60}}$$

$$\mathbf{=> q = 3\ kmph}$$

$$\mathbf{=> x = 3q = 9\ kmph}$$

Hence, **the speed of the boat = p kmph = 9 kmph and the speed of the river flow = q kmph = 3 kmph.**

14B

If t1 and t2 are the upstream and down stream times. Then time taken in still water is given by

$$\frac{2\times t1\times t2}{t1+t2} = \frac{2\times 12\times 24}{36} = 16h$$

15D
Speed of Boy is B = 4.5 kmph
Let the speed of the stream is S = x kmph
Then speed in Down Stream = 4.5 + x
speed in Up Stream = 4.5 - x
As the distance is same,
=> 4.5 + x = (4.5 - x)2
=> 4.5 + x = 9 -2x
3x = 4.5
x = 1.5 kmph

16A
Speed in still water = Average of Speed in Upstream and speed in Downstream
= 1/2 (12 + 6) kmph = 9 kmph.

17C
Given speed of the person = 8 1/2 = 17/2 kmph
Let the speed of the stream = x kmph
speed of upstream = 17/2 - x
speed of downstream = 17/2 + x
But given that,
2(17/2 - x) = 17/2 + x
=> 3x = 17/2
=> x = 2.83 kmph.

18B
$\frac{12}{9+x} + \frac{12}{9-x} = 3\ h$
$3x^2 = 27$

=> x = 3 kmph

19A
i.e, $\frac{\mathbf{d}}{\mathbf{8-C}} = \mathbf{3} \times \frac{\mathbf{d}}{\mathbf{8+C}}$

$\Rightarrow 24 - 3C = 8 + C$
$\Rightarrow 4C = 16$
$\Rightarrow \mathbf{C = 4\ kmph}$

20B
Given, **U + D = 82**
b - w + b + w = 82
2b = 82
=> **b = 41 kmph**
From the given data,
41 - w = 105/3 = 35
w = 6 kmph
Now,
b + w = 126/t
=> 41 + 6 = 126/t
=> **t = 126/47 = 2.68 hrs.**

21A

(p + s) x 10 = (p - s) x 15

2p + 2s = 3p - 3s

=> p : s = 5 : 1

22A

Speed of the current = 24-16/2

= 8/2

= 4 km/hr.

23C

d/x+y + d/x-y = 5h 15m or 21/4 hrs .....(i)

and 2d/x-y = 7..... (ii)

From eq. (i) and (ii)

2d/x+y = 7/2

Hence, Amith will take to row 2d km distance downstream in 7/2 hrs

= 3.5 hrs

= 3 hrs 30 min.

24D

Speed in upstream = Distance / Time = 3 x 60/20 = 9 km/hr.

Speed in downstream = 3 x 60/18 = 10 km/hr

Rate of current = (10-9)/2 = 1/2 km/hr.

25A

Speed of the boat downstream s=a/t= 60/3 = 20 kmph

Speed of the boat upstream s= d/t = 30/3= 10 kmph

Therefore, The speed of the stream = $\frac{speed\ of\ downstream - speed\ of\ upstream}{2}$ =5 kmph