Boats & Streams - Solved Examples

Q 1 - Speed of boat in still water is 16 km/hr. If the speed of the stream is 4 km/hr, find its downstream and upstream speeds.

A - 15,5

B - 20,12

C - 10,6

D - 18,10

Answer - B

Explanation

```
Downstream Speed = u + v = 16 + 4 = 20 km/hr
Upstream Speed = u - v = 16 - 4 = 12 km/hr
```

Q 2 - A man can row downstream at 18 km/hr and upstream at 12 km/hr. Find his speed in still water and the rate of the current.

A - 16,3

B - 15,4

C - 15,3

D - 16,4

Answer - C

Explanation

```
Speed of the boat or swimmer in still water = 1/2 * (Downstream Speed + Upstream Speed)
 = 1/2 * (18+12)
 = 15 km/hr
Speed of the current  = 1/2 * (Downstream Speed - Upstream Speed)
 = 1/2 * (18-12)
 = 3 km/hr
```

Q 3 - A man swims downstream 28 km in 4 hrs and upstream 12 km in 3 hrs. Find his speed in still water and also the speed of the current.

A - 5,2

B - 5.5,1.5

C - 5.5,2.5

D - 5,1

Answer - B

Explanation

```
Downstream Speed (u) = 28/4 = 7 km/hr
Upstream Speed (v) = 12/3  = 4 km/hr
Speed of the boat or swimmer in still water = 1/2*(Downstream Speed + Upstream Speed)
 = 1/2*(7+4)
 = 5.5 km/hr
Speed of the current  = 1/2*(Downstream Speed - Upstream Speed)
```

```
= 1/2*(7-4)
= 1.5 km/hr
```

Q 4 - The speed of the boat in still water is 15 km/hr. It takes twice as long as to go upstream to a point as to return downstream to the starting point. What is the speed of the current?

A - 4 km/hr

B - 3 km/hr

C - 2 km/hr

D - 5 km/hr

Answer - B

Explanation

```
Let speed of the current = S km/hr.

As per question,
Downstream Speed = 2*Upstream speed
15 + S = 2(15 - S)
S = 3 km/hr
```

Q 5 - A boat covers a certain distance downstream in 6 hours and takes 8 hours to return upstream to the starting point. If the speed of the stream is 3 km/hr, find the speed of the boat in still water.

A - 1 km/hr

B - 4 km/hr

C - 3 km/hr

D - 2 km/hr

Answer - C

Explanation

```
t1 = 6 hrs
t2 = 8 hrs
v = 3 km/hr
u = ?

We know,
(u + v)t1 = (u - v)t2

(u + 3)6 = (u - 3)8
u = 3 km/hr
```

Q 6 - The speed of river Ganga is 5 km/hr. A motor boat travels 28 km upstream and then returns downstream to the starting point. If its speed in still water be 9 km/hr, find the total journey time.

A - 5 hr

B - 8 hr

C - 9 hr

D - 10 hr

Answer - C

Explanation

```
We know, Downstream speed = u + v = 9 + 5 = 14 km/hr
Upstream Speed = u - v = 9 - 5 = 4 km/hr
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```
Speed = Distance/Time
∴ Time = Distance/Speed
∴ Total time taken = t1 + t2
= 28/4 + 28/14
= 7 + 2 = 9 hr
```

Q 7 - A boat travels 32 km upstream and 60 km downstream in 9 hr. Also it travels 40 km upstream and 84 km downstream in 12 hrs. Find the speed of the boat in still water and rate of the current.

A - 10,2

B - 8,4

C - 9,3

D - 7,5

Answer - A

Explanation

```
Let, upstream speed = u km/hr
Downstream speed = d km/hr

32/u + 60/d = 9   (Time = Distance/Speed)

Simlarly,
40/u + 84/d = 12

32x + 60y = 9  ...(i)   (Assuming 1/u = x and 1/d = y)
40x + 84y = 12 ...(ii)

(Equation(ii) * 4) - (Equation (i)*5), we get,
y = 1/12. So, x = 1/8
```

```
Hence, downstream speed = 12 km/hr
Upstream speed = 8 km/hr

So,
Speed of the boat in still water = 1/2*(12+8) = 10 km/hr
Speed of the current = 1/2*(12 - 8) = 2 km/hr
```

Q 8 - The speed of a swimmer in still water is 12km/hr. It takes 6 hrs to swim to a certain distance and return to the starting point. The speed of current is 4km/hr. Find the distance between the two points.

A - 15 km

B - 16 km

C - 14 km

D - 12 km

Answer - B

Explanation

```
Let distance = D
Downstream time = t1; Downstream Speed = 1/2*(12+4) = 8 km/hr
Upstream Time = t2; Upstream Speed = 1/2*(12-4) = 4 km/hr

Total time = t1 + t2
6 = (D/Upstream speed) + (D/Downstream speed)
6 = D/8 + D/4
D = 16 km
```

Q 9 - A boat running downstream covers a distance of 30 kms in 2 hrs. While coming back the boat takes 6 hrs to cover the same distance. If the speed of the current is half that of the boat, what is the speed of the boat?

A - 15 km/hr

B - 54 km/hr

C - 10 km/hr

D - None of these

Answer - C

Explanation

```
Downstream Speed = 30/2 = 15 km/hr
Upstream Speed = 30/6 = 5 km/hr
Speed of the boat in still water = 1/2*(downstream speed + upstream speed)
= 1/2*(15+5)
= 10 km/hr
```

Q 10 - A steamer goes downstream from one point to the other in 4 hrs. It covers the same distance upstream in 5 hrs. If the speed of the stream is 2 km/hr, the distance between the two pints is

A - 50 km

B - 60 km

C - 70 km

D - 80 km

Answer - D

Explanation

```
Let the distance be D km.
∴ Downstream Speed = D/4 km/hr
And Upstream Speed = D/5 km/hr
Given, Speed of current = 2 km/hr

Speed of the current  = 1/2*(Downstream Speed - Upstream Speed)
2 = 1/2*(D/4 - D/5)
D = 80 km
```