

## BOATS & STREAMS

1. A boat takes 19 hours for travelling downstream from point A to Point B and coming back to a Point C midway between A and B. If the velocity of the stream is 4 kmph and the speed of the boat in still water is 12 kmph, what is the distance between A and B?

- A. 160 km
- ☒ B. 152 km
- C. 200 km
- D. 220 km

2. If a man rows at the rate of 5 kmph in still water and his rate against the current is 3.5kmph. then the man's rate along the current is:

- A. 5 kmph
- B. 6 kmph
- ☒ C. 6.5 kmph
- D. 7.5 kmph

3. Speed of a boat in still water is 8 kmph and speed of stream is 1.5 kmph. A man rows to a place at a distance of 61.75 km and come back to starting point. The total time taken by him.

- A. 6 hrs
- B. 8 hrs
- ☒ C. 16 hrs
- D. 22 hrs

4. A man can row upstream at 7 kmph and downstream at 10 kmph. Find man's rate still water and the rate of current.

- A. 4 km/hr and 1 km/hr
- B. 8.5 km/hr and 1.5 km/hr
- C. 6 km/hr and 2 km/hr
- D. 6 km/hr and 3 km/hr

5. Speeds of a boat along and against the current are 12 km/hr and 8 km/hr respectively. Then the speed of the current in km/hr is

- A. 5 km/hr
- B. 4 km/hr
- C. 3 km/hr
- D. 2 km/hr

6. A man can row 5 km/h in still water. If the speed of the current is 1 km/h, it takes 3h more in upstream than in the downstream for the same distance. The distance is:

- A. 36 km
- B. 24 km
- C. 20 km
- D. 32 km

7. A boatman goes 2 km against the current of the stream in 1 h and goes 1 km along the current in 10 min. How long will he take to go 5 km in stationary water?

- A. 1 h 30 min
- B. 1 h 15 min
- C. 1 h
- D. 40 min

8. If downstream speed of a boat is 16 kmph and its upstream speed is 11 kmph, what is the speed of stream?

- A. 1.5 kmph
- B. 2 kmph
- C. 3 kmph
- D. 2.5 kmph

9. A sailor sails a distance of 48 km along the flow of a river in 8 h. If it takes 12 h to return the same distance, then the speed of the flow of the river is

- A. 0.5 km/hr
- B. 1 km/hr
- C. 1.5 km/hr
- D. 2 km/hr

10. A boat covers a distance of 30 km downstream in 2 hours while it take 6 hours to cover the same distance upstream. If the speed of the current is half of the speed of the boat then what is the speed of the boat in km per hour ?

- A. 15 kmph
- B. 5 kmph
- C. 10 kmph
- D. None of these

11. Two boats A and B start towards each other from two places, 150 km apart. Speed of the boat A and B in still water are 16 km/hr and 14 km/hr respectively. If A proceeds down and B up the stream, they will meet after.

- A. 5 hours
- B. 4 hours
- C. 4.5 hours
- D. 6 hours

12. A swimmer swims from a point A against a current for 10 minutes before he reaches point C and then swims back along the current for next 10 minutes and comes to point B. If the distance between A and B is 200 metres, find the speed of the current (in kmph) :

- A. 0.6
- B. 0.5
- C. 0.4
- D. 0.9

13. A, B and C are situated at the bank of river which is flowing at a constant rate. B is at an equal distance with A and C. A swimmer Avinash takes 10 h to swim from A to B and B to A. Also, he takes 4 h to swim from A to C. What is the ratio of speed of Avinash in still water and speed of stream?

- A. 2 : 5
- B. 3 : 5
- C. 5 : 3
- D. 1 : 2

14. Amit goes Mumbai to Kolkata by sea route. The speed of the boat in still water is 60 km/h and speed of the current is 15 km/h. After reaching Kolkata he stayed there for 20 minutes and after that come back by same boat. The time taken by him in this journey is 19 hours 32 minutes, find the distance travel by him in one side.

- A. 450 km
- B. 360 km
- C. 540 km
- D. 600 km

15. The ratio of the speed of boat in still water to the speed of stream is 16 : 5. A boat goes 16.5 km in 45 minute upstream, find the time taken by boat to cover the distance of 17.5 km downstream.

- A. 30 minutes
- B. 25 minutes
- C. 50 minutes
- D. 45 minutes

16. Distance between a point of A and point B in a river is 12 km and the flow of the stream is from A to B. If the speed of the boat is 4 km/h and speed of the stream is 2 km/h. The boat goes from B to A and then comes back. What is the distance between point A and the boat after 7 hours of travel since the time of starting?

- A. 2 km
- B. 3 km
- C. 4 km
- D. 6 km

17. The ratio of the speed of boat in still water to the speed of stream is 16 : 5. A boat goes 16.5 km in 45 minute upstream, find the time taken by boat to cover the distance of 17.5 km downstream.

- A. 30 minutes
- B. 25 minutes
- C. 50 minutes
- D. 45 minutes

18. A steamer can go 12 km in still water in 25 minutes. One day, it went 11.25 km upstream and returned the same distance in downstream. If the difference between the time taken to travel upstream and downstream was 12.5 minutes, then what was the speed of stream in km per hour?

- A. 7.2
- B. 5.4
- C. 6.3
- D. 4.5

19. There are 3 points P, Q and R in a straight line, such that point Q is equidistant from points P and R. A man can swim from point P to R downstream in 24 hours and from Q to P upstream in 16 hours. Find the ratio of speed of man in still water to speed of stream?

- A. 5 : 1
- B. 6 : 1
- C. 5 : 3
- D. 7 : 1

20. Rohit can row a boat 65Km upstream and 130Km downstream in 23 hours, whereas he can swim 45Km upstream and 104Km downstream in 17 hours. Find the speed of boat in still water and the speed of stream.

- A. 4km/h, 9km/h

- B. 8km/h, 5km/h
- C. 9km/h, 4km/h
- D. 5km/h, 8km/h

**Answers:**

**1. B**

**Solution:** Speed downstream =  $(12 + 4)\text{km/hr} = 16 \text{ km/hr}$ ;

Speed upstream =  $(12 - 4) \text{ km/hr} = 8 \text{ km/hr}$ .

Let the distance between A and B be  $x \text{ km}$ , Then,

$$(x/16) + (x / 2)/8 = 19$$

$$\Leftrightarrow (x/16) + (x/16) = 19$$

$$\Leftrightarrow 2x/16 = 19$$

$$\Leftrightarrow x = 152 \text{ km}.$$

**2. C**

**Solution:** Given,

Upstream rate = 3.5 kmph, Speed of a man in still water = 5 kmph

Let the downstream rate be  $x \text{ kmph}$ , then

By the short trick approach, we get

Speed of the man (boat) in still water =  $1/2$

[DOWNSTREAM rate + UPSTREAM rate]

$$\Rightarrow 5 = (1/2)(x + 3.5) \text{ or } x = 6.5 \text{ kmph}$$

**3. C**

**Solution:** Rate upstream =  $8 - 1.5 = 6.5 \text{ kmph}$

Rate downstream =  $8 + 1.5 = 9.5 \text{ kmph}$

Time taken to go upstream =  $61.75/6.5 = 9.5 \text{ hr}$ .

Time taken to go downstream =  $61.75/9.5 = 6.5 \text{ hr}$ .

Total time =  $9.5 + 6.5 = 16 \text{ hrs}$ .

**4. B**

**Solution:** Rate in still water =  $(1/2)(10 + 7)$  km/hr = 8.5 km/hr

Rate of current =  $(1/2)(10 - 7)$  km/hr = 1.5 km/hr.

**5. D**

**Solution:** To solve this question, we can apply a short trick approach;

Speed of current

$$= (1/2) (\text{Rate of downstream} - \text{Rate of upstream})$$

By the short trick approach, we get

$$= (1/2)(12 - 8) = (1/2) \times 4 = 2 \text{ km/hr}$$

**6. A**

**Solution:** To solve this question, we can apply a short trick approach;

A man can row  $x$  kmph in still waters. If the river is running at  $y$  kmph, it takes  $T$  hrs more in upstream then to

go downstream for the same distance, then the distance is given

$$\text{by } [(x^2 - y^2)T/2Y] \text{ km}$$

By the short trick approach, we get

$$= [(5^2 - 1^2) \times 3] / (2 \times 1) \text{ km} = 72/2 \text{ km} = 36 \text{ km}$$

**7. B**

**Solution:** Rate downstream

$$= (1/10) \times 60 \text{ km/hr} = 6 \text{ km/hr};$$

Rate upstream = 2 km/hr.

Speed in still water

$$= (1/2)(6 + 2) \text{ km/hr} = 4 \text{ km/hr}.$$

$\therefore$  Required time

$$= (5/4) \text{ hrs} = 1(1/4) \text{ hrs} = 1 \text{ hr } 15 \text{ min}$$

**8. D**

**Solution:** To solve this question, we can apply a short trick approach;

Speed of current

$$= (1/2)(\text{Rate of downstream} - \text{Rate of upstream})$$

By the short trick approach, we get

$$= (1/2)(16 - 11) = 5/2 = 2.5 \text{ kmph.}$$

**9. B**

**Solution:** Rate downstream =  $48/8 = 6 \text{ km/hr}$ ,

Rate upstream =  $48/12 = 4 \text{ km/hr}$

Speed of current =  $(1/2) [\text{Downstream rate} - \text{Upstream rate}]$

$$= 1 [6 - 4]$$

2 Speed of the current =  $1 \text{ km/hr}$ .

**10. C**

**Solution:** Here downstream speed =  $15 \text{ km/hr}$  and upstream speed =  $5 \text{ km/hr}$

$$\therefore \text{Speed of the boat} = (15 + 5)/2 = 10 \text{ km/h}$$

**11. A**

**Solution:** Let the speed of the stream be  $x \text{ kmph}$  and both the boats meet after  $t$  hours.

According to the question,

Distance covered while going downstream + Distance covered while going upstream = Total Distance

$$\Rightarrow (16 + x)t + (14 - x)t = 150$$

$$\Rightarrow 16t + 14t = 150$$

$$\Rightarrow 30t = 150$$

$$\Rightarrow t = 5 \text{ hrs}$$

**12. A**

**Solution:** The distance covered against the current =  $AC = d \text{ metres}$

Given  $AB = 200 \text{ metres}$

$$\therefore BC = (200 + d) \text{ metres}$$



Let the speed of the man be  $u$  metres per minute and that of the current be  $v$  metres per minute

$\therefore$  Rate upstream =  $(u - v)$  m/min and Rate downstream =  $(u + v)$  m/min

Now,  $d/(u-v)$

= 10 ... (i)

$\Rightarrow d = 10(u - v)$

Again,  $(200 + d) / (u + v) = 10$  ... (ii)

Putting the value of  $d$  in eq (ii)

$$200 + 10(u - v) = 10u + 10v$$

$$\Rightarrow 200u + 10u - 10v = 10u + 10v$$

$$\Rightarrow 20v = 200$$

$$\Rightarrow v = 10 \text{ m/min}$$

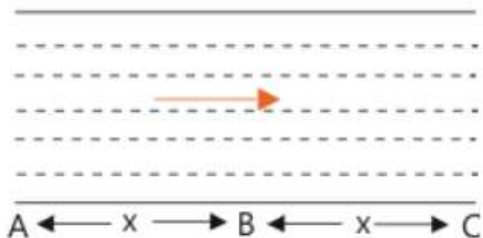
$\therefore$  speed of the current

$$= (10/1000) \times 60 \text{ kmph} = 0.6 \text{ kmph}$$

**13. C**

**Solution:** Let speed of Avinash in still water =  $a$  km/h

and speed of stream =  $b$  km/h



From first condition

$$x / (a + b) + x / (a - b) = 10 \text{ .. (i)}$$

From second condition,



$$2x / (a + b) = 4$$

$$\Rightarrow x / (a + b) = 2 \text{ ..(ii)}$$

From Eqn. (i) and (ii) , we get

$$2 + x / (a - b) = 10$$

$$\Rightarrow x / (a - b) = 8 \text{ ... (iii)}$$

From Eqn. (ii) and (iii), we get,

$$a + b / a - b = 8/2 = 4$$

$$\Rightarrow a + b = 4a - 4b$$

$$\Rightarrow 3a = 5b$$

$$\Rightarrow a : b = 5 : 3$$

**14. C**

**Solution:** Time taken by him in travelling = 19 hours 32 minutes - 20 minutes

= 19 hours 12 minutes

Let Distance = x km

According to the question,

$$(X/60+15) + (X/60-15) = 19(12/60)$$

$$(x/75) + (x/45) = 96/5$$

$$(5x+3x)/225 = 96/5$$

$$8x/225 = 96/5$$

$$x = 540 \text{ km}$$

**15. B**

**Answer:** Let the speed of boat in still water = 16x, speed of stream = 5x

Upstream speed = 16x - 5x = 11x

$$S = D/t$$

$$11x = (16.5/45) \times 60$$

$$x = 2$$

speed of boat in still water = 32 km/h, speed of stream = 10 km/h

Downstream speed =  $32 + 10 = 42$  km/h

Distance = 17.5 km

time =  $17.5 / 42$

=  $5/12$  hour

or

=  $5/12 \times 60 = 25$  minutes

#### 16. D

**Solution:** The resulting speed in upstream is  $4 - 2 = 2$  km/h.

And the resulting speed in downstream is  $4 + 2 = 6$  km/h.

Since the boat is moving upstream from B to A.

So time taken is  $12/2 = 6$  hours

Now in downstream it takes  $12/6 = 2$  hours

So in 1 hour it will travel half the distance = 6 km.

So the distance of the boat from point A after 7 hours of travel will be 6 km.

#### 17. B

**Solution:** Let the speed of boat in still water =  $16x$ , speed of stream =  $5x$

Upstream speed =  $16x - 5x = 11x$

$S = D/t$

$11x = 16.5/45 \times 60$

$x = 2$

speed of boat in still water = 32 km/h, speed of stream = 10 km/h

Downstream speed =  $32 + 10 = 42$  km/h

Distance = 17.5 km

time =  $17.5/42$

=  $5/12$  hour

or  $5/12 \times 60 = 25$  minutes

**18. A**

**Solution:** In still water, the speed of steamer =  $12000/25$

= 480 meter per minute = 8 meters per second

Let the speed of stream =  $v$  m/sec

In upstream, the speed of steamer =  $(8 - v)$  m/sec

In downstream, the speed of steamer =  $(8 + v)$  m/sec

According to the question,

$11250/(8 - v) - 11250/(8 + v) = 12.5 \times 60 = 750$  seconds

By solving,  $v = 2$  meters per second

=  $(2 \times 18)/5 = 7.2$  km per hour

**19. D**

**Solution:** Let speed of man in still water =  $x$  km/h

Speed of current =  $y$  km/h

Downstream speed =  $(x + y)$  km/h

Upstream speed =  $(x - y)$  km/h

Let  $PQ = QR = A$  and  $PR = 2A$

So,

$2A/(x + y) = 24$  and  $A/(x - y) = 16$

By dividing both equations-

$\Rightarrow$

$2A(x - y)/A(x + y) = 24/16$

$\Rightarrow 4x - 4y = 3x + 3y$

$\Rightarrow x/y = 7/1$

Required ratio = Speed of man in still water : Speed of current  $\Rightarrow 7 : 1$

**20. C**

**Solution:** Upstream,  $U$  = Speed of boat – speed of stream

Downstream,  $D$  = Speed of boat + speed of stream

$$65/U + 130/D = 23$$

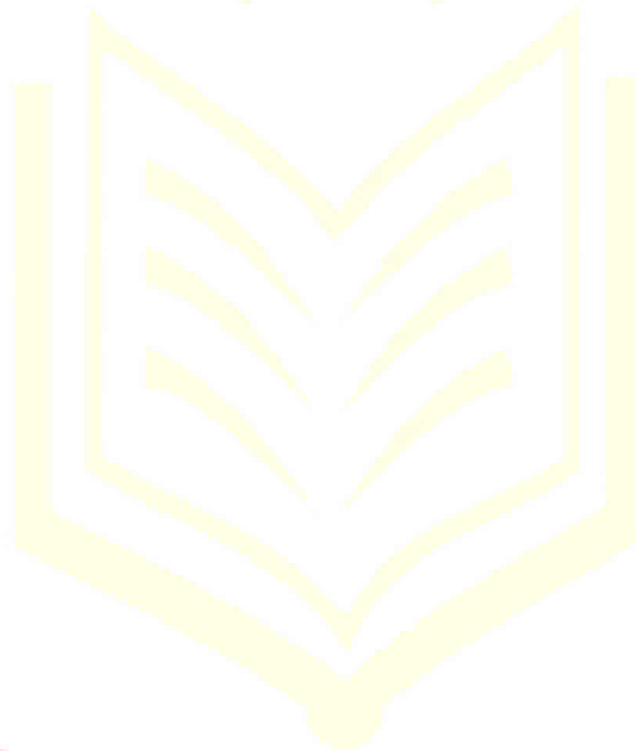
$$45/U + 104/D = 17$$

On solving the above two equations, we will get

$$U = \text{Speed of boat} - \text{speed of stream} = 5$$

$$D = \text{Speed of boat} + \text{speed of stream} = 13$$

Thus, Speed of boat = 9 and speed of stream = 4



OnlineStudy4u