



## SSC CGL Boat and Stream Questions PDF

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## Instructions

For the following questions answer them individually

### Question 1

A boat covers 12 km upstream in 4 hours and can cover the same distance downstream in 3 hours. What is the speed (in km/hr) of the boat in still water?

- A 3.5
- B 3
- C 2.5
- D 2

**Answer:** A

#### Explanation:

Let speed of boat in still water =  $x$  km/hr and speed of current =  $y$  km/hr

Speed upstream =  $(x - y)$  km/hr

Using, speed = distance/time

$$\Rightarrow x - y = \frac{12}{4} = 3 \text{ -----(i)}$$

$$\text{Similarly, downstream speed} = x + y = \frac{12}{3} = 4 \text{ -----(ii)}$$

Adding equations (i) and (ii), we get :  $2x = 3 + 4 = 7$

$$\Rightarrow x = \frac{7}{2} = 3.5 \text{ km/hr}$$

$\Rightarrow$  Ans - (A)

### Question 2

Two boat are travelling with speed of 36 km/hr and 54 km/hr respectively towards each other. What is the distance (in metres) between the two boats one second before they collide?

- A 10
- B 15
- C 25
- D 5

**Answer:** C

#### Explanation:

Relative speed of boats (since they are travelling towards each other =  $36 + 54 = 90$  km/hr

$$= (90 \times \frac{5}{18}) \text{ m/s} = 25 \text{ m/s}$$

Distance between them one second before they collide = Distance covered in 1 second = **25 m**

=> Ans - (C)

### Question 3

A boat goes 15 km upstream and 22 km downstream in 5 hours. It goes 20 km upstream and  $\frac{55}{2}$  km downstream in  $\frac{13}{2}$  hours. What is the speed (in km/hr) of stream ?

A 3

B 5

C 8

D 11

**Answer:** A

### Explanation:

Let speed of boat =  $x$  km/hr and speed of stream =  $y$  km/hr

=> Downstream speed =  $(x + y)$  km/hr and Upstream speed =  $(x - y)$  km/hr

According to ques,

$$\Rightarrow \frac{15}{x-y} + \frac{22}{x+y} = 5$$

$$\text{and } \frac{20}{x-y} + \frac{27.5}{x+y} = 6.5$$

$$\text{Let } \frac{1}{x-y} = m \text{ and } \frac{1}{x+y} = n$$

$$\Rightarrow 15m + 22n = 5 \text{ and } 20m + 27.5n = 6.5$$

$$\text{Solving above equations, we get : } m = \frac{1}{5} \text{ and } n = \frac{1}{11}$$

$$\text{Thus, } x - y = 5 \text{ and } x + y = 11$$

$$\text{Subtracting both equation, } \Rightarrow 2y = 11 - 5 = 6$$

$$\Rightarrow y = \frac{6}{2} = 3$$

∴ Speed of stream = 3 km/hr

=> Ans - (A)

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### Question 4

A boat travels 60 kilometers downstream and 20 kilometers upstream in 4 hours. The same boat travels 40 kilometers downstream and 40 kilometers upstream in 6 hours. What is the speed (in km/hr) of the stream?

A 24

B 16

C 18

D 20

**Answer: B**

**Explanation:**

Let speed of boat =  $x$  km/hr and speed of stream =  $y$  km/hr

Thus, downstream speed =  $(x + y)$  km/hr and upstream speed =  $(x - y)$  km/hr

Using, time = distance/speed

$$\Rightarrow \left(\frac{60}{x+y}\right) + \left(\frac{20}{x-y}\right) = 4$$

$$\Rightarrow \frac{15}{x+y} + \frac{5}{x-y} = 1 \text{ -----(i)}$$

Similarly,  $\left(\frac{40}{x+y}\right) + \left(\frac{40}{x-y}\right) = 6$

$$\Rightarrow \frac{1}{x+y} + \frac{1}{x-y} = \frac{3}{20} \text{ -----(ii)}$$

Solving equations (i) and (ii), we get :  $x = 24$  and  $y = 16$

$\therefore$  Speed of stream = **16 km/hr**

$\Rightarrow$  Ans - (B)

**Question 5**

A man rows 750 m in 675 seconds against the stream and returns in  $7\frac{1}{2}$  minutes. Its rowing speed in still water is (in km/hr).

A 5.5

B 5.75

C 5

D 5.25

**Answer: D**

**Explanation:**

$$\text{Boat's upstream speed}(S_u) = \frac{750}{675} = \frac{10}{9} \text{ m/sec}$$

$$\text{Boat's downstream speed}(S_d) = \frac{750}{450} = \frac{5}{3} \text{ m/sec}$$

$$\text{Boat's speed in still water} = \frac{1}{2} \times (S_u + (S_d))$$

$$= \frac{1}{2} \times \left(\frac{10}{9} + \frac{5}{3}\right)$$

$$= \frac{1}{2} \times \left(\frac{25}{9}\right)$$

$$= \frac{25}{18} \text{ m/sec}$$

Converting it into km/hr

$$= \frac{25}{18} \times \frac{18}{5} = 5 \text{ km/hr}$$

#### Question 6

If a boat goes a certain distance at 20 km/hr and comes back the same distance at 30 km/hr. What is the average speed (in km/hr) for the total journey?

- A 12
- B 24
- C 26
- D 25

**Answer:** B

**Explanation:**

$$\text{average speed} = \frac{2ab}{a+b} = \frac{2(20)(30)}{20+30} = 24$$

So the answer is option B.

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#### Question 7

A boat took 4 hours to travel 20km upstream. Find the speed of the boat in still water if the speed of the stream is 2 kmph ?

- A 5 kmph
- B 6 kmph
- C 7 kmph
- D 8 kmph

**Answer:** C

**Explanation:**

Let x be the speed of the boat in still water

During upstream, speed = x-2 kmph

Speed = Distance/time

$$x-2 = 20/4$$

$$x - 2 = 5$$

$$x = 7 \text{ kmph}$$

So the answer is option C.

### Question 8

A boat goes 8 km upstream and 12 km downstream in 7 hours. It goes 9 km upstream and 18 km downstream in 9 hours. What is the speed (in km/h) of the boat in still water?

A 5

B 4

C 2

D 3

**Answer: D**

### Explanation:

Let speed of boat in still water =  $x$  km/hr and speed of current =  $y$  km/hr

According to ques,

$$\Rightarrow \frac{12}{x+y} + \frac{8}{x-y} = 7 \text{ -----(i)}$$

$$\text{and } \frac{18}{x+y} + \frac{9}{x-y} = 9 \text{ -----(ii)}$$

Applying the operation :  $3 \times (i) - 2 \times (ii)$

$$\Rightarrow \frac{24}{x-y} - \frac{18}{x-y} = 21 - 18$$

$$\Rightarrow \frac{6}{x-y} = 3$$

$$\Rightarrow x - y = \frac{6}{3} = 2 \text{ -----(iii)}$$

$$\text{Substituting it in equation (i), } \Rightarrow \frac{12}{x+y} + \frac{8}{2} = 7$$

$$\Rightarrow \frac{12}{x+y} = 7 - 4 = 3$$

$$\Rightarrow x + y = \frac{12}{3} = 4 \text{ -----(iv)}$$

Now, adding equations (iii) and (iv), we get :

$$\Rightarrow 2x = 2 + 4 = 6$$

$$\Rightarrow x = \frac{6}{2} = 3$$

$\Rightarrow$  Ans - (D)

### Question 9

A boat covers 143 km upstream in 13 hours and the same distance downstream in 11 hours. What is the speed (in km/hr) of the boat in still water?

A 10

B 12

C 14

D 8

**Answer: B**

**Explanation:**

Let speed of the boat in still water =  $x$  km/hr and speed of current =  $y$  km/hr

According to ques,

$$\Rightarrow x - y = \frac{143}{13} = 11 \text{ -----(i)}$$

$$\text{and } x + y = \frac{143}{11} = 13 \text{ -----(ii)}$$

Adding both equations, we get :  $2x = 11 + 13 = 24$

$$\Rightarrow x = \frac{24}{2} = 12 \text{ km/hr}$$

$\Rightarrow$  Ans - (B)

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**Question 10**

A boat covers a distance of 14 km upstream and 16 km downstream in 9 hours. It covers a distance of 12 km upstream and 40 km downstream in 11 hours. What is the speed (in km/hr) of the boat in still water?

A 5

B 2

C 3

D 4

**Answer: A**

**Explanation:**

Let speed of boat in still water =  $x$  km/hr and speed of current =  $y$  km/hr

According to ques,

$$\Rightarrow \frac{16}{x+y} + \frac{14}{x-y} = 9 \text{ -----(i)}$$

$$\text{and } \frac{40}{x+y} + \frac{12}{x-y} = 11 \text{ -----(ii)}$$

Applying the operation :  $5 \times (i) - 2 \times (ii)$

$$\Rightarrow \frac{70}{x-y} - \frac{24}{x-y} = 45 - 22$$

$$\Rightarrow \frac{46}{x-y} = 23$$

$$\Rightarrow x - y = \frac{46}{23} = 2 \text{ -----(iii)}$$

Substituting it in equation (i),  $\Rightarrow \frac{16}{x+y} + \frac{14}{2} = 9$

$$\Rightarrow \frac{16}{x+y} = 9 - 7 = 2$$

$$\Rightarrow x + y = \frac{16}{2} = 8 \text{ -----(iv)}$$

Now, adding equations (iii) and (iv), we get :

$$\Rightarrow 2x = 2 + 8 = 10$$

$$\Rightarrow x = \frac{10}{2} = 5$$

$\Rightarrow$  Ans - (A)

### Question 11

Speed of a boat along and against the current are 14 kms/hr and 8 kms/hr respectively. The speed of the current is

- A 11 kms/hr
- B 6 kms/hr
- C 5.5 kms/hr
- D 3 kms/hr

**Answer:** D

### Explanation:

If Upstream speed =  $x$  km/hr and downstream speed =  $y$  km/hr

The, speed of boat =  $\frac{x+y}{2}$  km/hr and speed of current =  $\frac{y-x}{2}$  km/hr

According to ques, upstream speed ( $x$ ) = 8 km/hr

Downstream speed ( $y$ ) = 14 km/hr

$$\Rightarrow \text{Speed of current} = \frac{14-8}{2}$$

$$= \frac{6}{2} = 3 \text{ km/hr}$$

$\Rightarrow$  Ans - (D)

### Question 12

Speed of a boat is 8 km/hr in still water and the speed of the stream is 2 km/hr. If the boat takes 8 hours to go to a place and come back, then what is the distance (in km) of the place?

- A 24



B 30

C 45

D 42

Answer: B

**Explanation:**

Speed of boat in still water = 8 km/hr and speed of stream = 2 km/hr

Let distance covered =  $d$  km

According to ques,

$$\Rightarrow \frac{d}{(8-2)} + \frac{d}{(8+2)} = 8$$

$$\Rightarrow \frac{d}{6} + \frac{d}{10} = 8$$

$$\Rightarrow \frac{10d+6d}{60} = 8$$

$$\Rightarrow \frac{4d}{15} = 8$$

$$\Rightarrow d = \frac{15 \times 8}{4} = 30 \text{ km}$$

$\Rightarrow$  Ans - (B)

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**Question 13**

Speeds of a boat along the current and against the current are 14 km/hr and 7 km/hr respectively. What is the speed of boat (in km/hr) in still water?

A 3.5

B 7.5

C 10.5

D 9.5

Answer: C

**Explanation:**

Downstream speed of boat = 14 km/hr

Upstream speed of boat = 7 km/hr

$$\Rightarrow \text{Speed of boat (in km/hr) in still water} = \frac{1}{2} \times (14 + 7)$$

$$= \frac{21}{2} = 10.5 \text{ km/hr}$$

$\Rightarrow$  Ans - (C)

#### Question 14

Speeds of a boat along the current and against the current are 16 km/hr and 12 km/hr respectively. What is the speed (in km/hr) of the current?

- A 1
- B 2
- C 3
- D 4

**Answer:** B

#### **Explanation:**

Downstream speed of boat = 16 km/hr

Upstream speed of boat = 12 km/hr

$$\Rightarrow \text{Speed of current (in km/hr)} = \frac{1}{2} \times (16 - 12)$$

$$= \frac{4}{2} = 2 \text{ km/hr}$$

$\Rightarrow$  Ans - (B)

#### Question 15

A man can row 32 km upstream in 8 hours and the same distance downstream can be covered in 4 hours. If the speed of the stream and boat is constant throughout then what is the speed of stream?

- A 1 km/hr
- B 1.5 km/hr
- C 2 km/hr
- D 2.5 km/hr

**Answer:** C

#### **Explanation:**

We have been given that speed while travelling upstream is 4 km/hr and while rowing downstream it is 8 km/hr.

So if  $x$  is the speed of the boat and  $y$  is the speed of the stream then we have

$$x + y = 8$$

$$x - y = 4$$

$$\text{Hence, } 2x = 12 \Rightarrow x = 6$$

$$\Rightarrow y = 2$$

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### Question 16

A boat going upstream can cover a certain distance in 6 hours. The speed of the stream is half the speed of boat in still water. How much time will the boat take to cover the same distance downstream?

- A 3 hours
- B 2 hours
- C 1 hour
- D Cannot be determined

**Answer:** B

### Explanation:

Let the speed of the boat be  $2x$ . Hence, the speed of the stream will be ' $x$ '. Thus, net speed while going upstream =  $x$  and net speed while going downstream =  $3x$ . Hence, the time taken while travelling downstream will be one third of the time taken while going upstream. Thus, the correct answer will  $6/3 = 2$  hours

### Question 17

A boat goes 4 km upstream and 4 km downstream in 1 hour. The same boat goes 5 km downstream and 3 km upstream in 55 minutes. What is the speed (in km/hr) of boat in still water?

- A 6.5
- B 7.75
- C 9
- D 10.5

**Answer:** C

### Explanation:

Let speed of boat in still water =  $x$  km/hr and speed of current =  $y$  km/hr

The boat goes 4 km upstream and 4 km downstream in 1 hour

Using, time = distance/speed

$$\Rightarrow \frac{4}{x+y} + \frac{4}{x-y} = 1$$

$$\text{Similarly, } \frac{5}{x+y} + \frac{3}{x-y} = \frac{55}{60}$$

$$\text{Let } \frac{1}{x+y} = w \text{ and } \frac{1}{x-y} = z$$

$$\Rightarrow 4w + 4z = 1 \text{ and } 5w + 3z = \frac{55}{60}$$

Solving above equations, we get :  $w = \frac{1}{12}$  and  $z = \frac{1}{6}$

$$\Rightarrow x + y = 12 \text{ -----(i)}$$

$$\text{and } x - y = 6 \text{ -----(ii)}$$

Adding equations (i) and (ii),  $\Rightarrow 2x = 12 + 6 = 18$

$$\Rightarrow x = \frac{18}{2} = 9 \text{ km/hr}$$

$\Rightarrow$  Ans - (C)

### Question 18

A boat is sailing towards a lighthouse of height  $20\sqrt{3}$  m at a certain speed. The angle of elevation of the top of the lighthouse changes from  $30^\circ$  to  $60^\circ$  in 10 seconds. What is the time taken (in seconds) by the boat to reach the lighthouse from its initial position?

A 10

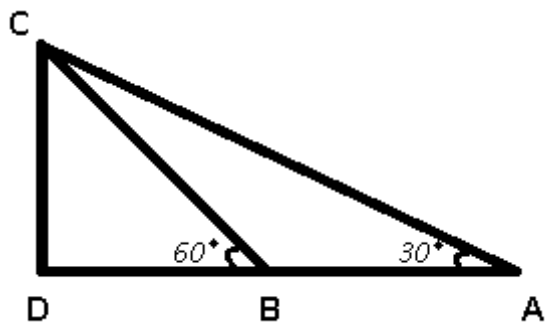
B 15

C 20

D 60

Answer: B

Explanation:



Given :  $CD = 20\sqrt{3}$  m and time taken to reach B from A = 10 seconds

To find : Time taken to reach D from A

Solution : In  $\triangle BCD$ ,

$$\Rightarrow \tan(60^\circ) = \frac{CD}{BD}$$

$$\Rightarrow \sqrt{3} = \frac{20\sqrt{3}}{BD}$$

$$\Rightarrow BD = 20 \text{ m}$$

Similarly, in  $\triangle ACD$ ,

$$\Rightarrow \tan(30^\circ) = \frac{CD}{AD}$$

$$\Rightarrow \frac{1}{\sqrt{3}} = \frac{20\sqrt{3}}{20+AB}$$

$$\Rightarrow AB + 20 = 60$$

$$\Rightarrow AB = 60 - 20 = 40 \text{ m}$$

$\Rightarrow$  Speed of boat (while travelling from A to B) = distance/time

$$= \frac{40}{10} = 4 \text{ m/s}$$

$$\Rightarrow AD = BD + AB = 20 + 40 = 60 \text{ m}$$

$\therefore$  Time taken to reach D from A =  $\frac{60}{4} = 15$  seconds

$\Rightarrow$  Ans - (B)

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### Question 19

If a boat goes a certain distance at 30 km/hr and comes back the same distance at 60 km/hr. What is the average speed (in km/hr) for the total journey?

- A 45
- B 50
- C 40
- D 35

**Answer:** C

#### Explanation:

$$\text{average speed} = \frac{2ab}{a+b} = \frac{2(30)(60)}{30+60} = 40$$

So the answer is option C.

### Question 20

The average weight of 15 oarsmen in a boat is increased by 1.6 kg when one of the crew, who weighs 42 kg is replaced by a new man. Find the weight of the new man (in kg).

- A 67
- B 65
- C 66
- D 43

**Answer:** C

**Explanation:**

Let the average weight of the original 15 oarsmen =  $A$

$$\Rightarrow \text{Total weight of 15 oarsmen} = 15A$$

Let the weight of new man be  $x$

After he replaces the man with weight 42 kg, the average weight increases by 1.6 kg

$$\Rightarrow \frac{15A + x - 42}{15} = A + 1.6$$

$$\Rightarrow 15A + x - 42 = 15A + 24$$

$$\Rightarrow x = 24 + 42 = 66$$

**Question 21**

If the speed of a boat in still water is 20 km/hr and the speed of the current is 5 km/hr, then the time taken by the boat to travel 100 km with the current is

A 2 hrs

B 3 hrs

C 4 hrs

D 7 hrs

**Answer: C**

**Explanation:**

Speed of boat = 20 km/hr and speed of current = 5 km/hr

Distance to travel = 100 km

Speed downstream (with the current) =  $20 + 5 = 25$  km/hr

$\Rightarrow$  Time taken = distance / speed

$$= \frac{100}{25} = 4 \text{ hours}$$

$\Rightarrow$  Ans - (C)

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**Question 22**

A boat goes 24 km upstream and 28 km downstream in 6 hours. It goes 30 km upstream and 21 km downstream in 6 hours and 30 minutes. The speed of the boat in still water is

A 8 km/hr

B 9 km/hr

C 12 km/hr

D 10 km/hr

**Answer: D**

**Explanation:**

Let speed of boat in still water =  $x$  km/h

and speed of stream =  $y$  km/h

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

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

Acc to ques :

$$\Rightarrow \frac{24}{x-y} + \frac{28}{x+y} = 6$$

$$\text{and } \frac{30}{x-y} + \frac{21}{x+y} = 6\frac{1}{2}$$

Solving above equations, we get :

$$x = 10 \text{ km/h and } y = 4 \text{ km/h}$$

**Question 23**

A boat can travel with a speed of 13 km/hr in still water. If the speed of stream is 4 km/hr in the same direction, time taken by boat to go 63 km in opposite direction is

A 9 hrs

B 4 hrs

C 7 hrs

D  $3\frac{9}{17}$  hrs

**Answer: C**

**Explanation:**

Speed of boat = 13 km/hr and speed of stream = 4 km/hr

When going in opposite direction i.e. upstream, relative speed =  $13-4 = 9$  km/hr

$$\begin{aligned} \Rightarrow \text{Time taken to go 63 km upstream} &= \frac{\text{distance}}{\text{speed}} \\ &= \frac{63}{9} = 7 \text{ hours} \end{aligned}$$

**Question 24**

A person can row a distance of one km upstream in ten minutes and downstream in four minutes. What is the speed of the stream ?

- A 4.5 km/h
- B 4 km/h
- C 9 km/h
- D 5.6 km/h

**Answer: A**

**Explanation:**

Distance(D) is given as 1 km

Let the speed of boat and river be B km/hr and R km/hr

in case of upstream , the speed of boat = (B-R) km/hr

in case of downstream, the speed of boat = (B+R) km/hr

in upstream it takes 10 minutes to move 1 km and takes 4 minutes in downstream for the same distance

So , using distance = speed x time

$$\frac{1}{B-R} = \frac{10}{60}$$

$$\frac{1}{B+R} = \frac{4}{60}$$

$$B-R = 6 \dots\dots(1)$$

$$B+R = 15 \dots\dots\dots(2)$$

Solving equations 1 and 2

$$B = 10.5 \text{ km/hr and } R = 4.5 \text{ Km/hr}$$

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### Question 25

Ravi rows a boat upstream in a river from point A to B in 4 hours. Had the river been still, he could have completed the journey in 3 hours. How much time will it take for Ravi to row the boat from point B to A?

- A 2 hour 24 minutes
- B 2 hours
- C 2 hour 48 minutes
- D 2 hour 12 minutes.

**Answer: A**

**Explanation:**



Let the distance between the 2 points A and B be D, the speed of Ravi be r and the speed of the stream be s.

$$D/(r-s) = 4$$

$$D = 4r - 4s \text{ -----(1)}$$

Had the water been still:

$$D/r = 3$$

$$D = 3r \text{ -----(2)}$$

Substituting (2) in (1), we get,

$$3r = 4r - 4s$$

$$r = 4s$$

While moving downstream, Ravi will travel at  $r + s = 4s + s = 5s$

Distance to be covered =  $3r = 3 \times 4s = 12s$

Time taken =  $12s/5s = 2.4$  hours = 2 hours 24 minutes.

Therefore, option A is the right answer.

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