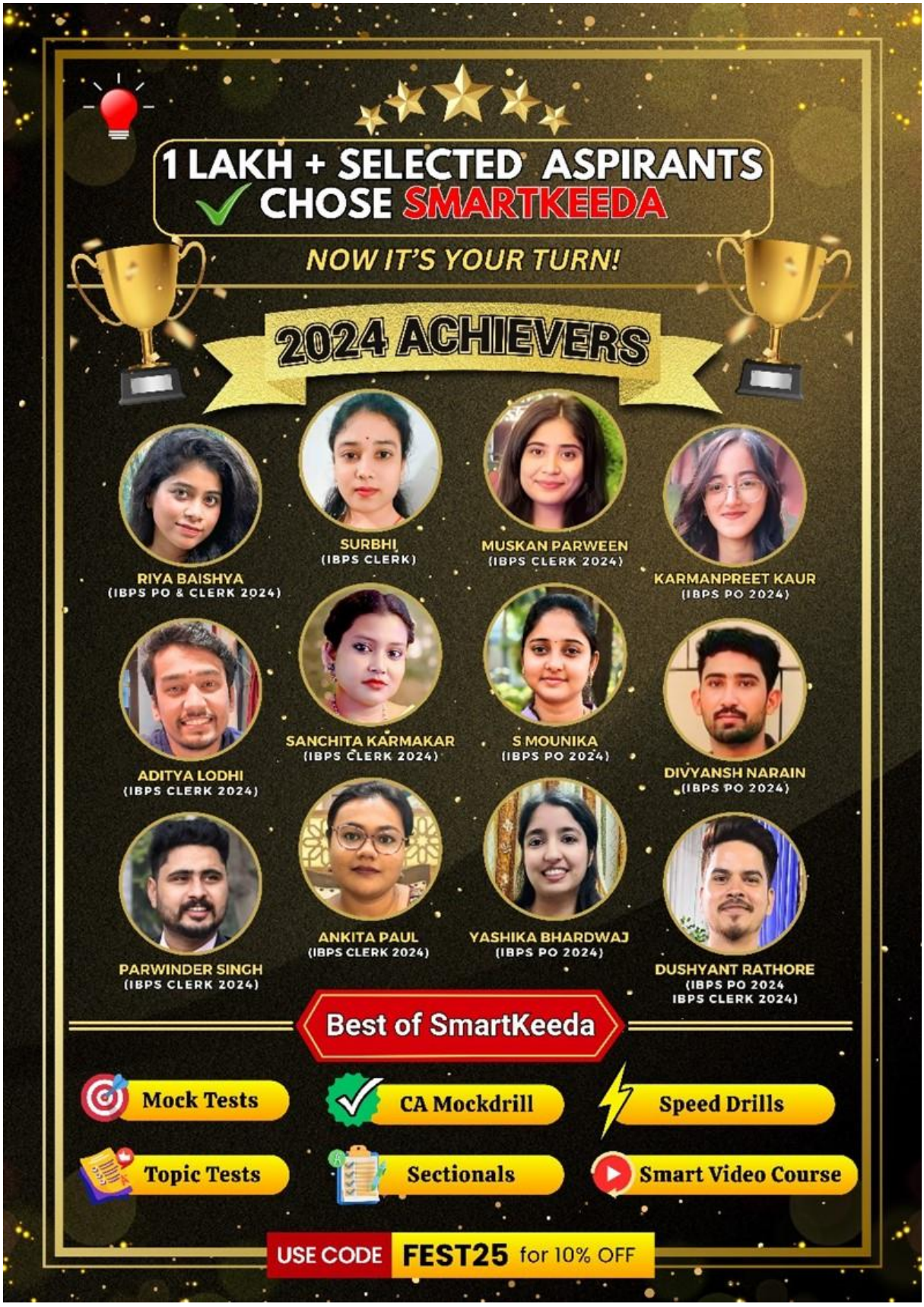
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Boat and Stream Questions for IBPS RRB Office Asst. Main, IBPS Clerk Mains and SBI Clerk Mains Exams.

B n S Quiz 7

Directions: Read the instructions carefully and answer the following questions.

1. **A boat can sail in still water at two different speeds; y kmph and (y+4) kmph. The boat goes downstream for first 10 km at y kmph and then for next 10 km at (y+4) kmph. The total time taken is 87.5 minutes. If the speed of the stream is y/2 kmph, find the value of y.**

   A. 2 B. 3 C. 4 D. 5 E. 8

2. **A boat sails downstream and reaches a point in river in 40 minutes. It then turns back and about to sail upstream to reach the starting point. The speed of stream is one fifth of the speed of the boat. By what percent the still water speed of the boat should be increased so that it takes 40 minutes to reach the starting point in upstream?**

   A. 15% B. 25% C. 40% D. 55% E. 65%

3. **The maximum still water speed of a boat is 20 kmph and the speed of stream is 4 kmph. It starts travelling upstream at its maximum still water speed, which decreases by 6 kmph after every 40 minutes. Find the distance the boat will cover before its speed becomes zero.**

   A. 16 km B. 18 km C. 20 km D. 24 km E. 32 km

4. **Two boats A and B are sailing in two different rivers namely P and Q. Ratio of upstream speeds of boat A to B in their respective river is 1 : 1. Find the ratio of difference between the still water speeds of boats A and B to the difference of stream speeds of rivers P and Q.**

   A. 1 : 1 B. 1 : 2 C. 2 : 1 D. 2 : 3 E. Can't be determined

5. **The time taken by a boat to travel a certain distance upstream is 44.44% more than the time taken by it to travel same distance downstream. If the speed of stream is 6 km/h, how much distance (in km) the boat will cover in 15 hours in still water?**

A. 465 B. 540 C. 365 D. 495 E. None of these

6. **Boat A and B start form the same point and go upstream and downstream respectively. The distance between them 6 hours later is 420 km and the ratio of speed of A and B during this journey was 3 : 4. If the speed of the current is 2 km/h, what will be the distance (in km) covered by A after travelling 5 hours downstream and 3 hours upstream?**

A. 252 B. 254 C. 236 D. 326 E. 260

7. **A man travels by a boat daily in a river from Point P to Point Q and comes back to Point P. One day he increases the speed (speed in still water) of the boat by 66.67% during the entire journey, because of which he takes 55.56% of his usual time. What is the ratio of the usual speed of the boat in still water to the speed of the stream of the river?**

(Given: Speed of the river remains unchanged.)

A. 2 : 1 B. 3 : 1 C. 4 : 1 D. 6 : 1 E. None of these

8. **A boat went 120 km downstream and came back in 14 hours. While coming back, at a distance of 30 km from the starting point, it meets a log that had crossed the starting point exactly at the same time the boat had started its journey downstream. What is the speed of the boat in still water?**

A. 10 B. 12.50 C. 15 D. 17.50 E. None of these

9. **A man can row 6 km/hr in still water. The speed of the stream is 1 meter/second. He travels from X to Y and comes back to X in 30 minutes. What is the distance between X and Y?**

A. 96 meters B. 960 meters C. 9.6 km D. 96 km E. None of these

10. **Boat A starts rowing downstream and Boat B starts rowing upstream from the same place in a river at the same time. After 40 minutes, when they are at a distance of 12 km from each other, B turns back and starts to chase A. After 2 hour 40 minutes from the time they start, the two of them together have rowed for a total distance of 60 km. What is the speed of the current?**

A. 3 km/hr B. 4 km/hr C. 5 km/hr D. 6 km/hr E. Can't be determined

Correct Answers:

1	2	3	4	5	6	7	8	9	10
E	C	C	A	D	E	B	D	B	A

Explanation:

1. We have

$$\frac{10}{(y + y/2)} + \frac{10}{(y + 4 + y/2)} = \frac{87.5}{60} = \frac{35}{24}$$

$$\frac{20}{3y} + \frac{20}{(3y + 8)} = \frac{35}{24}$$

Putting each value given in the options one by one, we find that y = 8 fits the equation.

Hence, option E is correct.

2. Let the speed of the boat and stream be 5b kmph and b kmph respectively, and the distance between the starting and final points is y km, then we have

$$\frac{y}{5b + b} = \frac{40}{60} = \frac{2}{3} \text{ hours}$$

$$\frac{y}{6b} = \frac{2}{3} \text{ hours -----(i)}$$

Now, let it increases the speed by R%, then the new speed

$$= (1 + \frac{R}{100})\ 5b \text{ kmph}$$

Time to reach starting point is again 40 minutes, so

$$\frac{y}{((1 + R/100)5b - b)} = \frac{40}{60} = \frac{2}{3} \text{ hours ----(ii)}$$

From (i) and (ii), we get

$$\frac{y}{((1 + R/100)5b - b)} = \frac{y}{6b}$$

$$(1 + \frac{R}{100})^{5} - 1 = 6$$

$(1 + \frac{R}{100}) = \frac{7}{5}$

$\frac{R}{100} = 0.4$

R = 40%

Hence, option C is correct.

3. Its still water speed changes from 20 kmph to 14 kmph to 8 kmph and so on.

Since it is moving upstream, we would subtract the stream speed from still water speed.

Distance covered in first 40 minutes = $(20 - 4) \times \frac{40}{60}$

Distance covered in next 40 minutes = $(14 - 4) \times \frac{40}{60}$

Distance covered in last 40 minutes = $(8 - 4) \times \frac{40}{60}$

After the last 40 minutes, the speed will eventually be zero and then negative.

Total distance = $\frac{40}{60} \times (16 + 10 + 4) = 20$ km

Hence, option C is correct.

4. Let the still water speeds of the boats A and B is 'a' and 'b' kmph respectively, and the stream speed of the rivers P and Q is 'p' and 'q' kmph respectively.

Then, we have

$\frac{(a - p)}{(b - q)} = \frac{1}{1} \rightarrow a - p = b - q \rightarrow a - b$

$= p - q \rightarrow \frac{(a - b)}{(p - q)} = \frac{1}{1}$

So, the ratio is again 1 : 1

Hence, option A is correct.

5. Let the speed of boat be b and that of current be c

As we know that, 44.44%=4/9

So,

$$\frac{\text{T up}}{\text{T down}} = 1 + \frac{4}{9} = \frac{13}{9}$$

$$\frac{\text{Speed down}}{\text{Speed up}} = \frac{13}{9}$$

$$\frac{(b + c)}{(b - c)} = \frac{13}{9}$$

$$\frac{b}{c} = \frac{11}{2}$$

as, c = 6, therefore b = 33 km/h

Required distance = 33 × 15 = 495 km

Hence, option D is correct.

6.

Ratio of upstream speed of A : downstream speed of B = 3 : 4

Let the speeds be 3k and 4k

Relative speeds = 7k

7k × 6 = 420 → k = 10

Upstream speed of A = 30 km/h

Stream speed = 2 km/h

Still water speed of A = 32 km/h

Required distance = (32 + 2) × 5 + (32 – 2) × 3 = 260 km

Hence, option E is correct.

7.

$$66.67\% \text{ increase} = \frac{2}{3}\text{increase} = \frac{5}{3}$$

$$55.56\% = \frac{5}{9}$$

Let the usual speed of the boat in still water = 3B

New speed of the boat in still water = 5B

Speed of the stream = S

$$\frac{\frac{PQ}{(3B+S)}+\frac{PQ}{(3B-S)}}{\frac{PQ}{(5B+S)}+\frac{PQ}{(5B-S)}}=\frac{9}{5}$$

$$\frac{\frac{1}{(3B+S)}+\frac{1}{(3B-S)}}{\frac{1}{(5B+S)}+\frac{1}{(5B-S)}}=\frac{9}{5}$$

$$\frac{\frac{(3B-S+3B+S)}{(9B^2-S^2)}}{\frac{(5B-S+5B+S)}{(25B^2-S^2)}}=\frac{9}{5}$$

$$\frac{\frac{6B}{(9B^2-S^2)}}{\frac{10B}{(25B^2-S^2)}}=\frac{9}{5}$$

$25B^2 – S^2 = 27B^2 – 3S^2$

S : B = 1 : 1

Speed of boat in still water : Speed of the stream = 3B : S

So the answer = 3 × 1 : 1 = 3 : 1

Hence, Option B is correct.

8. Time → The boat travels 120 km downstream = The boat travels (120 – 30 = 90 km) upstream

Speeds → Downstream : Upstream = 120 : 90 = 4 : 3

Let,

Downstream speed = 4 units

Upstream speed = 3 units

$$\text{Speed of stream} = \frac{4-3}{2} = 0.50$$

Total time → Downstream : Upstream = 3 : 4

$$\text{Time} \rightarrow \text{Downstream} = \frac{14 \times 3}{3+4} = 6 \text{ hours}$$

$$\text{Downstream speed} = \frac{120}{6} = 20 \text{ km/hr}$$

Speed of the boat in still water

$$= 20 \times \frac{4-0.50}{4} = 17.50 \text{ km/hr}$$

Directions for : Time → The boat travels 120 km downstream = The boat travels (120 – 30 = 90 km) upstream

If we take,

Speed of the boat in still water = B km/hr

Speed of the stream = S km/hr

Upstream speed = (B – S) km/hr

Downstream speed = (B + S) km/hr

When the boat was going downstream, the gap between the boat and the log was increasing at = (B + S) – S = B km/hr

When the boat was going upstream, the gap between the boat and the log was decreasing at = (B – S) + S = B km/hr

If the boat takes U turn after 't' hours from the start, the distance between boat and log will be 'Bt' and the time taken to cover this distance in upstream = Bt/B = t hours

It means the boat travels for the same time in both directions till it meets the log.

So Downstream speed : Upstream speed = 120 : (120 – 90) = 4 : 3

Hence, Option D is correct.

9.

Speed of stream = $\frac{1 \times 18}{5} = \frac{18}{5}$

$(\frac{XY}{(6 + 3.60)}) + (\frac{XY}{(6 – 3.60)}) = \frac{30}{60}$

$(\frac{XY}{9.60})+(\frac{XY}{2.40}) = \frac{1}{2}$

$(\frac{XY}{9.60})+(\frac{4XY}{9.60}) = \frac{1}{2}$

$\frac{5XY}{9.60} = \frac{1}{2}$

$XY = \frac{9.60}{10} = 0.96$ km = 960 meters

Hence, Option B is correct.

10.

In 40 minutes the combined distance covered = 12 km

In 1 hour it will be = $\frac{12 \times 60}{40}$ = 18 km

In 1 hour → (A + stream) + (B – stream) = 18 km/hr —— Case 1

In next 2 hours, when both of them are going downstream the combined distance covered = 60 – 12 = 48 km

In 1 hour = $\frac{48}{2}$ = 24 km

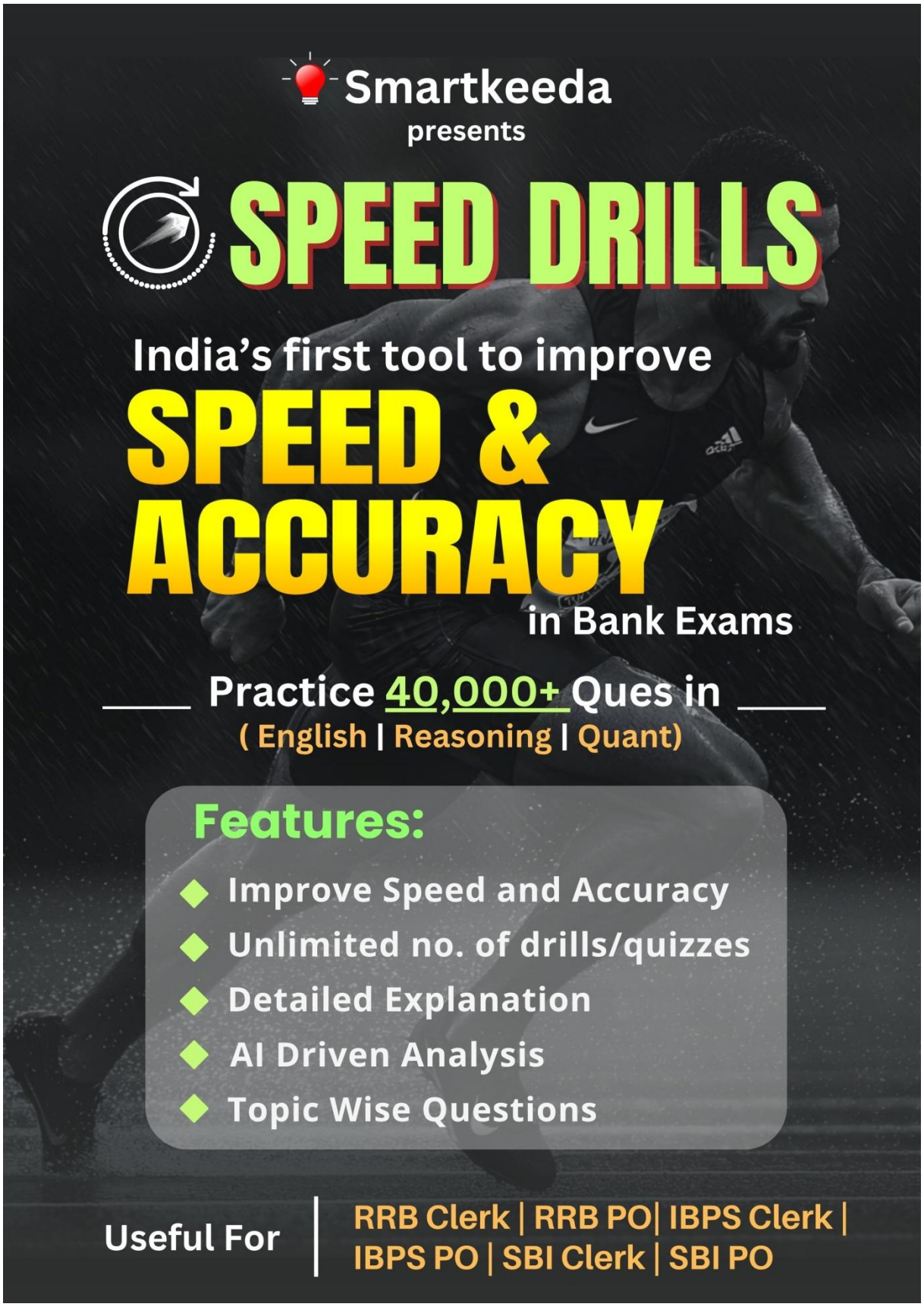
(A + stream) + (B + stream) = 24 km/hr ——— Case 2

Now, Case 2 – Case 1

2 × speed of the stream = 6 km/hr

So the answer = $\frac{6}{2}$ = 3 km/hr

Hence, Option A is correct.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