BANK PROBATIONARY OFFICER
QUANTITATIVE APTITUDE

BOAT AND STREAMS

Important Formulae:

1. If the speed of a boat in still water be x km/hr and that of stream be y km/hr

   a) Speed of the boat downstream
   = (x+y) km/hr

   b) Speed of the boat upstream
   = (x-y) km/hr

2. If the speed of a boat downstream is u km/hr and speed upstream is v km/hr

   a) Speed of the boat in still water
   $= \frac{1}{2}(u+v)$ km/hr

   b) Speed of the current
   $= \frac{1}{2}(u-v)$ km/hr

3. If a man rows in still water at x km/hr and the rate of current (or stream) is y km/hr,

   a) Man's rate with the current
   = (x+y) km/hr

   b) Man's rate against the current
   = (x-y) km/hr

Solved Examples

1. A man can row upstreams at 6 km/hr and down streams at 11 km/hr. Find man's rate in still water and the rate of the current.

Ans: Rate in still water $= \frac{1}{2}(6+11) = 8.5$ km/hr.

Rate of current $= \frac{1}{2}(11-6) = 2.5$ km/hr.

2. A man can row 9 km/hr in still water. It takes him twice as long to row up as to row down the river. Find the rate of stream.

Ans: Let man's rate in upstream = x km/hr.
man's rate downstream = 2x km/hr.

$\therefore$ Man's rate in still water $= \frac{1}{2}(x+2x)$ km/hr.

ie, $\frac{3x}{2} = 6 \Rightarrow x = 4$

$\therefore$ Rate upstream = 4 km/hr.
& Rate downstream = 8 km/hr.

$\therefore$ Rate of current = $\frac{1}{2}$ (8-4) km/hr.
= 2 km/hr.

3. A boatman can row 3 km against the stream in 45 minutes and return in 30 minutes. Find the rate of his rowing in still water and also the speed of the stream.

Ans: Let the speed of the boatman in still water be x km/hr and the speed of the stream be y km/hr.

Time taken to row against the stream
$= \frac{45}{60} = \frac{3}{4}$ hr.

Time taken to row with the stream
$= \frac{30}{60} = \frac{1}{2}$ hr.

Speed against current = x-y = $\frac{\text{Distance}}{\text{Time}}$

$= \frac{3}{3/4}$ = 4 km/hr.

Speed with current = x+y = $\frac{\text{Distance}}{\text{Time}}$

$= \frac{3}{1/2}$ = 6 km / hr

$\therefore x+y = 6$ & $x-y = 4$

$\Rightarrow x=5$ km/hr. & $y = 1$ km/hr

PRACTICE TEST

1. A person can row down stream at 12 kmph. and upstream in 6 kmph. Then, the persons' rate in still water is:

1) 9 kmph 2) 5 kmph

3) 12 kmph 4) 6 kmph

2. If a person's rate down the current is 11 km/hr. and the rate of the current is 3 km/hr., then the person's rate against the current (in km/hr.) is

1) 7 kmph 2) 8 kmph

3) 5 kmph 4) 6 kmph

3. A person can row upstream 12 km/hr. and down stream at 18 km/hr. Then, the rate of the current is

1) 14 kmph 2) 20 kmph

3) 17 kmph 4) 3 kmph

4. The downstream speed of a boat is 15 kmph. and the speed of the stream is 2 kmph. Then the upstream speed of the boat is

1) 6.5 kmph 2) 13 kmph

3) 11 kmph 4) 12 kmph

5. The speed of a boat in still water is 16 kmph. and the rate of the current is 2 kmph. The distance travelled down stream in 15 minutes is:

1) 4 km 2) 4.5 km

3) 6 km 4) 8.5 km

6. A man can row 6 kmph. in still water. If the river is running at 2 kmph, it takes him 3 hours to row to a place and back. Then the distance of the place is

1) 2 km. 2) 1.5 km

3) 3 km 4) 4.5 km

7. A boat takes 9 hrs to travel from A to B upstream. If the river current is 3 km/hr, how long will it take to travel downstream between B and A?

1) 3 hrs 2) 6 hrs

3) 4.5 hrs 4) 5 hrs

8. A boat goes 11 km in an hour with the stream and 5 km in an hour against the stream. The speed of the boat (in km/hr.) in still water is

1) 5 2) 6 3) 8 4) 9

9. A man rows upstream 13 km and down stream 28 km taking 5 hrs each time. The velocity of the current in km/hr. is

1) 0.5 2) 1 3) 1.5 4) 2

10. A boat moves down stream at the rate of 1 km in 7.5 mts and upstream at the rate of 5 km/hr. The speed of the boat (in km/hr.) in still water is

1) 6 2) 6.5 3) 7 4) 7.5

11. A boat can be rowed 9 km upstream or 18 km downstream in a period of 3 hrs. What is the speed of the boat in still water in kmph?

1) 1.5 2) 3 3) 4.5 4) 6

12. A boatman can row to a place 48 km distant and back, in 14 hrs. If he can row 4 km with the stream in the same time as 3 km against it, the speed of the stream (in km/hr) is

1) 1 2) 2.2 3) 3 4) 0.5

ANSWERS TO PRACTICE TEST

1. (1) 2. (3) 3. (4) 4. (3) 5. (2) 6. (1) 7. (4) 8.(3)

9. (3) 10. (2) 11. (3) 12. (1)