Quiz Date: 11ᵗʰ July 2020

Q1. Time taken by a boat to cover (D-15) km in upstream is 3 times of the time taken by boat to cover (D-5) km in downstream. If ratio of speed of the boat in still water to speed of boat in downstream is 5 : 8 and boat can cover (D-21) km in downstream in 3 hours, then, find speed of boat in still water?
(a) 6 kmph
(b) 4 kmph
(c) 8 kmph
(d) 5 kmph
(e) 7 kmph

Q2. A boat has to travel upstream 20 km distance from point X of a river to point Y. The total time taken by boat in travelling from point X to Y and Y to X is 41 min 40 s. What is the speed of the boat?
(a) 66 kmph
(b) 72 kmph
(c) 48 kmph
(d) Cannot be determined
(e) None of these

Q3. A certain passenger train travels at the rate of 42 km/hr, and a goods train whose length is half of the passenger train, travels at 33 km/hr. When the two are travelling in the same direction it takes 50 seconds to cross each other. How long does it take the two trains to pass each other when they are travelling in opposite directions?
(a) 6 sec
(b) 18 sec
(c) 21 sec
(d) 12 sec
(e) 18 sec

Q4. A man can row at a speed of 4.5 km/hr in still water to a certain upstream point and back to the starting point in a river which flows at 1.5 km/hr. Find his average speed for total journey.
(a) 4 km/hr
(b) 6 km/hr
(c) 4.5 km/hr
(d) 5 km/hr
(e) None of these

Q5. Ratio between length of two trains is 1 : 2 and speed of two trains is 120 km/hr & 108 km/hr respectively and both trains running in same direction cross each other in 108 sec. If two compartments were added in smaller train then it can cross a platform of length of 12.5 times of length of one compartment in 14.04 sec, then find the time taken by longer train to cross that same platform, if five new compartments were added in to that train?

(a) 18 sec
(b) 22 sec
(c) 16 sec
(d) 20 sec
(e) 28 sec

Directions (6-7): A boat 'A' start from point X, toward point Y in upstream simultaneously second boat 'B' start from point Y to X having speed more than first boat 'A'. Difference between speed of both boats in still water is equal to the speed of stream and they cross each other first time after 2 hours. Given that both boats start their respective return journey by reaching their destination points.

Q6. If distance between X and Y is 56 km and speed of stream is 4 km/hr then find the distance from 'Y' when boats cross each other 1st time.
(a) 44 km
(b) 36 km
(c) 32 km
(d) 40 km
(e) None of these
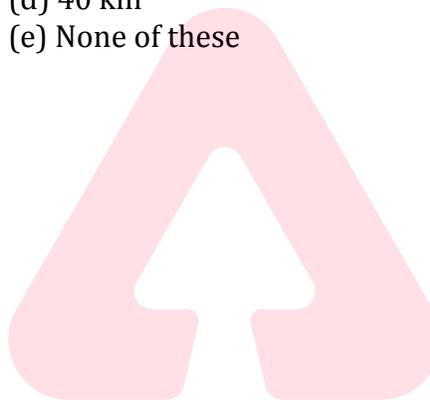
Q7. Find the time taken by boats to cross each other on 2nd time from the first time if speed of second boat 'B' is 1.5 times of the speed of first boat 'A' in still water?
(a) 5 hours
(b) 3 hours
(c) 2 hours
(d) 6 hours
(e) 4 hours

Q8. A train travelling at 144 km/hr crosses another train, having 30 meter less length and travelling in opposite direction at 126 km/hr in 6 seconds. If longer train cross a railway platform in 20 second then find smaller train will cross same platform in how many seconds?
(a) 22 seconds
(b) 24 seconds
(c) 28 seconds
(d) 32 seconds
(e) 30 seconds

Q9. A train 75 meters long overtake a person who walking at the speed of 6 km/hr in opposite direction and passed him in 7 ½ sec subsequently, it overtake a second person, walking in same direction as the first person and passed him in 6 ¾ S. then find speed of second person ?
(a) 15 km/hr
(b) 10 km/hr
(c) 18 km/hr
(d) 20 km/hr
(e) 8 km/hr

Q10. A boat goes 24 km upstream and 28 km downstream in 6 hrs. and also goes 30 km upstream and 21 km downstream in 6 hr and 30 minutes. The speed of boat in still water is ?
(a)8 km/hr
(b)10 km/hr
(c)6 km/hr
(d)7.5 km/hr
(e)12 km/hr

Direction (11-15): What should come in place of question mark (?) in the following number series?
Q11. 262, 234, 206, 178, 150, 122, ?
(a) 76
(b) 78
(c) 84
(d) 89
(e) 94

Q12. 4762, 4627, 4494, 4363, 4234, ?
(a) 4147
(b) 4137
(c) 4127
(d) 4117
(e) 4107

Q13. 672, 560, 448, 336, 224, ?
(a) 172
(b) 142
(c) 132
(d) 112
(e) 102

Q14. 18, 97, 396, 1197, 2404, ?
(a) 2816
(b) 3215

(c)3612
(d) 2415
(e) 3600

Q15. 2, 26, 144, 590, 1164, ?
(a) 1864
(b) 1732
(c) 1460
(d) 1296
(e) 1182

Solutions

S1. Ans (d)
Sol. let speed of boat in still water and speed of current be x kmph and y kmph respectively.
ATQ
$\frac{x}{x+y} = \frac{5}{8}$
$\frac{x}{y} = \frac{5}{3}$
Let x=5p and y=3p
$\frac{D-21}{5p+3p} = 3$
$D - 21 = 24p \dots (i)$
Now, $\frac{D-15}{2p} = 3 \times \frac{D-5}{8p}$
$D = 45\ km$
From (i)
$p = \frac{24}{24} = 1$
So, speed of boat in still water $= 5\ kmph$

S2. Ans.(d)
Sol. Let speed of boat in still water = v kmph
Speed of stream = s kmph
$\therefore \frac{20}{v-s} + \frac{20}{v+s} = \frac{25}{36}$
Here, we cannot find the required answer as there are two variables in one equation.

S3. Ans (a)
Sol. Let the length of passenger train is l
Length of goods train is $l + \frac{l}{2}$
$\left(\ell + \frac{\ell}{2}\right) = 50 \times (42 - 33) \times \frac{5}{18}$
$\frac{3\ell}{2} = 125$
$\ell = \frac{250}{3}$ meter
time required to cross the train when they are travelling in opposite direction
$= \frac{\left(\ell + \frac{\ell}{2}\right)}{(42 + 33) \times \frac{5}{18}} = \frac{\frac{3\ell}{2}}{75 \times \frac{5}{18}}$
$= \frac{\frac{3}{2} \times \frac{250}{3}}{75 \times \frac{5}{18}} = 6$ sec.

S4. Ans.(a)
Sol.
Let v and s be speed of boat in still water and speed of stream respectively.
$v = 4.5$ km/hr
$s = 1.5$ km/hr
Average speed $= \frac{(v+s)(v-s)}{v}$
$= \frac{(4.5 + 1.5)(4.5 - 1.5)}{4.5}$
$= \frac{6 \times 3}{4.5}$
$= 4$ km/hr

S5. Ans(b)
Sol.
Let length of two train is l & 2l respectively
ATQ –
$(120 - 108) \times \frac{5}{18} = \frac{l + 2l}{108}$
$\frac{10}{3} = \frac{l}{36}$
l = 120 m
Length of longer train = $2 \times 120 = 240 \, m$
Let length of each compartment be x m
So,
$120 \times \frac{5}{18} = \frac{120 + 2 \times x + 12.5 \times x}{10.04}$
$\frac{100}{3} = \frac{120 + 14.5x}{14.04}$
1404 = 360 + 43.5x
43.5 = 1044
x = 24 m
Length of platform = $24 \times 12.5 = 300$ m
New length of longer train = $240 + 5 \times 24 = 360 \, m$
Let time taken by longer train = t sec

$$108 \times \frac{5}{18} = \frac{360+300}{t}$$

t = $\frac{660}{30}$

t = 22 sec

S6. Ans.(d)
Sol.
Given XY = 56 = $4a + 2b$
$2a + b$ = 28
Now speed of stream = b = 4 km/hr
$2a + 4$ = 28
a = 12 km/hr
Speed of first boat 'A' in still water = 12 km/hr
Speed of 2nd boat 'B' in still water = 16 km/hr
Distance travelled by boat A till 1st crossing = $20 \times 2 = 40 \, km$
Required distance from Y = 40 km

S7. Ans.(b)
Sol.
If speed of first boat 'A' = a km/hr
Speed of second boat 'B' $\Rightarrow \frac{3}{2} a$ km/hr
So speed of stream $\Rightarrow \frac{3}{2} a - a = \frac{a}{2}$ km/hr
Distance travelled by first boat till first crossing
$\Rightarrow \left(a - \frac{a}{2}\right) \times 2$
$\Rightarrow a$ km
Speed of first boat in upstream = $\frac{a}{2}$ km/hr
Speed of 2nd boat in downstream = $2a$ km/hr

X $\leftarrow$ a $\rightarrow$ $\leftarrow$ 4a $\rightarrow$ Y

2nd boat reached at X $\Rightarrow \frac{a}{2a} = \frac{1}{2} h$
In $\frac{1}{2}$ hour first boat cover $\Rightarrow \frac{1}{2} \times \frac{a}{2} = \frac{a}{4}$ km
Distance between both boats $\Rightarrow a + \frac{a}{4}$
$\Rightarrow \frac{5a}{4}$ km
Relative speed of boat 'A' and 'B' when they cross each other

$= \left(\frac{3a}{2} - \frac{a}{2} - \frac{a}{2}\right) = \frac{a}{2}$ km/hr

Time taken to cross $\frac{5a}{4}$ km

$\Rightarrow \frac{5a \times 2}{4 \times a} = 2.5$ hour

So total time for 2nd crossing

$\Rightarrow$ 2.5 + 0.5

= 3 hours

S8. Ans(a)
Sol.
Let length of both trains be L meters and (L – 30) meters respectively
ATQ,
$(144 + 126) \times \frac{5}{18} = \frac{L + (L - 30)}{6}$
450 = 2L – 30
L = 240
Smaller train length = 210 meters
Let length of platform be P meters
ATQ,
$144 \times \frac{5}{18} = \frac{240 + P}{20}$
P = 800 – 240 = 560 meters
Let required time = T
ATQ,
$126 \times \frac{5}{18} = \frac{210 + 560}{T}$
$T = \frac{770}{35}$
T = 22 sec

S9. Ans.(b)
Sol.
Case I –
Relative speed $= \frac{75}{\frac{15}{2}} = 10 \, \text{m/s}$
$= 10 \times \frac{18}{5} = 36 \, \text{km/hr}$
Speed of train = 36 – 6 = 30 km/hr
Case II–
Relative speed $= \frac{75}{\frac{27}{4}} = 100 \, \text{m/s}$
$= \frac{100}{9} \times \frac{18}{5} = 40 \, \text{km/hr}$
Speed of second person = 40 – 30 = 10 km/hr

S10. Ans.(b)
Sol.
Let x km/hr be speed of boat in still water and y km/hr is speed of current.
Downstream = (x + y) km/hr

Upstream speed = (x – y) km/hr

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

$\frac{21}{x+y} + \frac{30}{x-y} = \frac{13}{2}$

$\frac{84}{x+y} + \frac{72}{x-y} = 18$ ... (i)

$\frac{84}{x+y} + \frac{120}{x-y} = 26$ ... (ii)

$\frac{-48}{x-y} = -8 \Rightarrow x - y = 6$

$\therefore$ equation (i)

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

x + y = 14

x = 10 km/hr

y = 4 km/hr

S11. Ans (e)
Sol. –28, –28, –28, ………….
$\therefore$ 122 – 28 = 94

S12. Ans (e)
Sol. $-135, -133, -131, -129, -127$
$\therefore 4234 - 127 = 4107$

S13. Ans (d)
Sol. $-112, -112, -112, -112, ...$
$\therefore 224 - 112 = 112$

S14. Ans (d)
Sol. $(\times 5 + 7), (\times 4 + 8), (\times 3 + 9), (\times 2 + 10)$
$\therefore 2404 \times 1 + 11 = 2415$

S15. Ans (e)
Sol. $2 \times 8 + 10 = 26$
$26 \times 6 - 12 = 144$
$144 \times 4 + 14 = 590$
$590 \times 2 - 16 = 1164$
$1164 \times 1 + 18 = 1182$