

Quiz Date: 24<sup>th</sup> March 2020

Q1. Ratio between length of two trains X & Y is 3 : 4 and both the trains are running at the speed of 81 km/hr and 108 km/hr respectively. If both the trains are running in opposite direction, they crossed each other in 8 sec, then find in what time both trains will cross each other when running in same direction?

- (a) 48 sec
- (b) 56 sec
- (c) 44 sec
- (d) 42 sec
- (e) 40 sec

Q2. A train travelling at 72 km/hr crosses another train, having three fifth of its length and travelling in opposite direction at 45 km/hr in  $32\frac{5}{5}$  seconds. It also passed a railway platform in 16 seconds. The length of the rail platform is

- (a) 150 m
- (b) 200 m
- (c) 190 m
- (d) 160 m
- (e) 180 m

Q3. Gorakhdham express and Lichhavi express are running in opposite direction with the speeds of 72 km/hr and 84 km/hr respectively, If Gorakhdham express and Lichhavi express passed Intercity express, which are at rest having length 240 meters in 26 sec and 24 sec respectively. Find in what time Lichhavi express will pass Gorakhdham express, if both running in same direction?

- (a) 144 sec
- (b) 120 sec
- (c) 108 sec
- (d) 100 sec
- (e) 180 sec

Q4. A train 75 metres long overtook a person who was walking at the rate of 6 km an hour in the same direction and passed him in  $7\frac{1}{2}$  seconds. Subsequently it overtook a second person walking in same direction and passed him in  $6\frac{3}{4}$  seconds. At what rate was the second person travelling?

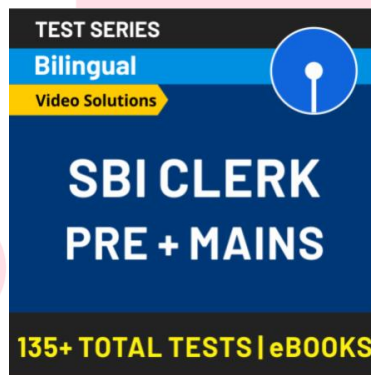
- (a) 1 km/hr
- (b) 2 km/hr
- (c) 3 km/hr
- (d) 4 km/hr
- (e) 2.5 km/hr

Q5. A train leaves the station  $\frac{1}{2}$  hour before the scheduled time. The driver decreases its speed by 25 km/hr. At the next station 250 km away, the train reached on time. Find the original speed of the train.

- (a) 100 km/hr
- (b) 125 km/hr
- (c) 200 km/hr
- (d) 180 km/hr
- (e) 175 km/hr

Q6. A train P, 180 meter long passed a pole in  $\frac{27}{4}$  sec and also passed two trains Q and R in 9 sec and 39 sec respectively, where train Q running in opposite direction of train P and train R is running in same direction of train P. If length of train Q and R is 240 meter and 210 meter respectively, then in what time train Q will pass train R, if both runs in opposite direction ?

- (a) 35 sec
- (b)  $9\frac{7}{11}$  sec
- (c)  $12\frac{3}{11}$  sec
- (d) 15 sec
- (e) 55 sec



Q7. A boat cover 60 km upstream and 60 km downstream in 22.5 hr with its usual speed. If boat double its speed then new upstream speed is 150% more than the usual upstream speed. Find the time taken by boat to cover 80 km in downstream with usual speed.

- (a) 12 hr
- (b) 20 hr
- (c) 5 hr
- (d) 16 hr
- (e) 10 hr

Q8. Speed of train 'Y' is 100% more than speed of train 'X'. Length of train 'Y' is 150% of the length of train 'X'. If train 'X' can cross a pole in 2 seconds, then find in how much time train 'Y' can cross train 'X' when they travel in same direction?

- (a) 4 seconds
- (b) 5 seconds
- (c) 6 seconds
- (d) 8 seconds

(e) 10 seconds

Q9. A train starts from Delhi for Jammu at 8:00 A.M. Another train starts from Ludhiana Junction at 9:00 A.M for Jammu. If the distance between Delhi and Jammu is 480 km and distance between Delhi and Ludhiana is 160 km and both trains reach Jammu at same time, then find speed of second train. It is given that first train covers  $\frac{1}{6}$ th of total distance between Delhi and Jammu in first hour. While going to Jammu, first train passes through Ludhiana.

- (a) 48 km/h
- (b) 64 km/h
- (c) 84 km/h
- (d) 54 km/h
- (e) 68 km/h

Q10. Speed of a boat in still water is 120% of its upstream speed in a river. After covering 105 km downstream it returns and covers  $28\frac{4}{7}$ % of distance covered in downstream. If time taken in downstream is 3 hours more than time taken in return trip then find the normal speed of current.

- (a) 2 km/hr
- (b) 2.5 km/hr
- (c) 3 km/hr
- (d) 4 km/hr
- (e) 3.5 km/hr

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**Solutions**

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S1. Ans.(b)

Sol.

Let length of train X & Y be 3L meter and 4L meter respectively.

A/Q,

$$(81 + 108) \times \frac{5}{18} = \frac{3L+4L}{8}$$

$$52.5 \times 8 = 7L$$

$$L = 60 \text{ meter}$$

Length of train X = 180 meters

Length of train Y = 240 meters

Let, when trains are running in same direction cross each other in T sec

$$(108 - 81) \times \frac{5}{18} = \frac{180+240}{T}$$

$$7.5 T = 420$$

$$T = 56 \text{ sec}$$

S2. Ans.(c)

Sol.

Let length of first train is x metre.

$$\frac{\left(x + \frac{3x}{5}\right)}{20 + \frac{25}{2}} = \frac{32}{5}$$

$$\frac{16x}{325} = \frac{32}{5}$$

$$x = 130m$$

$$\begin{aligned} \therefore \text{Length of platform} &= 16 \times 20 - 130 \\ &= 320 - 130 = 190m \end{aligned}$$



S3. Ans.(e)

Sol.

Let length of Gorakhdham express is  $L_G$  meters and length of Lichhavi express is  $L_M$  meters

For Gorakhdham express —

$$72 \times \frac{5}{18} = \frac{L_G + 240}{26}$$

$$L_G = 520 - 240$$

$$L_G = 280 \text{ meters}$$

Same for Lichhavi express

$$84 \times \frac{5}{18} = \frac{L_M + 240}{24}$$

$$\frac{70}{3} = \frac{L_M + 240}{24}$$

$$L_M = 560 - 240$$

$$L_M = 320 \text{ meters}$$

Let in  $T$  sec Lichhavi express will pass Gorakhdham express

$$\text{Relative speed} = (84 - 72) \times \frac{5}{18} = \frac{10}{3} \text{ m/sec}$$

$$\text{Required time (T)} = \frac{(280 + 320) \times 3}{10} = 180 \text{ sec}$$

S4. Ans. (b)

Sol. Let speed of train =  $S$  km/hr

$$(S - 6) = \frac{75}{15} \times 2 \times \frac{18}{5}$$

$$S - 6 = 36$$

$$S = 42 \text{ km/hr}$$

Let speed of the second person =  $x$  km/hr

$$\therefore (42 - x) = \frac{75}{27} \times 4 \times \frac{18}{5}$$

$$42 - x = 40$$

$$x = 2\text{km/hr}$$

S5. Ans.(b)

Sol.

Let original speed of the train was  $x$  km/hr.

And original time was  $t$  hours

$$\therefore xt = 250 \dots (i)$$

$$(x - 25) \left(t + \frac{1}{2}\right) = 250 \dots (ii)$$

Using (i) & (ii)

$$xt = (x - 25) \left(t + \frac{1}{2}\right)$$

$$t = \frac{x-25}{50}$$

Putting value of  $t$  in (i)

$$x \times \frac{x-25}{50} = 250$$

$$\Rightarrow x^2 - 25x - 12500 = 0$$

$$\Rightarrow (x - 125)(x + 100) = 0$$

$$\Rightarrow x = 125 \text{ km/hr}$$

S6. Ans.(c)

Sol.

Lets speed of train P, Q and R be  $S_1, S_2$  and  $S_3$  respectively

$$\text{Speed of train P } (S_1) = \frac{180}{\frac{27}{4}} \text{ m/s}$$

$$= \frac{80 \text{ m}}{3 \text{ s}}$$

Speed of train Q ( $S_2$ )

$$\frac{80}{3} + S_2 = \frac{240+180}{9}$$

$$S_2 = \frac{420}{9} - \frac{80}{3}$$

$$S_2 = 20 \text{ m/s}$$

Speed of train R ( $S_3$ )

$$\frac{80}{3} - S_3 = \frac{210+180}{39}$$

$$S_3 = \frac{80}{3} - 10$$

$$S_3 = \frac{50}{3} \text{ m/s}$$

Lets required time be  $T$  sec

$$\text{Required time} = 20 + \frac{50}{3} = \frac{240+210}{T}$$

$$\frac{110}{3} = \frac{450}{T}$$

$$T = \frac{450 \times 3}{110}$$

$$T = 12\frac{3}{11} \text{ sec}$$

S7. Ans.(e)

Sol.

Let usual speed of boat in still water =  $x$

River speed =  $y$

ATQ,

$$\frac{(x-y)250}{100} = (2x - y)$$

$$5x - 5y = 4x - 2y$$

$$x = 3y$$

Now,

$$\frac{60}{x-y} + \frac{60}{x+y} = 22.5$$

$$\frac{60}{2y} + \frac{60}{4y} = 22.5$$

$$y = 2 \text{ km/hr}$$

$$x = 6 \text{ km/hr}$$

$$\text{Required time} = \frac{80}{6+2}$$

$$= 10 \text{ hr}$$



S8. Ans.(b)

Sol.

Let speed of Train 'X' =  $x$

$$\Rightarrow \text{Speed of train 'Y'} = \frac{(100+100)}{100} \times x = 2x$$

Let, length of train 'X' =  $y$

$$\Rightarrow \text{Length of train 'Y'} = \frac{150}{100} \times y = 1.5y$$

ATQ,

$$2 = \frac{y}{x} \Rightarrow y = 2x$$

$$\text{Required time} = \frac{1.5y+y}{2x-x} = \frac{2.5y}{x} = \frac{2.5 \times 2x}{x} = 5 \text{ seconds}$$

S9. Ans.(b)

Sol. Distance covered by First train (i.e. train start from Delhi) in first hour

$$= \frac{1}{6} \times 480 = 80 \text{ km}$$

$$\Rightarrow \text{Speed of first train} = 80 \text{ km/h}$$

Let speed of second train =  $x$  km/h

$$\therefore \frac{(480-80)}{80} = \frac{(480-160)}{x}$$

$$\Rightarrow x = \frac{320}{5}$$

$$\Rightarrow x = 64 \text{ km/h}$$

S10. Ans.(c)

Sol.

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

and speed of current is =  $y$  km/hr

$$\text{so, } x = \frac{120}{100}(x - y)$$

$$\frac{x}{y} = \frac{6}{1}$$

Let  $x = 6n$  &  $y = n$

According to question,

$$\frac{105}{7n} - \frac{\frac{200}{7}\% \times 105}{5n} = 3$$

$$\frac{15}{n} - \frac{6}{n} = 3$$

$$n = \frac{9}{3} = 3$$

Speed of current = 3 km/hr



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