Instructions
For the following questions answer them individually

Question 1
A man covers one-third of total distance by train at 60 kmph. Half of the remaining distance he covers by bus at 40 kmph. At what speed he should cover the remaining distance so that he can attain 50 kmph for the entire journey?

A 48 kmph
B 55 kmph
C $580/11$ kmph
D $600/11$ kmph
E 52 kmph

Answer: D

Explanation:
Let the distance be 'd' that has to be covered.
So the distance covered by the train = $\frac{d}{3}$
Time taken to cover $\frac{d}{3}$ distance by train = $\frac{d}{60} = \frac{d}{180}$ hr
Remaining distance = $d - \frac{d}{3} = \frac{2d}{3}$
Distance covered by the bus = $\frac{2d}{3}$
Time taken to cover $\frac{d}{3}$ distance by the bus = $\frac{d}{40} = \frac{d}{120}$ hr
Remaining distance = $\frac{2d}{3} - \frac{d}{3} = \frac{d}{3}$
Let assume that the remaining distance is covered by x kmph
Time taken to cover this distance = $\frac{d}{3x}$ hr
For entire distance 'd'
$50 = \frac{\frac{d}{180} + \frac{d}{120} + \frac{d}{3x}}{1}$
$50 = \frac{360}{2x + 3x + 120}$
$50 = \frac{360}{5x} = \frac{600}{11}$ kmph

Question 2
A local train can travel 50% faster than Rohan’s car. Ram is travelling by the local train. Both start from Dadar at the same time and reach Borivali that’s 30 kms away at the same time. On the way, however, the local train lost 5 minutes while stopping at the stations. Figure out the speed of the car (in km/hr):

A 150
B 100
C 140
D 120
E None of the above.

Answer: D

Explanation:
Let assume Car’s speed = S km/hr.
So local train’s speed will be = 1.5*S km/hr
It is given that both the vehicle covered same distance = 30 kms and Car took 5 minutes more as compare to the local
Question 3
A cop sees a thief fleeing at a distance of 120 m and starts chasing him. A train of length 300 m running in the opposite direction as that of the thief and the cop, crosses the thief in 15 seconds and the police in 10 seconds. How many seconds after spotting the thief will the cop catch the thief?

A 24 seconds
B 18 seconds
C 6 seconds
D 12 seconds
E 15 seconds

Answer: D

Explanation:
We do not know the speed of the cop or the thief. But, using the train, we can find the difference between the relative speeds of the cop and the thief.

Sum of the speeds of the train and the thief = \( \frac{300}{15} = 20 \text{ m/s} \)
Sum of the speeds of the train and the cop = \( \frac{300}{10} = 30 \text{ m/s} \)

Difference between the speeds of the cop and the thief = \( 30 - 20 = 10 \text{ m/s} \).
The cop will take \( \frac{120}{10} = 12 \text{ seconds} \) to catch the thief after spotting him.
Therefore, option D is the right answer.

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Question 4
Two trains of lengths 172m and 228m are coming towards each other at speeds of 108 Km/hr and 72 Km/hr respectively. How long will they take to cross each other completely?

A 7.2 s
B 2.2 s
C 3.4 s
D 3.6 s
E 8 s

Answer: E

Explanation:
The speeds of the trains are 30 m/s and 20 m/s respectively.
The relative speed = 50 m/s
The length to traversed to completely cross each other = 400 m
Time = \( \frac{400}{50} = 8 \text{ seconds} \)
Question 5
A train travelling at 90 km/hr crosses another train which is running in opposite direction in 20 seconds. The length of the second train is half the length of the first train and its speed is 20 percent less than the first train. Find the time which the first train will take to cross a platform of length 300 m.

A 20 seconds
B 25 seconds
C 36 seconds
D 40 seconds
E 50 seconds

Answer: C

Explanation:
Speed of first train = 90 km/hr = 25 m/s
Let the length of first train be 2l. So the length of second train will be l.
Speed of second train = 90*0.8 = 72 km/hr = 20 m/s
Hence, total distance travelled in 20 s = 45*20 = 900 m
3l = 900 m
=> l = 300 m
Hence, the length of first train is 600 m.
Time taken to cross a platform of length 300 m = 900 / 25 = 36 seconds.
Hence, option C is the correct answer.

Question 6
Trains A, B and platform P are of same length. Train A takes 20 seconds to cross the platform completely while train B takes 30 seconds to cross the same. How much time will the trains take to cross each other if they are running in the opposite direction?

A 10 seconds
B 12 seconds
C 15 seconds
D 8 seconds
E 16 seconds

Answer: B

Explanation:
Let the length of train A, train B and platform be l.
Total length a train has to traverse to cross the platform = length of the train + length of the platform = l+ l = 2l.
Speed of train A = 2l/20
Speed of train B = 2l/30
When they trains run towards each other, the relative speed will be the sum of the individual speeds.
=> Relative speed = 2l/20 + 2l/30 = 10l/60
Total length the trains must travel to cross each other completely = length of train A + length of train B = l+l = 2l.
=> Time taken by the trains to completely cross each other = 2l/(10l/60) = 12 seconds.
Therefore, option B is the right answer.
Question 7
Train B takes twice as much time as train A to cross the same platform. If the speeds of both the trains is the same and the length of platform is half the length of train A, what is the ratio of the length of train A to train B?

A 2:3
B 1:5
C 3:5
D 2:5
E 1:3

Answer: D

Explanation:
Let the length of train A be l and the length of train B be d.
Length of platform = l/2 = 0.5l
Speed of both the trains is same.
A takes twice as much time as B to cross the platform.
(l+0.5l)/t = (d+0.5l)/2t
2l+1 = d + 0.5l
2.5l = d
=> l/d = 2/5.
Therefore, option D is the right answer.

Question 8
2 trains are of equal length. They take 120 seconds to cross each other while running in the same direction. If the ratio of the speeds of the 2 trains is 3:2, the time taken by the trains to cross each other completely while running in the opposite directions is

A 60 seconds
B 48 seconds
C 30 seconds
D 12 seconds
E 24 seconds

Answer: E

Explanation:
Let the length of the trains be ‘l’.
When they are running in the same direction, they take 120 seconds to cross each other.
=> (l+l)/(3x-2x) = 120
2l/x = 120 seconds.

When they run in the opposite direction, the relative speed will be 3x+2x = 5x.
=>(l+l)(3x+2x) = ?
2l/5x = ?
We know that 2l/x = 120.
=> 2l/5x = 120/5 = 24 seconds.
Therefore, option E is the right answer.
**Question 9**

Two trains of length 200 m and 160 m can cross each other in 30 seconds when they are running in the same direction. It is also known that if they are running in the opposite directions then they can cross each other in 15 seconds. What is the speed of the faster train?

A 72 km/hr  
B 64.8 km/hr  
C 90 km/hr  
D 83.33 km/hr  
E 54 km/hr  
**Answer:** B

**Explanation:**
The total distance that the trains need to cover to completely cross each other is 200 + 160 = 360 m.

Now, let the speed of the faster and slower trains be \( f \) and \( s \)

When they are travelling in same direction, the effective speed becomes \( f - s \)

Hence, we have  
\( f - s = \frac{360}{30} = 12 \)

Similarly, when they are travelling in same direction the effective speed becomes \( f + s \)

Hence,  
\( f + s = \frac{360}{15} = 24 \)

Solving the two equations we get  
\( 2f = 36 \)

\( f = 18 \text{ m/s} = 64.8 \text{ km/hr} \)

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**Question 10**

A train 200 m long can cross an electric pole in 10 seconds. How much time will it take to overtake another train which is running in the same direction on a parallel track? It is known that the length of the second train is twice that of first and its speed is half the speed of the first train.

A 1 minute  
B 1 minute 20 seconds  
C 1 minute 30 seconds  
D 45 seconds  
E 1 minute 45 seconds  
**Answer:** A

**Explanation:**
The train takes 10 seconds to cross the electric pole. Hence, the speed of the train will be \( \frac{200}{10} = 20 \text{ m/s} \)

Now the length of second train is 400 m and its speed is \( 20/2 = 10 \text{ m/s} \).

Hence, the effective relative speed is 10 m/s and the total distance to be covered is 600 m.

Hence, the required time will be \( \frac{600}{10} = 60 \text{ seconds} \).

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**Question 11**

A train X runs at a speed of 36 kmph. It crosses another train Y running in the opposite direction with the same speed in 80 seconds. Also, the train crosses a platform of length 500 m in 100 seconds. The length of train Y is

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A  800 m
B  900 m
C  1000 m
D  1100 m
E  1200 m

Answer: D

Explanation:
Speed of the train = 36 kmph = 36*5/18 = 10 m/s.
Let the length of train X be x and length of train Y be y.
We know that train X crosses a platform of length 500 m in 100 seconds.
(x+500)/10 = 100
x+500 = 1000
x = 500 m.
Both trains X and Y run at the same speed but in the opposite direction.
Therefore, (x+y)/(10+10) = 80
500+y = 1600 m
=> y = 1100 m.
Therefore, option D is the right answer.

Question 12

Two trains are of equal length. The speed of one train is 50% more than the other. If the 2 trains were running in the opposite directions, they will cross each other completely in 100 seconds. What will be the time taken by the 2 trains to cross each other if they are running in the same direction?

A  150 seconds
B  200 seconds
C  250 seconds
D  500 seconds
E  1000 seconds

Answer: D

Explanation:
Let the length of one train be 'l'.
Let the speed of one train be 's' and the speed of the other train be 1.5s.
It has been given that 2l/(s+1.5s) = 100 (Running in opposite directions)
2l/s = 250 seconds 1

If the trains run in the same direction, relative velocity will be 1.5s - s = 0.5s
2l/0.5s = 2*(2l/s) = 2*250 = 500 seconds.
Therefore, option D is the right answer.

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Explanation:
Let the length of train A be 2d.
Length of train B = d.
Length of the platform = d.

Time taken by train A to cross 2d+d = Time taken by train B to cross d+d = 10 seconds.
Therefore, their speeds are in the ratio 3:2.
Speed of train A = 3d/10 and speed of train B = 2d/10.
When trains A and B are moving towards each other, total distance to cross will be the sum of the lengths of the trains = d+2d = 3d.
Relative speed will be the sum of the speed of the 2 trains since they are moving towards each other.
Relative speed = 3d/10 + 2d/10 = 5d/10 = d/2.
Time taken = 3d/(d/2) = 6 seconds. Therefore, option B is the right answer.

Question 14
A 200 m long train can cross a pole in 10 seconds. Another train of same length can cross a 400 m long platform in 60 seconds. If both the trains are travelling in opposite directions then how much time will they take to cross each other completely?

A  20 seconds
B  15 seconds
C  12 seconds
D  25 seconds
E  13.33 seconds

Answer: E

Explanation:
The length of the train is 200 m and it takes 10 seconds to cross a pole. Hence, the speed of the train will be 200/10 = 20 m/s
The length of second train is also 200 m. The length of the platform is 400 m. So the total distance covered is 600 m.
Time taken is 60 seconds. So speed of the second train is 600/60 = 10 m/s
Now both the trains are moving in opposite directions. So their speeds will add up. Hence, required time to cross will be 400/30 = 13.33 seconds

Question 15
A 260 meter long train crosses a 120 meter long wall in 19 seconds. What is the speed of the train?

A  27 km/hr
B  49 km/hr
C  72 km/hr
D  70 km/hr
None of these  

**Answer:** C

**Explanation:**
Length of the train is 260 metres
Length of the wall is 120 metres
Total is 260 + 120 = 380 metres
Time taken is 19 seconds.

Hence, the speed is 380/19 = 20 m/s = 72 Km/hr
Answer is option C

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**Question 16**
A train running at speed of 120 kmph crosses a signal in 15 seconds. What is the length of the train in meters?

A 300  
B 200  
C 500  
D Cannot determined  
E None of these  

**Answer:** C

**Explanation:**
Speed of train = 120 kmph  
= \((120 \times \frac{5}{18})\) m/s = \(\frac{100}{3}\) m/s  
Let length of the train = \(l\) meters
Using, speed = distance/time  
\(\Rightarrow \frac{100}{3} = \frac{l}{15}\)  
\(\Rightarrow l = \frac{100}{3} \times 15\)  
\(\Rightarrow l = 100 \times 5 = 500\) meters
\(\Rightarrow\) Ans - (C)

**Question 17**
A 240-metre long train running at the speed of 60 kmph will take how much time to cross another 270-metre long train running in opposite direction at the speed of 48 kmph?

A 17 seconds  
B 3 seconds  
C 12 seconds  
D 8 seconds  
E None of these
Answer: A

Explanation:
Length of first train = 240 m and second train = 270 m
Total length of the two trains = 240 + 270 = 510 m
Speed of first train = 60 kmph and second train = 48 kmph
Since, the trains are moving in opposite direction, thus relative speed = 60 + 48 = 108 kmph
= \( \frac{108 \times \frac{5}{18}}{30} \) m/s
Let time taken = \( t \) seconds
Using, time = distance/speed
=> \( t = \frac{510}{30} = 17 \) seconds
=> Ans - (A)

Question 18
At 60% of its usual speed, a train of length \( L \) metres crosses a platform 240 metre long in 15 seconds. At its usual speed, the train crosses a pole in 6 seconds. What is the value of \( L \) (in metre)?

A 270  
B 225  
C 220  
D 480  
E 240

Answer: D

Explanation:
Let speed of the train = \( 10x \) m/s
Length of train = \( l \) m
Time taken to cross the pole = 6 sec
Using, speed = \( \frac{\text{distance}}{\text{time}} \)
=> \( 10x = \frac{l}{6} \)
=> \( x = \frac{l}{60} \)
Now, 60% of the speed = \( \frac{60}{100} \times 10x = 6x \) m/s
Length of platform = 240 m
Acc. to ques, => \( 6x = \frac{240 - l}{15} \)
=> \( \frac{l}{60} = \frac{240 - l}{15} \)
=> \( 10 = \frac{240 - l}{15} \)
=> \( 15l = 2400 + 10l \)
=> \( 15l - 10l = 5l = 2400 \)
=> \( l = \frac{2400}{5} = 480 \) m

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Question 19

At its usual speed, a train of length L metres crosses platform 300 metre long in 25 seconds. At 50% of its usual speed, the train crosses a vertical pole in 20 seconds. What is the value of L?

A 160
B 260
C 200
D 310
E 350

Answer: C

Explanation:
Let usual speed of the train = \(10x\) m/s
Now, 50% of the speed = \(\frac{50}{100} \times 10x = 5x\) m/s
Length of train = \(l\) m
Time taken to cross the pole = 20 sec
Using, \(\text{speed} = \frac{\text{distance}}{\text{time}}\)

\[=> 5x = \frac{l}{20}\]
\[=> x = \frac{l}{100}\]

Length of platform = 300 m
Acc. to ques, => \(10x = \frac{300+l}{25}\)

\[=> 10 \times \frac{l}{100} = \frac{300+l}{25}\]
\[=> \frac{l}{10} = \frac{300+l}{25}\]

\[=> 25l = 3000 + 10l\]
\[=> 25l - 10l = 15l = 3000\]
\[=> l = \frac{3000}{15} = 200\) m

Question 20

At its usual speed, a 150 metre long train crosses a platform of length \(L\) metres in 24 seconds. AT 75% of its usual speed, the train crosses a vertical pole in 12 seconds. What is the value of \(L\)?

A 250
B 225
C 240
D 260
E 280

Answer: A

Explanation:
Let speed of the train = \(20x\) m/s
Now, 75% of the speed = \(\frac{75}{100} \times 20x = 15x\) m/s
Length of train = 150 m
Time taken to cross the pole = 12 sec

Using, \( \text{speed} = \frac{\text{distance}}{\text{time}} \)

\[ \Rightarrow 15x = \frac{150}{12} \]
\[ \Rightarrow x = \frac{10}{5} = 6 \]

Length of platform = \( l \) m

Acc. to ques, \( \Rightarrow 20x = \frac{150+l}{24} \)

\[ \Rightarrow 20 \times 6 = \frac{150+l}{24} \]
\[ \Rightarrow \frac{50}{3} = \frac{150+l}{24} \]
\[ \Rightarrow 150 + l = 400 \]
\[ \Rightarrow l = 400 - 150 = 250 \text{ m} \]