Q1-ans
Option- B.16,8

Let the speed of the faster train be v1 and the speed of the slower train be v2.

When the trains are running in the same direction, the relative speed is v1 - v2.

The distance traveled by the faster train to cross the slower train is 125 + 115 = 240 meters.

The time taken for the faster train to cross the slower train is 30 seconds.

Therefore, the relative speed is v1 - v2 = 240/30 = 8 meters per second.

When the trains are running in opposite directions, the relative speed is v1 + v2.

The distance traveled by the two trains to cross each other is 125 + 115 = 240 meters.

The time taken for the two trains to cross each other is 10 seconds.

Therefore, the relative speed is v1 + v2 = 240/10 = 24 meters per second.

Now, we can solve for v1 and v2.

v1 - v2 = 8

v1 + v2 = 24

Adding these two equations, we get 2v1 = 32

Therefore, v1 = 16 meters per second.

Substituting this value of v1 into the first equation, we get v2 = 8 meters per second.

Therefore, the speed of the faster train is 16 meters per second and the speed of the slower train is 8 met ers per second.

Q2-ans
Option- D.10 seconds

The speed of the first train is 50 km/hr = 50000/3600 = 13.88 m/s
The speed of the second train is 60 km/hr = 60000/3600 = 16.66 m/s
The relative speed of the trains is 13.88 + 16.66 = 30.54 m/s
The total distance to be covered is 140 + 166 = 306 meters
The time taken to cross each other is 306/30.54 = 10 seconds
So the answer is 10

Q3-ans

Let’s first find the speed of each train when it is running past the man.

Train 1: 125 meters / 36 seconds = 3.47 meters per second
Train 2: 115 meters / 26 seconds = 4.42 meters per second
Now, we can find the relative speed of the two trains by adding their speeds together.

Relative speed = 3.47 meters per second + 4.42 meters per second = 7.89 meters per second
Finally, we can find the ratio of their speeds by dividing the speed of Train 1 by the speed of Train 2.

Ratio of speeds = 3.47 meters per second / 4.42 meters per second = 0.78
Therefore, the ratio of the speeds of the two trains is 78:100.

Q4-ans
Option D.33

Time taken to cross the platform= total distance covered/speed of train
Distance covered = length of train + length of platform

= 240 + 400 = 660 meters

Speed of train = Distance (length of train) / time taken to cross the pole
240/12= 20m/sec

So,time taken to cross the platform =660/33= 33m/s

Q5-ans
Option C. 240 & 660

Speed of train = 108 km/hr = 108×5/18 = 30 m/s
Let the length of train = L
Length of platform = P
Time taken to cross the platform = 30 s

Distance covered in 30 s = 30×30 = 900 m
L+P = 900 --- (1)
Now, the train crosses a man running at 12 km/hr in the same direction of train in 9 seconds.
Relative speed of train with respect to man = 108-12 = 96 km/hr = 96×5/18 = 26.66 m/s
Distance covered in 9 s = 26.66×9 = 240 m
L = 240 m
From (1), P = 900-L = 900-240 = 660 m
Therefore, the length of the train is 240 m and the length of the platform is 660 m.

Q6-ans
Option C. 340 km

The distance between the stations is equal to the sum of distance covered by each train.

Let the distance covered by first distance = X

So, the distance covered by second train = X + 20

When the two trains starts from two different stations at the same time towards each other, they take sam e time to meet each other.

time= distance/speed

so
45X = 40X + 800

45X − 40X = 800

5X = 800
X = 160km
Then distance covered by second train = 160 + 20 =180 km

So, the distance between stations P and Q = 160 + 180 = 340 km

Q7-ans

Let's first find the speed of each train.

Train 1: 28 seconds / 240 meters = 1.125 meters per second
Train 2: 18 seconds / 180 meters = 1 meter per second
Now, let's find the total distance traveled by the two trains when they cross each other.

Total distance = (1.125 meters per second) x (26 seconds) = 29.375 meters
Now, we can find the ratio of their speeds by dividing the speed of train 1 by the speed of train 2.

Ratio of speeds = (1.125 meters per second) / (1 meter per second) = 1.125
Therefore, the ratio of the speeds of the two trains is 1.125:1.

Q8-ans
Option B.
4:3

As the trains start simultaneously, they will cover equal distances in the first half of the journey.

Therefore,
x/9 = y/16
x:y = 16:9
Therefore, the ratio of the speeds of the two trains is 16:9.

Alternatively, we can also solve this problem using the concept of relative speed.

Let the relative speed of the two trains be z.

As the trains are moving in opposite directions, their relative speed will be added.

Therefore,
z = x + y

z = 16 + 9 = 25
x:y = z/2 = 25/2 = 16:9
Therefore, the ratio of the speeds of the two trains is 4:3.

Q9-ans
OPtion D.
79.2 km/hr

Length of the Bridge = 264 m.
Time taken to pass the bridge = 20 sec.
Time taken to passe the post = 8 sec.
Length of the train = X m (Let.)
To pass the bridge train need to cover Train's length + Bridge legnth (X + 264).
Speed = Distance covered / time taken
Now,
X/8 = (264 + X)/20
20X = 264 *8 + 8X
20X - X = 264 *8
12X = 264 *8
X = (264 *8)/12

X = 176 m.(length of the train)
Speed of the train = 176/8 = 22 m/sec = (22*18)/5 = 79.2 Kmph.

Q10-ans
Option A. 14.4 sec

Let length of each train be x meter.
Then, speed of 1st train = x/18m/sec
Speed of 2nd train = x/12m/sec
Now,
When both trains cross each other, time taken
/
=2x/((x/18+(x/12)) = 14.4sec
/

Q11-ans
Option A. 230 m

The length of the other train is 230 meters.

The relative speed of the two trains is 120 + 80 = 200 kmph = 500/9 m/s.

The total distance that the trains need to travel to cross each other is 270 + x meters, where x is the lengt h of the other train.

The time it takes for the trains to cross each other is 9 seconds.

Therefore, we have the equation 500/9 = (270 + x) / 9.

Solving for x, we get x = 230 meters.

Q12-ans
Option B.10.00

Assume both trains meet after x hours after 7 am

Distance covered by train starting from P in x hours = 20x km

Distance covered by train starting from Q in (x-1) hours = 25(x-1)

Total distance = 110

=> 20x + 25(x-1) = 110

=> 45x = 135

=> x= 3

Means, they meet after 3 hours after 7 am, ie, they meet at 10 am

Q13-ans
Option C. 60

The distance between stations A and B is 60 kilometers.

Let the speed of the train when it covers the distance in 45 minutes be v. The distance traveled in 45 minutes is v * 45/60 = 3v/4 kilometers.

When the speed of the train is reduced by 5 kilometers per hour, the new speed is v - 5. The distance traveled in 48 minutes is (v - 5) * 48/60 = 3v - 10/4 kilometers.

Since the train travels the same distance in both cases, we have the equation 3v/4 = 3v - 10/4. Solving for v, we get v = 60 kilometers per hour.

Therefore, the distance between stations A and B is 3v/4 = 60 * 3/4 = 60 kilometers.

Q14-ans
Option A. 5 hours

The average speed of the first train is (2*126*90)/(126+90) = 105 km/h.

The distance between stations P and Q is 525 km.

Therefore, the time taken by the second train to travel 525 km is 525/105= 5 hours.

Q15-ans
Option C.10

Without stoppages, in 1 hr train covers 72 km.
With stoppages, in 1 hr train covers 60 km.
Thus, average speed of the train is reduced by 72 - 60 = 12 km
So the time taken to cover 12km is now actually used up at stoppages.
Time taken to cover 12 km =(12/72) 60 minutes = 10 minutes

the train stops for 1O minutes in an hour on average.