

# Speed, Time & Distance Questions & Answers

# 25 Practice Questions - Speed, Time & Distance

**Q1**. Amir travels half of his journey by Bus at a Speed of 200/9m/s and half of his journey by Metro at 120km/h. Calculate his average Speed over the entire journey.

- (A) 86 km/h
- (B) 75 km/h
- (C) 90 km/h
- (D) 96 km/h

**Q2**. Ram by bus takes double the Time taken by train to travel from Bangalore to Chennai. What is the Speed of the train if the Speed of the bus is 40 km/hr.

- (A) 40 kmph
- (B) 60 kmph
- (C) 80 kmph
- (D) 30 kmph

**Q3.** Vivek and Bharath go home daily after Office by an Office Cab which has a Speed of 40 kmph. Vivek takes 20% more Time than Bharath to reach his home. If Bharath's house is at a Distance of 30 km from the office, then calculate the Distance of Vivek's house from the office.

- (A) 36 km
- (B) 40 km
- (C) 45 km
- (D) 42 km

**Q4**. One day Prakash started late for office by 1 hour, so he increased his normal Speed by 5 km/hr so that he reaches on Time. Find the normal Time taken to reach his office if his office is at a Distance of 60 km from his house

- (A) 3 hrs
- (B) 5 hrs
- (C) 6 hrs
- (D) 4 hrs

**Q5**. If Sajesh increases his Speed from 12 km/hr to 15 km/hr while coming from Office to home, he reaches home one hour early. Determine the Distance between his home and the office.

- (A) 40 kms
- (B) 50 kms
- (C) 60 kms
- (D) 70 kms



#### **Directions for Question 6-7**:

A starts from home for his office. He travels downhill, then on flatground and then uphill to reach his office.

It takes him 3 hrs to reach the office. On the way back home A takes 3 hrs 10 min to reach home along the same route.

The Speeds downhill is 60 km/hr, on flat ground is 48 km/hr and uphill is 40 km/hr.

Q6. What is the Distance between A's home and his office?

- (A) 144 km
- (B) 148 km
- (C) 154 km
- (D) 100 km

**Q7**. By what Distance should his office be shifted so that the Time taken to go to the office is the same as Time taken to reach home from the office?

- (A) 20 km
- (B) 30 km
- (C) 40 km
- (D) 15 km

**Q8**. Amit and Bala leave at 8 am everyday to meet each other at point X after 2 hours. On one day, Amit walks at 5/6th of the usual Speed while Bala starts one hour late.Bala thus increases his Speed by 25%. Now Amit takes ½ hour more than usual to meet Bala and they meet ½ km away from point X. Find out the Speeds of A and B and the total Distance travelled by them?

- (A) 5 kmph, 5 kmph, 20 km
- (B) 6 kmph, 4 kmph, 22 km
- (C) 6 kmph, 4 kmph, 20 km
- (D) 4 kmph, 6 kmph, 20 km

**Q9**. A 50m long platoon is marching ahead. The last person in the platoon wants to give a letter to the first person leading the platoon. So while the platoon is marching he runs ahead, reaches the first person and hands over the letter to him and without stopping he runs and comes back to his original position. In the meantime the whole platoon has moved ahead by 50m. How much Distance (approximately) did the last person cover in that Time. Assuming that he ran the whole Distance with uniform Speed.

- (A) 120m
- (B) 100m
- (C) 102m
- (D) 97m



**Q10**. Amar, Akbar and Anthony ran on a racetrack, with Amar finishing 160 m ahead of Akbar and 400 m ahead of Anthony. Akbar finished the race 300 m ahead of Anthony. The three of them ran the entire Distance with their respective constant Speeds. What was the length of the racetrack?

- (A) 600m
- (B) 800m
- (C) 1000m
- (D) 500m

**Q11**. A and B are moving in a circular track in the same direction. They start simultaneously in a race which requires them to cover 15 rounds. Whenever A &B meet, it was found that the ratio of the number of rounds covered by them till then is 3:1. The Time taken by B to complete the race if they meet every 5 minutes is?

- (A) 75 mins
- (B) 100 min
- (C) 150 min
- (D) 50 min

**Q12.** A and B drive separately to an ice-cream parlour. A's average driving Speed is greater than B's average driving Speed by 1/3rd of B's driving Speed, and A drives twice as many kilometers as B.What is the ratio of the number of hours A spends driving to the parlour to the number of hours B spends driving to the parlour?

- (A) 2:3
- (B) 4:3
- (C) 3:2
- (D) 8:3

**Q13.** Ahmed and Sahil set out together on bicycle traveling at 15 and 12 kilometers per hour, respectively. After 40 minutes, Ahmed stops to fix a flat tire. If it takes Ahmed one hour to fix the flat tire and Sahil continues to ride during this Time, how many hours will it take Ahmed to catch up to Sahil assuming he resumes his ride at 15 kilometers per hour? (consider Ahmed's deceleration /acceleration before/after the flat to be negligible)

- (A) 4.5
- (B) 3 1/3
- (C) 3.5
- (D) 4

**Q14.** Ajay and Arun start running simultaneously from the diametrically opposite ends of a circular track towards each other at 15km/h and 25km/h respectively. After every 10 minutes their Speed reduces to half of their current Speeds. If the length of the circular track is 1500 m,how many Times will Ajay and Arun meet on the track?

(A) 6



- (B) 9
- (C) 11
- (D) 7

**Q15.** Katrina walks down an up-escalator and counts 150 steps. Priyanka walks up the same escalator and counts 75 steps. Katrina takes three times as many steps in a given Time as Priyanka. How many steps are visible on the escalator?

- (A) 105
- (B) 150
- (C) 135
- (D) 120

**Q16.** Two guys Abhinav and Bineesh are walking down an escalator in the direction of the motion of the escalator. A takes three steps in the same Time when B takes two steps. When A covers 90 steps he gets out of the escalator while B takes 80 steps to get out of the escalator. If they start from opposite ends using the same escalator, find the difference in steps covered by them when they meet.

- (A) 48
- (B) 20
- (C) 30
- (D) 24

**Q17**. Two ships take different routes to reach the "spice capital of the world". The Distances traveled by the two ships are in the ratio of 3:2. Ship 1 moves at 40kmph and ship 2 travel at 60kmph. If the two ships arrived at their destination with a Time gap of 1 hour, what is the Distance traveled by both the ships together?

- (A) 72km
- (B) 120km
- (C) 150km
- (D) none

**Q18.** The 'moving walkway' in an uptown mall in Paris is a 300-metre long walkway consisting of a conveyor belt that moves continuously at 3 meters per second. When Ishan steps on the walkway, a group of teenagers that are also on the walkway stands 120 meters in front of him. He walks toward the group at a combined rate (including both walkway and foot Speed) of 6 meters per second relative to the ground. Once Ishan reaches the group of teenagers, he stops walking and stands with them until the walkway ends. What is Ishan's average rate of movement for his trip along the moving walkway?

- (A) 2 m/s
- (B) 3 m/s
- (C) 3.5 m/s
- (D) 5 m/s



**Q19.** Peter, Sana, and Gavin are visiting the Adams family who are staying 200km away. Each of their walking Speeds is 10 km/h. Initially, Peter and Gavin travel in a car at the rate of 50kmph and Sana walks the Distance. After a while, Gavin gets off the car as he feels nauseated and walks the rest of the Distance to the house. Peter goes back in the car to fetch Sana and they all reach the house at the same Time. What was the entire Time involved in traveling?

- (A) 10 hours
- (B) 7 hours
- (C) 8 1/2 hours
- (D) 8 hours

**Q20.** Anu and Varsha are running on a circular track at a rate of 44 m/min and 22 m/min respectively. They start on the same point and run in opposite directions. The diameter of the track is 140 m. When they both meet for the 12th Time, what is the Distance that Anu would have covered over Varsha? (A) 1500

- (A) 1500
- (B) 1825
- (C) 1760
- (D) none of these

**Q21.** Consider a circular track of circumference= 1400 m. There are 2 bikes which start from point A and move in the opposite direction. Once they meet, they start moving in the opposite directions. The one that moves in the anticlockwise direction to the other one has a Speed in the ratio of 36:48 kmph.Find the Distance of the two bikes from A when they meet for the 15th Time?

- (A) 1200
- (B) 250
- (C) 350
- (D) none of these

**Q22.** Afsan is deciding which car to rent for a day for a class trip, from among anPinnova and a Bilto. The rate/km is in a ratio of 3:2, the seating capacity is in a ratio of 5:2. The Speeds are in the ratio of 7:4. Find out the ratio of the maximum cost incurred that day for the two car types, given that there is no wastage of capacity or Time?

- (A) 60:28
- (B) 56:30
- (C) 105:16
- (D) 140:12

**Q23.** Amit and Aman have to travel from Delhi to Jaipur in their respective cars. Amit is driving at 60 kmph while Aman is driving at 90 kmph. Find the Time taken by Aman to reach Jaipur if Amit takes 9 hrs.

- (A) 6 hours
- (B) 4 hours



(C) 2 hours

(D) none of these

**Q24.** Ram and Shyam are standing at two ends of a room with a width of 30 m. They start walking towards each other along the width of the room with a Speed of 2 m/s and 1 m/s respectively. Find the total Distance traveled by Ram when he meets Shyam for the third Time.

- (A) 60 m
- (B) 100 m
- (C) 200 m
- (D) none of these

**Q25.** Two trains A and B leave stations P and Q simultaneously and travel towards Q and P respectively on the same route. After meeting en route, A takes one hour to reach Q and B takes 4 hours to reach P.How long did A take to cover the entire Distance?

- (A) 6 hours
- (B) 4 hours
- (C) 2 hours
- (D) none of these

# Speed Time & Distance Answers

#### 1) Option (d)

As the Distance covered is same with both the Speeds, the average Speed will be the harmonic mean of the individual Speed.

200/9m/s = (200\*3600)/((9\*1000)) = 80 km/h

So, average Speed = (2\*a\*b)/(a + b) = (2\*80\*120)/(80 + 120) = 96 km/h.

#### 2) Option (c)

Distance = Speed × Time

As Distance covered in both the cases is constant, Speed will be inversely proportional to time.

So, if Time by bus: Time by train = 2: 1, Speed of bus: Speed of train = 1: 2

Speed of bus is 40 km/hr, so Speed of train is 80 km/hr.

#### 3) Option (a)

Distance = Speed x Time

In both the cases, Speed is constant so Distance will be proportional to the time.

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Vivek takes 20% more than Bharath. So, assume that Bharath takes 100 minutes then Vivek will take 20% more i.e. 20 minutes more, so 120 minutes. So, the ratio of Time taken by Vivek and Bharath = 120/100 = 6/5. Distance is proportional to the Time taken, so ratio of Distance of Vivek's House and Bharath's House = 6/5, Bharath's house is at a Distance of 30 km, so Vivek's house will be at the Distance of  $(6/5)^*30 = 36$  km.

#### 4) Option (d)

Method 1:

Suppose the normal Time taken is 't' then when he is late by 1 hour, Time taken by him = 't - 1'.

Normal Speed = 60/t, Speed when he wants to reach in t - 1 Time = 60/(t - 1)(60/(t-1))- (60/t) = 5? t2 - t - 12 = 0 ? (t - 4) (t + 3) = 0 ? t = 4 and t = - 3 (-3 is not possible)So, normal Time taken = 4 hours. Hence option (d).

Method 2: Reverse Gear Approach

Take a middle answer option, say 5 hours Normal Speed = 60/5 = 12 kmph Speed increased to 12+5=17 kmph. 60/17 = 3.53 hours,

the difference is more than 1 hour. This is not the answer. We can also eliminate 6 hours, as that will result in a higher Time difference.

Answer is either 3 or 4 hours(answer is close to 5) Trying for 4 hours, Normal Speed= 60/4 = 15 km/h

Speed increased to 20 km/h 60/20=3. 4-3 =1. This is the answer.

#### 5) Option (c)

Sajesh increases his Speed from 12 km/hr to 15 km/hr, so increase in Speed = 3 km/hour 1/4. In both the cases, Distance covered remains the same. So, applying constant product rule: His Speed increases by 1/4 so Time will decrease by 1/5.

Here Time is decreasing by 1 hour and 1 hour is 1/5 of the actual Time taken. So, actual Time taken = 5 hours. So, Distance between Office and House = 5 \* 12 = 60 kms. Hence option (c). Alternatively, you can also check the answer options.

(a) Distance = 40 kms, actual Speed = 12. Actual Time taken = 40/12. New Time taken = 40/15.

(40/12)– (40/15)≠ 1

(b) Distance = 50 km, actual Speed = 12. Actual Time taken = 50/12. New Time taken = 50/15. (50/12)–(50/15) $\neq$ 1

(c) Distance = 60 kms, actual Speed = 12. Actual Time taken = 60/12= 5 hrs. New Time taken = 60/15 = 4 hrs.

Difference = 1 hour.

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#### 6) Option (b)

Let x,y and z be the Distances uphill, on flat ground and downhill respectively. Then

 $\frac{z}{60} + \frac{y}{48} + \frac{x}{40} = 3 \qquad \dots (i)$ and  $\frac{z}{40} + \frac{y}{48} + \frac{x}{60} = \frac{19}{6} \qquad \dots (ii)$ Adding (i) and (ii) we get  $\frac{x + y + z}{24} = 3 + \frac{19}{6} \Rightarrow x + y + z = 148 \text{ km}$ 

# 7) Option (a)

Let AC be 3 km more than DE. Then

Then	$\frac{a}{40}$	$-\frac{a}{60}$	$=\frac{1}{6}$		
$\Rightarrow$ a = 20 km					

Thus, if the Distance is decreased by 20 km, the Time taken will be the same.

#### 8)Option (c)

If you observe the options carefully, you can decide which answer option to start with. Since the fraction 5/6 is involved. Start with an option which is a multiple of 6; option (b) and option (c) Now one has 2 Distances 20 km and 22 km A's original Speed = 6kmph. In 2 hours he will travel 12 km B's original Speed = 4 kmph. In 2 hours he will travel 8 km 12+8=20 and not 22. Here itself, you can mark the answer as option (c) Verifying A's new Speed = 5 kmph B's new Speed = 5 kmph After 1 hour A travels 5 km, B travels 0 After 2 hours A travels 10 km (total), B travels 5. Total =15 km. They thus meet after 2.5 hours.

# 9) Option (a)

It is given that the platoon and the last person moved with uniform Speed. Also, they both moved for the identical amount of Time. Hence, the ratio of the Distance they covered – while person moving forward and backward – are equal. Let's assume that when the last person reached the first person, the platoon moved X meters forward. Thus, while moving forward the last person moved (50+X) meters whereas the platoon moved X meters. Similarly, while moving back the last person moved [50-(50-X)] = X meters whereas the platoon moved (50-X) meters. Now, as the ratios are equal

 $(50+X)/X = X/(50-X) (50+X)^{*}(50-X) = X^{*}X$  Solving, X=35.355 meters Thus, total Distance covered by the last person =  $(50+X) + X = 2^{*}X + 50 = 2^{*}(35.355) + 50 = 120.71$  meters =120 m (approximately).



# 10) Option (b)

Using the concept of ratios of Speed (Speed directly proportional to Distance), we can easily arrive at the totalDistance. The images below give a picture of the Distances when Amar and Akbar finish the race

FINISH 400	AMAR	160	FINISH 400	AKBAR	300
	ANTHON	<i>,</i>			
×			×		
START			START		

Length of the race track = 400 + x The ratio of Akbar and Anthony's Speed can be arrived at as (240+x)/x = (400+x)/(100+x)

Now go from answer options, answer will be option (b) 800 m Verifying,  $x = 400\ 640/400 = 800/500$ . Thus, answer is option (b).

# 11) Option (c)

The ratio of Speeds of A and B= 3:1, This means that when A makes 1.5 rounds, B makes 0.5 round. For B to complete the race of 15 rounds, it would take him  $15/0.5 \times 5 = 150$  minutes.

# 12) Option (c)

Solve the question using assumption If B's Speed is 3, then A's Speed is 3+(3/3) = 4 If A travels 12 km, B travels 6 km Ratio of Time taken = A:B = 3:2. Option (c).

# 13) Option (b)

In 2/3 of an hour A travels 10 km in 40 min B travels 8 km in 40 min After one hour, A would have still traveled only 10 km and B would have traveled 20 km, their relative Speed = 15-12= 3 km/hr A gains this 10 km in 10/3 = 3.33 hours.

# 14) Option (b)

the total Distance traveled before they come to a halt can be calculated as 40(1+1/2+1/4+1/8...)/6 = 40((1/(1-1/2))/6)=13.33 km They cover a Distance of 750 m for the first time they meet, and subsequently cover a Distance of 1500 m each Time they meet, hence if they meet 8 Times, then the



Distance covered will be 1500 \* 8 + 750 = 12750, which is lesser than 13,333.33. If they meet 10 Times then the Distance would be 14250>13333.33. Hence they meet 9 Times.

# 15) Option (d)

Let T be Time Katrina takes to make 25 steps. Then Katrina takes 3T to make 75, and Priyanka takes 2T to make 150. Suppose the escalator has N steps visible and moves n steps in Time T. Then Priyanka covers N + 2n = 150, N – 3n = 75. Hence N = 120, n = 15 = 200 (d) is the right answer.

#### 16) Option (c)

Let the escalator moves x steps when A walks down 90 steps. Total number of steps on a stationary escalator = x + 90. When A takes 90 steps, B should have taken 60 steps and the escalator x steps. So when B takes 80 steps, the escalator should have taken  $4/3^*x$  steps. So,  $4/3^*x + 80 = x + 90 =$  Total number of steps in the escalator when it is stationary. So x = 30. Hence, total number of steps = 120. By the Time they meet, together they will 120 steps in the ratio 3:2. i.e 72 and 48 steps. So, the difference is 24. Option (d).

# 17) Option (b)

Time taken by Ship 1 = 3x/40 hr Time taken by Ship 2 = 2x/60 hr 3x/40-2x/60= 1

10x=240 x=24 Distances traveled are 48 & 72= 120.

#### 18) Option (d)

Consider that Ishan's journey will end when the group reaches the end of the walkway (as long as he catches up with the crowd before the walkway ends). When he steps on the walkway, the crowd is 180 metres from the end. The walkway travels this Distance in (180/3) = 60 seconds, and Ishan's average rate of movement is 300/60 = 5 metres per second.

#### 19) Option (d)

Let x be the number of hours Sana walks at 10kmph. x will be the no. of hours Peter and Gavin traveled by car at 50kmph. Let x1 be the number of hours that Gavin walks till Peter reaches Sana. Let x2 be the number of hours when Peter and Sana travel in the car till the destination. The total Distance traversed by each of them can be evaluated as follows

Peter = 50x-50\*1+50\*2=200-(1)

Sana= 10x+10\*1+50\*2=200 (2)

Gavin = 50x+10\*1+10\*2=200-(3)

Solving we get t1= 2 hours, t=3 hours, t2=3 hours. Total = 8 hours.

20) Option (c)





This problem can be solved by noticing that the Speeds are in a ratio of 2:1. The Distances covered will, therefore, be in a ratio of 2:1. When they meet for the 8th Time, they would have covered the entire Distance of the track 8 Times = 8 (2pr) .Anu would have covered 8 Times the Distance and Varsha 4 Times the Distance (Total= 12, ratio 2:1) Difference = 4(2pr) = 4x 2 x (22/7)x(140/2) = 1760.

# 21) Option (d)

1400 m track is divided into 7 parts of 200 m each. The Speeds of the two bikes are in a ratio of 3:4, each time they meet, they will cover a Distance in the ratio of 3:4 They will thus meet for the first Time at 3/7th the Distance which will happen at point 4 is 600 m. The second time they will meet at the starting point. 3rd Time at point 4... and so on so the 15th Time, they meet at 600 m which is 800 m from A.

# 22) Option (c)

Cost incurred (maximum ) a Speed x capacity x cost/km Required ratio=  $(7x^* 5x^* 3x)/(4x^* 2x^* 2x)=105/16$ .

# 23) option (a)

As the Distance covered is constant in both the cases, the Time taken will be inversely proportional to the Speed. In the problem, Speed of Amit and Aman is in ratio 60: 90 or 2:3. So the ratio of the Time taken by Amit to that taken by Aman will be in the ratio 3:2. So if Amit takes 9 hrs, Aman will take 6 hrs.

# 24) Option (b)

This is an instance of Case 1 as illustrated above. When Ram meets Shyam for the third Time, they together would have covered a Distance of 5d, i.e 5x30m = 150 m. Ratio of Speed of Ram and Shyam = 2:1, so the total Distance traveled by them will also be in the ratio 2:1 as the Time taken is constant. So the Distance traveled by Ram will be  $2/3 \times 150 = 100 \text{ m}$ .

# 25) Option (d)

A takes 1 hour after meeting and B takes 4 hours after meeting. Hence Time traveled before meeting = v1.4 = 2 hours Time taken by A= 2+1 = 3 hours



