

Target RBI Grade B 2023
Top 150 Questions ✓
Quant *Most Important*
Lecture 6 – Time speed &
Distance



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What we have to cover in Time & Distance

- Concept 1 – When Distance is constant
- Concept 2 – When time is constant
- Concept 3 – Average Speed ✓
- Concept 4 – Concept of Relative speed
- Concept 5 – Trains and Boats & Stream
- Data sufficiency and Data Interpretation on Time & Distance ✓



$$\text{Distance} = \text{Time} \times \text{Speed}$$

Same Unit

↓

Hours

Minutes

Seconds

days

↳ Distance travelled in per unit time

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$
$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$60 \text{ km/hr}$$

$$\text{m/sec}$$



① Distance Constant

Time $\propto \frac{1}{\text{Speed}}$

Speed $a = b$

Time $b = a$

600km

	A	B
	40 km/h	50 km/h
Spd	4	5
Time	$\frac{600}{40} = 15$	$\frac{600}{50} = 12$

Distance Constant ✓
Two speeds are given }

$$\text{Distance} = \frac{\text{Product of Speeds}}{\text{Sum of Speeds}} \times \text{Total Time}$$

$$\text{Distance} = \frac{\text{Product of Speeds} \times \text{diff of time}}{\text{diff of Speeds}}$$

Time Constant ✓✓

Speed \propto Distance

Speed $a = b$

Distance $a = b$



Q.1) Two cars run to a place at the speeds of 45 km/hr and 60 km/hr respectively. If the second car takes 5 hrs less than the first for the journey find the length of the journey.

- A) 900 km
B) 600 km
C) 700 km
D) 850 km

Distance Constant
Two speeds are given
Diff of Time

$$\begin{aligned} \text{Distance} &= \frac{\text{Product of Speeds}}{\text{diff of Speeds}} \times \text{diff of time} \\ &= \frac{45 \times 60}{60 - 45} \times 5 \\ &= \frac{45 \times 60}{15} \times 5 = 900 \text{ km} \end{aligned}$$



Q.2) A man covers a certain distance between his house and office on scooter. Having an average speed of 30 km/hr, he is late by 10 min. However, with a speed of 40 km/hr, he reaches his office 5 min earlier. Find the distance between his house and office.

- A) 30 km
- B) 50 km
- C) 40 km
- D) 25 km

Handwritten solution:

30 km/h Late by 10 min → 9:10
40 km/h Early by 5 min → 8:55

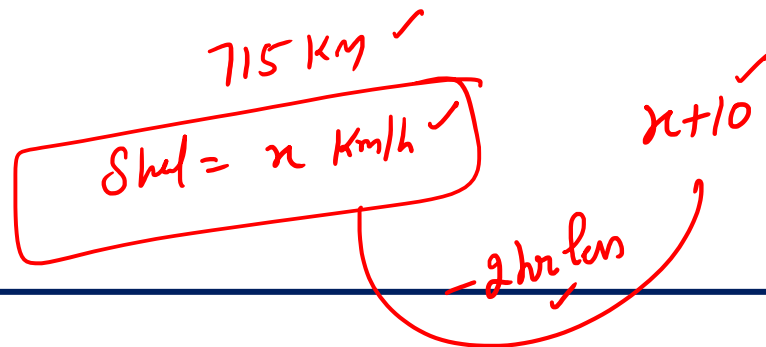
15 min = $\frac{15}{60} = \frac{1}{4}$ hours

$$\text{Distance} = \frac{30 \times \frac{1}{4}}{1} \times \frac{1}{4}$$
$$= \underline{\underline{30 \text{ km}}}$$



Q.3) A car covers a distance of 715 km at a constant speed. If the speed of the car would have been 10 km/hr more, then it would have taken 2 hrs less to cover the same distance. What is the original speed of the car?

- A) 45 km/hr
- B) 50 km/hr
- C) 55 km/hr
- D) 65 km/hr

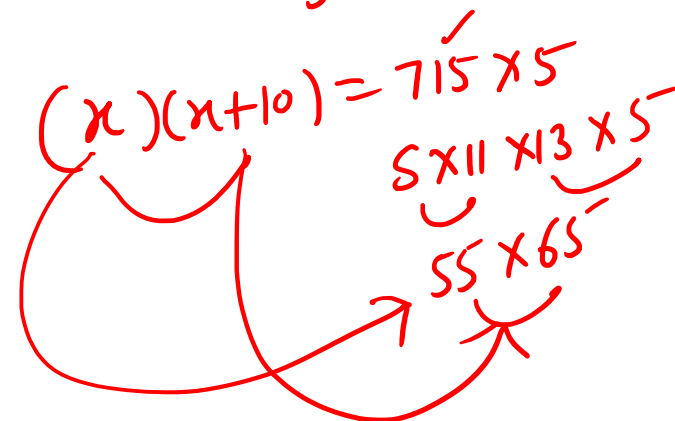


$$\begin{array}{r} 5 \overline{) 715} \\ \underline{5} \\ 11 \\ \underline{11} \\ 13 \\ \underline{13} \\ 0 \end{array}$$

$$715 = \frac{x(x+10)}{\frac{10}{5}} \times 2$$

$$(x)(x+10) = 715 \times 5$$

$$5 \times 11 \times 13 \times 5$$

$$55 \times 65$$




Q4. A car travels from P to Q at a constant speed. If its speed were increased by 10 km/hr, it would have been taken one hour lesser to cover the distance. It would have taken further 45 minutes lesser if the speed were further increased by 10 km/hr. The distance between the two cities is

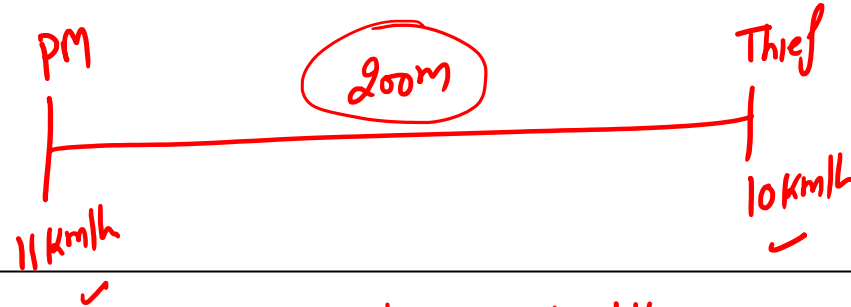
- A 540 km
- B 420 km
- C 600 km
- D 620 km

Home Work



Q5. A thief is noticed by a police man from a distance of 200m. The thief starts running and the policeman chases him. The thief and the policeman run at the rate of 10 km and 11 km per hour respectively. The distance (in metres) between them after 6 minutes is

- A 190
- B 200
- C 100
- D 150



$$\begin{aligned} 1 \text{ hr} &\rightarrow 1 \text{ Km} \\ 6 \text{ mint} &\rightarrow 100 \text{ m} \\ 6 \text{ mint} &\rightarrow \boxed{100 \text{ m}} \end{aligned}$$

$$\begin{aligned} 200 \text{ m} - 100 \text{ m} \\ = \underline{\underline{100 \text{ m}}} \end{aligned}$$



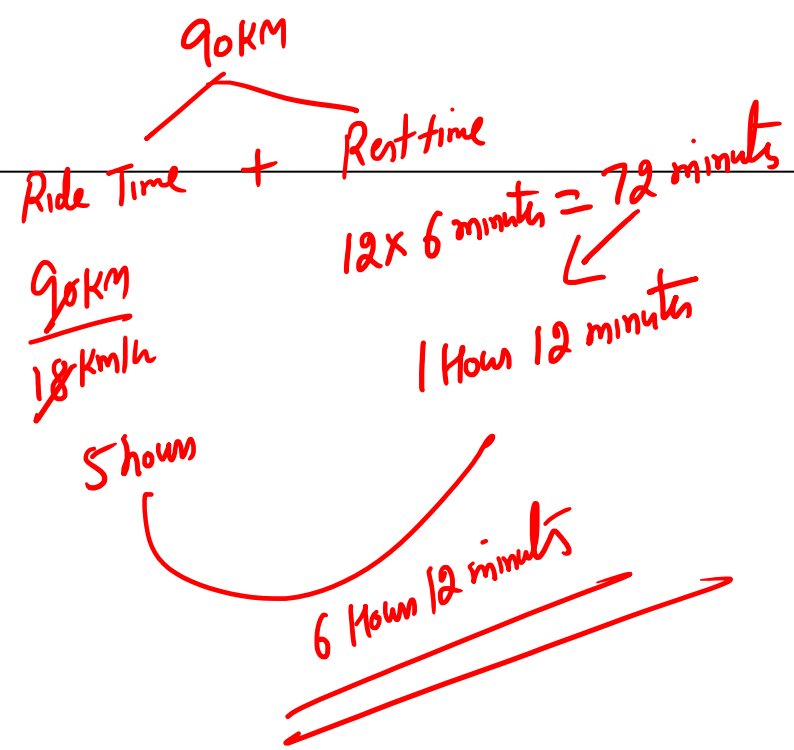
Q6. A man rides at the rate of 18 km/hr, but stops for 6 minutes to change horses at the end of every 7th km. The time that he will take to cover a distance of 90 km is

- A 6 hrs
- B 6 hrs. 12 min.
- C 6 hrs. 18 min.
- D 6 hrs. 24 min.



$$\frac{90 \text{ km}}{7} = 12 \text{ times}$$

$$\frac{91}{7} = 13 \text{ times} \quad \text{X} \quad 92$$



T_{train}

Conversion of Speeds

Distance = Time \times Speed
Same Unit

$$1 \text{ km/h} = \frac{5}{18} \text{ m/sec.}$$

$$72 \text{ km/h} \rightarrow 22 \times \frac{5}{18} = 20 \text{ m/sec.}$$

m/sec \rightarrow km/h

$$\frac{3600 \times 60}{1000} = \frac{18}{5} \text{ km/h}$$

$$15 \text{ m/sec.} \rightarrow \frac{18 \times 18}{5} = 54 \text{ km/h}$$



Distance //

Train → Man, Point, Pole, teastall, No length

Train → Platform, Tunnel, Cave, train, Bridge, Length

Distance = Train's Length

A 100m long train passes a man standing on the platform in 10sec. Find the Speed of train.

Speed = $\frac{\text{Distance}}{\text{Time}} = \frac{100\text{m}}{10\text{sec}} = 10\text{m/sec.}$

$2 \times 10 \times \frac{18}{5} = 36\text{km/hr}$

Distance = Train's length + Length

A 200m long train passes another train standing train whose length is 300m in 30 sec. Find the Speed of train.

Speed = $\frac{\text{Distance}}{\text{Time}} = \frac{200 + 300}{30}$

$= \frac{500}{30} = \frac{50 \times 10}{3} \times \frac{18}{5} = 60\text{km/hr}$



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Q7. A 400 m long train cross a 200 m long platform in 30 seconds, the speed of train is :

- (a) 36 km/hr
- (b) 90 km/hr
- (c) 72 km/hr
- (d) 54 km/hr

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$= \frac{400 + 200}{30} = \frac{600}{30} = 20 \text{ m/sec}$$

$$= 20 \times \frac{18}{5} = 72 \text{ km/hr}$$



Question 8

A train of length 200 m is running at the speed of 60 km/h. In what time it will cross a man who is standing near railway track.

- (A) 12 sec
(C) 14 sec

- (B) 13 sec
(D) 15 sec

$$\begin{aligned} \text{Time} &= \frac{\text{Distance}}{\text{Speed}} = \frac{200\text{m}}{60\text{km/h}} \\ &= \frac{200}{60 \times \frac{5}{18}} = 4 \times 3 = 12\text{sec} \end{aligned}$$

Question 9

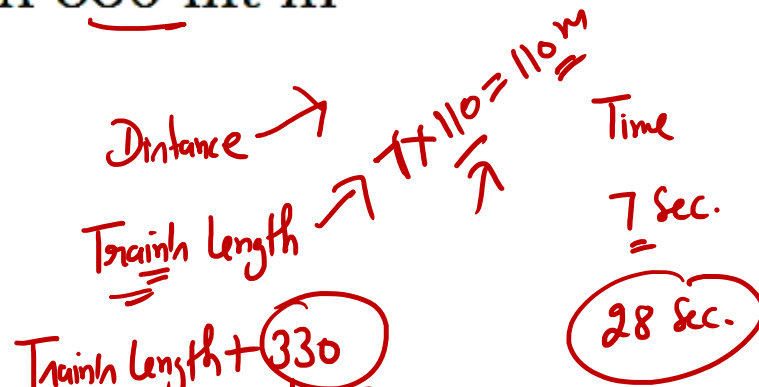
A train passed a man standing on the platform in 7 sec and passed a platform of length 330 mt in 28 sec. What is the length of train.

- (A) 105 mt ✓ (B) 110 mt
(C) 120 mt (D) 175 mt

$$\text{Speed} = \frac{330}{28} = \frac{110}{7} \text{ m/sec}$$

$$\begin{aligned} & \frac{110}{7} \times 28 \\ &= 440 \text{ m} - 330 \\ &= \underline{\underline{110 \text{ m}}} \end{aligned}$$

Train length + 330
= 7 sec. 28 sec.



Normal Speed
↓
Constant Time

9:00 -
9:00 -

Relative Speed =

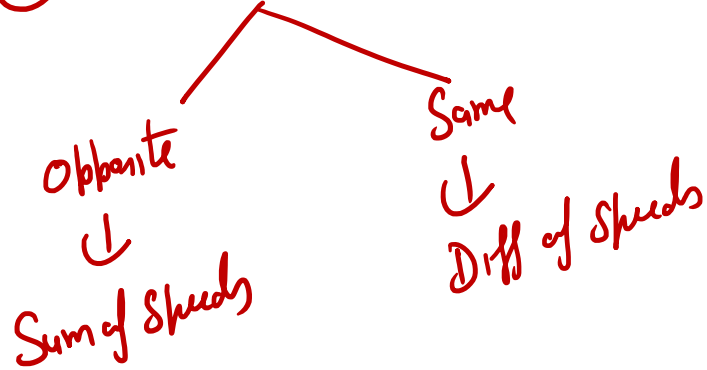
Two article
↓
Velocity

① Time Constant

③ There is no effect on distance

②

Direction



Question 10

A train of length 210 m is running at the speed of 45 km/h. A man is running at the speed of 9 km/h in opposite direction of train. In what time man will cross the train.

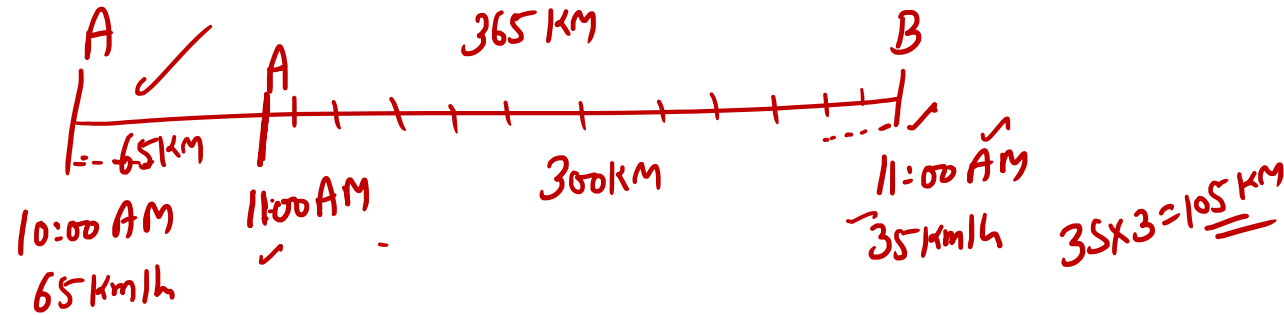
- (A) 12 sec (B) 13 sec
(C) 14 sec (D) 15 sec

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{210 \text{ m}}{54 \times \frac{5}{18}} = 14 \text{ Sec}$$

$RS = 45 + 9 = 54 \text{ km/h}$

Q11. The distance between two stations A and B is 365 km. A train starts at 10 A.M. from A and moves towards B at a speed of 65 km/hr. Another train starts B at 11 a.m and moves towards A at a speed of 35 km/hr. How far from B will two trains meet and at what time?

- A) 105,2 p.m
- B) 100,4 p.m
- C) 100,2 p.m
- D) 100,55 p.m



$$365 - 105 = 260 \text{ km}$$

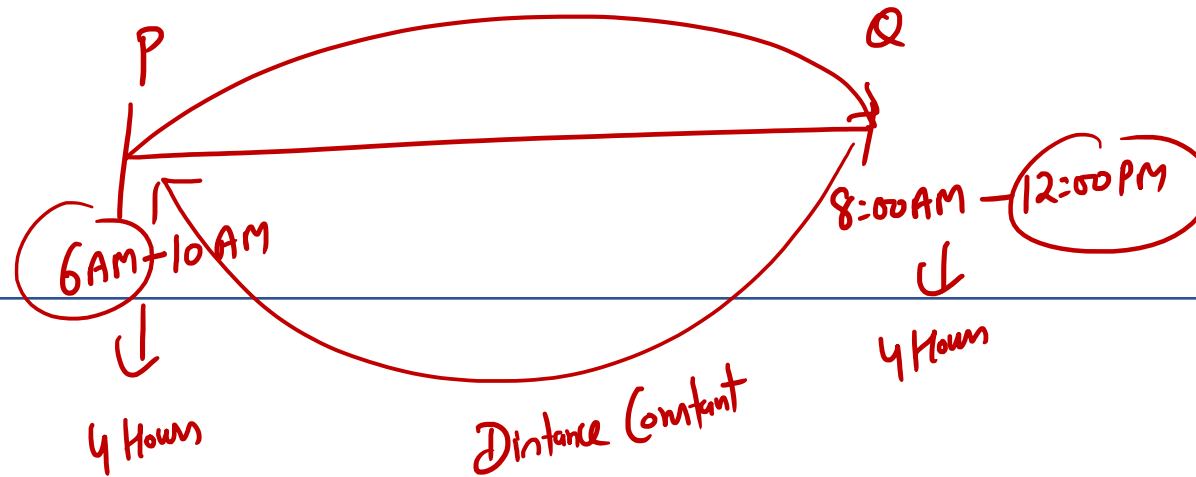
$$RS = 65 + 35 = 100 \text{ km/h}$$

$$\frac{260 \text{ km}}{100} = 2.6 \text{ hours}$$

$$11:00 + 2:00 = 2:00 \text{ PM}$$

Q12. A man leaves a point P at 6 am and reaches the point Q at 10 am. Another man leaves the point Q at 8 a.m and reaches the point P at 12 noon. At what time do they meet?

- A) 11 am
- B) 8 am
- C) 9 am
- D) 10 am



Same time.
Middle time = Answer

6AM - 12:00PM
9:00AM



Boats & Stream

Man/Boat in still water = x km/h

Rate of current/Stream = y km/h

Along the stream (Down Stream) = ~~⊕~~ Boat speed + Stream speed
= $x + y$ km/h

Against the stream (Up Stream) = Boat speed - Stream speed
= $x - y$ km/h

$$\text{Boat speed} = \frac{DS + US}{2}$$

$$\text{Stream speed} = \frac{DS - US}{2}$$



Q13. A boat takes half time in moving a certain distance downstream than upstream. What is ratio between rate of boat in still water and rate of current?

- A) 1:2
- B) 3:1
- C) 2:1
- D) 1:3

Distance Constant

	DS	US
Time	1	2
Speed	2	1

$Time \propto \frac{1}{Speed}$

↓	↓
$x+y$	$x-y$

$$\frac{x+y}{x-y} = \frac{2}{1}$$

$$x+y = 2x-2y$$

$$x = 3y$$

$$\frac{x}{y} = \frac{3}{1}$$

By obtain

3:1



Q14. The current of a stream runs at 4 km/hr. A boat takes three times in moving a certain distance upstream than downstream. What is the speed of the boat in still water is:

- A) 8 km/hr
B) 6 km/hr
C) 5 km/hr
D) 4 km/hr

	DS	US
Time	1	3

Speed	3	1
	↓	↓
	$x+4$	$x-4$

$$\frac{x+4}{x-4} = \frac{3}{1}$$
$$x+4 = 3x-12$$
$$2x = 16$$
$$x = 8$$



Q15. The current of a stream runs at 1 km/hr. A boat goes 35 km upstream and back again to the starting point in 12 hour. The speed of the boat in still water is: x km/h

- A) 8 km/hr ~~X~~
B) 4 km/hr ~~X~~
C) 2 km/hr ~~X~~
D) 6 km/hr ✓

$$DS = x + 1 \quad US = x - 1$$

$$\frac{35}{x+1} + \frac{35}{x-1} = 12$$

By option

$$\frac{35}{6+1} + \frac{35}{6-1}$$

$$\frac{35}{7} + \frac{35}{5} = 12 \text{ hours}$$
$$5 + 7 = 12$$



Q16 . A boatman goes 2 km against the current of stream in 1 hour and goes 1 km along the current in 10 minutes. How long will he take to go 5 km in stationary water?

- A) 40 min
- B) 1 hour
- C) 1 hr 15 min
- D) 1 hr 30 min

$$US = \frac{2 \text{ km}}{1 \text{ hour}} = 2 \text{ km/h}$$

$$DS = \frac{1 \text{ km}}{\frac{10}{60}} = 6 \text{ km/h}$$

$$\begin{aligned} \text{Still water Boat Speed} &= \frac{DS + US}{2} \\ &= \frac{6 + 2}{2} = 4 \text{ km/h} \end{aligned}$$

$$\text{Time} = \frac{5 \text{ km}}{4 \text{ km/h}}$$

$$= 1 \frac{1}{4} \text{ hour}$$

$$= \underline{\underline{1 \text{ hour } 15 \text{ minutes}}}$$



Q17. Speed of a boat is 5 km per hour in still water and the speed of the stream is 3 km per hour. If the boat take 3 hours to go to a place and come back, distance of place is:

- A) 3.75 km
- B) 4 km
- C) 4.8 km ✓
- D) 4.25 km

$$DS = S + 3 = 8 \text{ km/h} \quad US = S - 3 = 2 \text{ km/h}$$

$$\text{Total time} = \underline{\underline{3 \text{ hours}}}$$

$$\text{Distance} = \frac{\text{Product of Speeds}}{\text{Sum of Speeds}} \times \text{Total time}$$

$$= \frac{8 \times 2}{8 + 2} \times 3$$

$$= \frac{48}{10} = \underline{\underline{4.8 \text{ km}}}$$



Q18.

Quantity I: A bus travels a distance 60km at the speed of 30kmph. It covers the next 15km of its journey at the speed of 5kmph and the last 60km of its journey at the speed of 20kmph. Find the average speed of the bus.

Quantity II: A car covers a distance of 240km in a certain amount of time at speed of 30 kmph. What is the average speed of bike that covers distance of 30km less than that of the car in 2 hours less than time taken by car?

- A. Quantity I > Quantity II
- B. Quantity I ≥ Quantity II
- C. Quantity II > Quantity I
- D. Quantity II ≥ Quantity I
- E. Quantity I = Quantity II or Relation cannot be established

①

$$\frac{60 \text{ KM}}{30 \text{ km/h}} = 2 \text{ hours}$$

$$\frac{15 \text{ KM}}{5 \text{ km/h}} = 3 \text{ hours}$$

$$\frac{60 \text{ KM}}{20 \text{ km/h}} = 3 \text{ hours}$$

$$\text{Average Speed} = \frac{\text{Total Distance}}{\text{Total time}} = \frac{60 + 15 + 60}{2 + 3 + 3} = \frac{135}{8} \text{ km/h} = 17 \frac{1}{8}$$

②

$$\frac{240}{30 \text{ km/h}} = 8 \text{ hours}$$

Bike

$$240 - 30 = 210 \text{ KM}$$

$$\frac{210}{6} = 35 \text{ km/h}$$

$$\text{Time} = 8 - 2 = 6 \text{ h}$$

① < ②



Q19.

Quantity I: A car travels from A to B at the rate of 40 kilometers per hour and returns from B to A at the rate of 60 kilometers per hour, find its average speed during the whole journey?

Quantity II: A car completed a journey of 400 kilometers in 12.5 hours. The first $\frac{3}{4}$ th of the journey was done at 30 kilometers per hour. Calculate the speed for the rest of the journey?

- A. Quantity I > Quantity II
- B. Quantity I \geq Quantity II
- C. Quantity II > Quantity I
- D. Quantity II \geq Quantity I
- E. Quantity I = Quantity II or Relation cannot be established.

Home Work



Each of the questions below consists of a statement and/or a question and two statements numbered I and II given below it.

You have to decide whether the data provided in the statements is/are sufficient to answer the question. Read both the statements and

Give answer (a) if the data in statement I alone are sufficient to answer the question, while the data in statement II alone are not sufficient to answer the question;

Give answer (B) if the data in statement II alone are sufficient to answer the question, while the data in statement I alone are not sufficient to answer the question;

Give answer (C) if the data either in statement I or in statement II alone are sufficient to answer the question;

Give answer (D) if the data even in both statements I and II together are not sufficient to answer the question; and

Give answer (E) if the data in both statements I and II together are necessary to answer the question.

Q20) What is the distance between city A and city B?

1. Bus starting from A reaches B at 6:15 p.m. at an average speed of 60 kmph.
2. Bus at an average speed of 40 kmph reaches A at 4:35 p.m if it starts from B exactly at noon.

① ? ——— 6:15 PM
X 60 km/h Distance = Time × Speed

②
12:00 PM 40 km 4:35 PM
D ✓



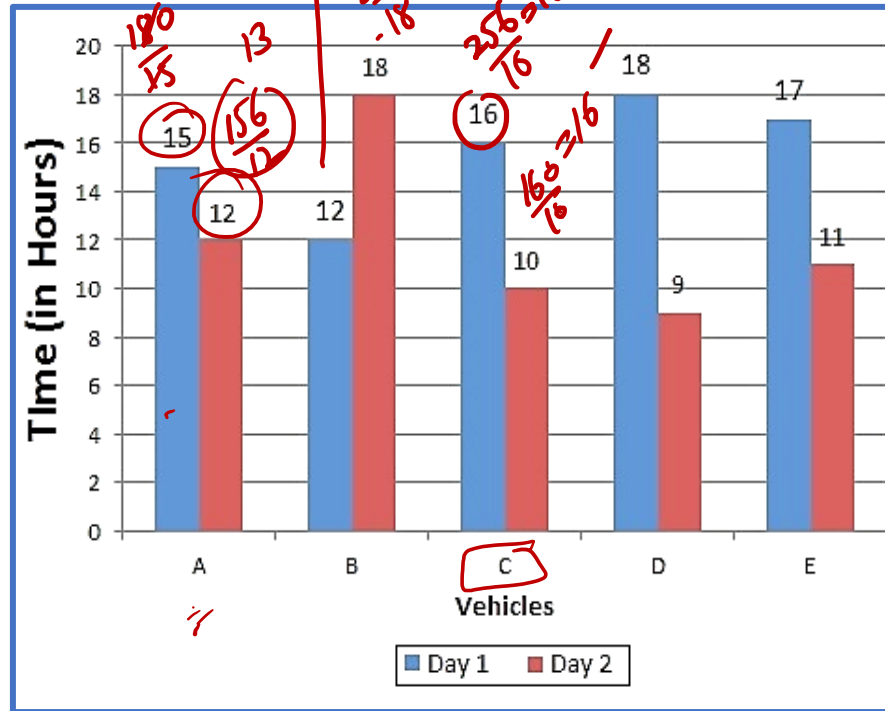
Study the following graph and table and answer the questions given below.

DISTANCE COVERED (IN KILOMETERES) BY FIVE VEHICLES

TIME TAKEN TO TRAVEL (in hours) BY FIVE VEHICLES ON TWO DIFFERENT DAYS



Vehicle	Day 1	Day 2
A	180	456
B	180	324
C	256	160
D	306	135
E	221	121



Q21. Which vehicle travelled at the same speed on both the days?

- A) A
- B) B
- C) C
- D) D
- E) E



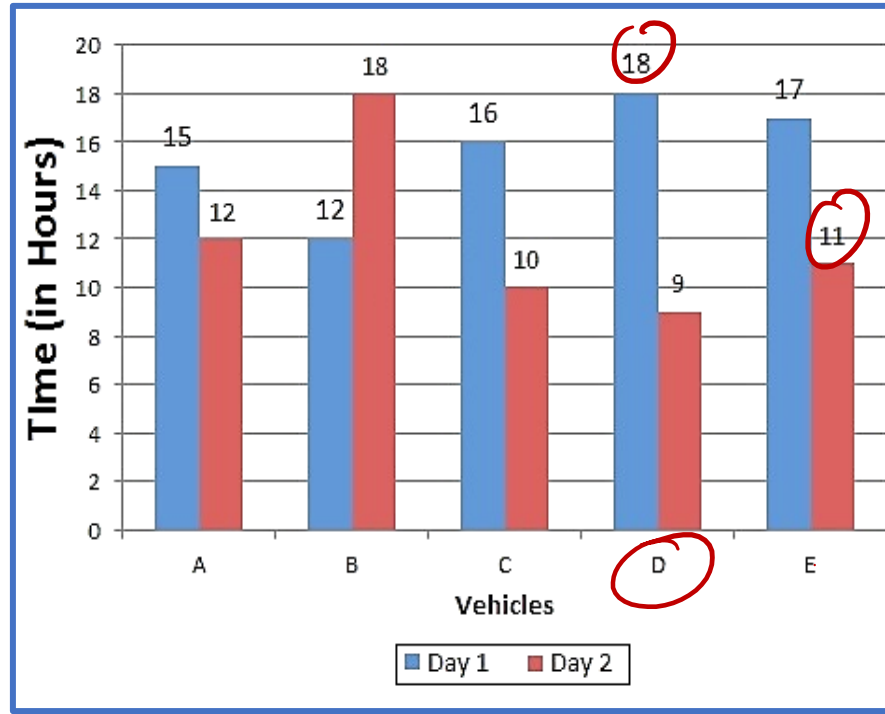
Study the following graph and table and answer the questions given below.

DISTANCE COVERED (IN KILOMETERES) BY FIVE VEHICLES



Vehicle	Day 1	Day 2
A	180	156
B	180	324
C	256	160
D	306	135
E	221	121

TIME TAKEN TO TRAVEL(in hours) BY FIVE VEHICLES ON TWO DIFFERENT DAYS



Q22. What is the difference between the speed of Vehicle D on day 1 and speed of Vehicle E on day 2?

- A) 3 kmph
- B) 4 kmph
- C) 5 kmph
- D) 6 kmph
- E) None of these

$$\frac{17}{306} = \frac{1}{18}$$

$$\frac{121}{11} = 11$$

$$17 - 11 = 6 \text{ kmph}$$

Study the following table carefully and answer the questions that follow.

Chart showing schedule of train from Anant Vihar to Mughal Sarai and number of passengers boarding at each station.

Station Name	Arrival Time	Departure Time	Halt Time(in minutes)	Distance travelled from origin (in Km)	No. of passengers boarding the train at each station
Anant Vihar	Start	07:30	–	0	400
Aligarh	09:19	09:21	2 min	125	251
Kanpur	13:45	13:55	10 min	434	339
Allahabad	16:45	16:55	10 min	628	203
Mughal Sarai	19:45	End	–	782	None

Q23. Distance between which two station is third lowest?

A) Anant Vihar – Aligarh

B) Aligarh – Kanpur

C) Kanpur – Allahabad

D) Allahabad – Mughal Sarai

E) None of these

125 Km ✓

$434 - 125 = 309$

$628 - 434 = 194 =$

$782 - 628$

$= 154 ✓$



Study the following table carefully and answer the questions that follow.

Chart showing schedule of train from Anant Vihar to Mughal Sarai and number of passengers boarding at each station.

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Kanpur	13:45	13:55	10 min	434	339
Allahabad	16:45	16:55	10 min	628	203
Mughal Sarai	19:45	End	–	782	None

Q24. What is the approximate average speed of train between Kanpur and Allahabad?

- A) 63 kmph
- B) 65 kmph
- C) 68 kmph
- D) 70 kmph ✓
- ~~E) None of these~~

Speed = $\frac{\text{Distance}}{\text{Time}} = \frac{194}{2} \times 60$

$13:55 - 16:45$
2 hours 50 min
 $2 \frac{50}{60} = \frac{17}{6}$ hr

$\frac{1164}{17} = 67$

126
144
124
112



Q25. A run 25% faster than B and is able to allow B a lead of 7 m to end a race in dead heat. What is the length of the race?

- A. 10 m
- B. 25 m
- C. 45 m
- D. 15 m
- E. 35 m



Q26. A boat running upstream takes 8 hours 48 minutes to cover a certain distance, while it takes 4 hours to cover the same distance running downstream. What is the ratio between the speed of the boat and speed of the water current respectively?

- A. 2 : 1
- B. 3 : 2
- C. 8 : 3
- D. 3 : 5
- E. 8 : 2



Q27. A train travelling at 100 km/h overtakes a motorbike travelling at 64 km/h in 40 sec. What is the length of the train in meters?

- A. 1777 m
- B. 1822 m
- C. 400 m
- D. 1111 m
- E. 600 m



Q28. A train Pawan express of length 380 m running with the speed of 108 km/h crosses a platform of certain length in 37 seconds. Another train, Toofan express of certain length running with a speed of 90 km/h crosses the platform in 42.6 seconds. What will be the time taken by both trains to cross each other if they run in opposite directions.

- A. 12 seconds
- B. 10 seconds
- C. 9 seconds
- D. 14 seconds
- E. 13 seconds



Q29 . Train A, 240 m long, crosses a platform double its length in 24 seconds. Find the approx. time taken to cross train B, 200 m long and travelling at 108 kmph in opposite direction?

- A. 12 seconds
- B. 10 seconds
- C. 14 seconds
- D. 15 seconds
- E. 7 seconds



Q30. A person travels a total distance of 1260 km partly by bike and partly by Car. The speed of Bike and Car is 4 : 3. If the distance travelled by car is 180 km more than that by bike, then What is the ratio of time taken by car and bike to travel?

- A. 11 : 9
- B. 16 : 6
- C. 9 : 16
- D. 16 : 9
- E. 17 : 5

Q.31) The taxi charges in a city consist of fixed charges and additional charges per kilometer. The fixed charges are for a distance of up to 5 km and additional charges are applicable per kilometer thereafter. The charge for a distance of 10 km is Rs 350 and for 25 km is Rs. 800. The charge for a distance of 30 km is-

- A. Rs. 800
- B. Rs. 750
- C. Rs. 900
- D. Rs. 950
- E. None of these

Home Work

Thank You

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