Time, Speed and Distance

Part 1

Definitions

- Distance = Speed × Time
- $1\ \text{kmph} = \frac{5}{18}$ m/s
- Average $Speed = \frac{Total\ Distance}{Total\ Time}$
- If the speed of the bodies is changed in the ratio x : y, then ratio of the time taken changes in the ratio y : x.

1. Convert 55 m/sec into km/h.

a. 198 kmph ✓
b. 11 kmph
c. 15 5/18 kmph
d. 19 kmph

2. A man covers 10.2 km in 3 hrs., the distance covered by him in 5 hrs. is

a. 18 km
b. 15 km
c. 16 km
d. 17 km ✓

3. A person travels from P to Q at a speed of 40 kmph and returns by increasing his speed by 50%. What is his average speed for both the trips?

a. 36 kmph

b. 45 kmph

c. 48 kmph ✓

d. 50 kmph

4. An express train travelled at an average speed of 100 kmph, stopping for 3 minutes after every 75 km. How long did it take to reach its destination 600 km from the starting point?

a. 6 hrs. 21' ✓

b. 6 hrs. 24'

c. 6 hrs. 27'

d. 6 hrs. 30'

5. A train can travel 50% faster than a car. Both start from the point A at the same time and reach point B 75 kms away from A at the same time. On the way, however the train lost about 12.5 minutes while stopping at the stations. The speed of the car is

a. 100 kmph
b. 110 kmph
c. 120 kmph
d. 180 kmph ✓

6. In covering a distance of 30 km, Abhay takes 2 hrs more than Sameer. If Abhay doubles his speed, then he would take 1 hr less than Sameer. Abhay speed is

a. 5 kmph
b. 6 kmph ✓
c. 6.25 kmph
d. 7.5 kmph

7. In a flight of 600 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200 kmph and the time of flight increased by 30 minutes. The duration of the flight is

a. 1 hr ✓
b. 2 hrs
c. 3 hrs
d. 4 hrs

8. If the distance travelled (d) by a particle in time t in seconds is given by the formula d(t)= 4+3t+2t^2+ t^3, then what is the distance travelled by the particle in the 5th second?

a. 72 meters
b. 82 meters ✓
c. 90 meters
d. 83 meters

9. If I walk with 30 miles/hr, I reach 1 hour before and if I walk with 20 miles/hr I reach 1 hour late. Find the distance between the two points and the exact time of reaching the destination is 11 am then find the speed with which I should walk.

a. 80 miles & 20 m/hr
b. 150 miles & 24 m/hr
c. 120 miles & 24 m/hr
d. 80 miles & 24 m/hr ✓

10. By walking at 3/4th of his usual speed, a man reaches office 20 minutes later than usual. What is his usual time?

a. 30 min
b. 60 min
c. 70 min ✓
d. 50 min

Concepts: Train Problems

- Time taken by the train to cross Pole = $\frac{Length\ of\ the\ train}{Speed\ of\ the\ Train}$

- Time taken by the train to cross Platform

$= \frac{Length\ of\ the\ train + Length\ of\ the\ Platform}{Speed\ of\ the\ Train}$

- Time taken by the faster train to overtake the other

$= \frac{Length\ of\ train\ 1 + Length\ of\ train\ 2}{Speed\ of\ train\ 1 - Speed\ of\ train\ 2}$

- Time taken by the two trains to cross each other.

$= \frac{Length\ of\ train\ 1 + Length\ of\ train\ 2}{Speed\ of\ train\ 1 + Speed\ of\ train\ 2}$

For Questions 11 to 16: A train 110 m long travels at 60 kmph. How long does it take?

11. To pass a telegraph post by the side of the track

a. 6.5 sec b. 6.6 sec ✓ c. 6.7 sec d. 6.8 sec 12.

12. To pass a man running at 6 kmph in the same direction as the train?

a. 6 1/3 sec b. 7 1/3 sec ✓ c. 8 1/3 sec d. 9 sec 13.

13. To pass a man running at 6 kmph in the opposite direction?

a. 9 sec b. 7 sec c. 8 sec d. 6 sec ✓

14. To pass a station platform 240 m long?

a. 21 sec ✓ b. 20 sec c. 19 sec d. 18 sec

15. To pass another train 170 m long, at 40 kmph in the same direction?

a. 50.4 sec ✓ b. 50.3 sec c. 50.1 sec d. 50 sec

16. To pass another train 170 m long, at 60 kmph in the opposite direction?

a. 8.0 sec b. 8.2 sec c. 8.4 sec ✓ d. 8.8 sec

17. A ship travelled 8100 km from the port. At that moment a jet plane, whose speed is 10 times the speed of the ship took off from the port. After how much distance will the plane overtake the ship?

a. 10000 kms
b. 9900 kms
c. 9743 kms
d. 9000 kms 

18. Train A crosses a pole in 20 seconds and crosses a train B of length 200 m in 20 seconds. Find the speed of train B?

a. 20 m/s
b. 10 m/s 
c. 15 m/s
d. 25 m/s

19. When I left home for office on a particular day my father's watch showed 7:00 PM, and when I reached my office my watch showed 7:50 PM. Next day in the morning when my father's watch showed 6:00 AM, my watch showed 7:30 AM. If my father's watch runs at normal speed and my watch gains 5 minutes per hour, then the time taken by me to reach my office from home, on that day, was closest

a. 15'
b. 13' 38 "
c. 13' 50" 👍
d. 14' 50"

20. Two cars, one moving towards north and the other towards east, leave the same place at the same time. The speed of one of them is greater than that of the other by 5 km per hour. At the end of two hours they are at a distance of 50 km from each other. Find the speed of car having a lower speed

a. 20 km/hr b. 12 km/hr c. 15 km/hr 👍 d. 10 km/hr

Concepts: Boats & Streams

Let Speed of boat in still water = u km/hr.

Speed of stream = v km/hr.

Speed of boat with stream (Down Stream), S_d = u + v

Speed of boat against stream (Up stream), S_u = u – v

Speed of boat in still water, $\mathbf{u} = \frac{S_d + S_u}{2}$

Speed of stream, $\mathbf{v} = \frac{S_d - S_u}{2}$

21. I row from A to B against the current in 8 hrs and B to A in 2 hrs. If the speed of the river is 9 m/sec, what is the speed of the boat in still water?

a. 15 m/sec ✌️
b. 18 m/sec
c. 22 m/sec
d. 12 m/sec

22. Two boats travel in opposite directions of a river, one upstream and the other downstream. The speed of each boat in still water is 10 kmph and the speed of the current is 2 kmph. If the length of the river is 100 km, then when will the boats meet?

a. 5 hrs ✌️
b. 6 hrs
c. 4 hrs
d. 7.5 hrs

23. The speed of a boat in still water is 12 kmph and the speed of the current is 3 kmph. How far can a boat travel upstream and downstream 10 hours?

a. 56 ¼ km ✌️ b. 60 km c. 58 km d. 54 ¼ km

24. A man can row upstream 36 km in 6 hours. If the speed of man in still water is 8 km/hr, find how much he can go downstream in 10 hours?

a. 400 km b. 300 km c. 200 km d. 100 km 👍

25. A man rows to a place 48 km distant and back in 14 hours. He finds that he can row 4 km with the stream in the same time as 3 km against the stream. Find the rate of stream?

a. 3 km/hr b. 2 km/hr c. 1 km/hr  d. 4 km/hr

Thank You

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