Teacher's Discussion

Time and Speed

Time and Distance মূলতঃ নিউটনীয় বলবিদ্যার প্রাথমিক অধ্যায়। পদার্থ বিজ্ঞানে গতি তিন প্রকার ঃ রৈখিক গতি, দ্বিমাত্রিক গতি ও ঘূর্ণন গতি। রৈখিক গতির তিনটি প্রকারভেদ হলো ঃ সমবেগে চলমান বস্তুর গতি, সম-ত্বরণ বা মন্দনে চলমান বস্তুর গতি এবং খাড়া উর্ধ্ব-মুখে নিক্ষিপ্ত ও উচু থেকে পড়ন্ত বস্তুর গতি। আমাদের ব্যাংক জবে আসা প্রশ্নগুলো কেবলমাত্র সমবেগে চলমান বস্তুর গতি নির্ভর। অর্থাৎ পদার্থবিদ্যার একটি বিশেষ অধ্যায়ের কেবল সামান্য অংশ নিয়ে এর বিচরণ। তবে সায়েন্স ব্যাকগ্রাউন্ডের স্টুডেন্টদের নিকট অধ্যায়টি ভীষণ সহজ হলেও, কমার্স বা আর্টস ব্যাকগ্রাউন্ডের জন্য এটি মোটেও সহজ নয়। অথচ ব্যাংকার্স রিক্রুটমেন্টের জন্য এটি হট টপিকস হলেও পরীক্ষার্থীদের জন্য সবচেয়ে ভীতিকর অধ্যায় হিসেবে বিবেচিত। অধ্যায়টি থেকে মিডিয়াম ও হার্ড লেভেলের কমপক্ষে ৩-৪টি অংক পরীক্ষায় এসে থাকে। পরীক্ষার প্রশ্নপত্রের সাথে সংগতি রেখে ও ক্লাসে পাঠদানের সুবিধা মাথায় রেখে টপিকস/টাইপ অনুসারে (প্রয়োজনীয় ক্ষেত্রে সাব-টাইপসে তথা কেস অনুসারে) নিয়ম ও সংশ্লিষ্ট সমস্যাগুলো দেওয়া হলো।

Discussed Types :

- Formula method
- Unitary method
- Equation method
- Average Speed
- Relative Speed

Topic – 01 : Formula Method

Speed : Linear distance covered by unit time period is called Speed.

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

Unit Conversion: $1\text{kph} = \frac{5}{18}\text{mps}$ $1\text{ mps} = \frac{18}{5}\text{ kph}$

01. Rony travelled 600m in 12 minutes, Find his speed in Kilometer per hour?
(A) 2 (B) 2.5 (C) 3 (D) 4 (E) None

02. Excluding stoppages, the speed of a bus is 54 kmph and including stoppages, it is 45kmph. For how many minutes does the bus stop per hour?
(A) 12 (B) 11 (C) 10 (D) 9 (E) None

Topic – 02 : Unitary Method

03. If a person walks at 14 km/hr instead of 10 km/hr, he would have walked 20 km more. The actual distance travelled by him is:
(A) 50 km (B) 56 km (C) 70 km (D) 80 km (E) None

04. In a 100 meter race, Jami beats Rony by 4 sec. If Jami allowed Rony to start 16 meter ahead of him, then Jami and Rony reach the finishing point at the same time. How long does Jami take to run the 100 meter race?
(A) 24 sec. (B) 21 sec. (C) 20 sec. (D) 20.5 sec (E) None

Topic – 03 : Equation Method

05. At 30mph speed Sakib had 7 min late to reach his office but at 40 mph he was 8 min earlier. Find the distance he had covered?

(A) 20 (B) 30 (C) 40 (D) 50 (E) None

06. A man complete a journey in 10 hours. He travels first half of the journey at the rate of 21 km/hr and second half at the rate of 24 km/hr. Find the total journey in km.

(A) 190 km (B) 210 km (C) 224 km (D) 240 km (E) None

Topic – 04 : Average Speed

পরিসংখ্যানে আমরা কেন্দ্রিকতার পরিমাপ (Measure of Central Tendency) অধ্যায়ে পড়েছি গড় ০৩ (তিন) প্রকার। যথাঃ

- গাণিতিক গড় (Arithmatic Mean)
- জ্যামিতিক গড় (Geometric Mean)
- ছন্দিত গড় (Harmonic Mean)

সাধারণত ঃ কোন বস্তু যখন **Uniform motion** এ চলতে পারেনা তখন ছন্দিত গড় ব্যবহৃত হয়। যেমন মানুষের গতি, গাড়ির গতি, ট্রেন বা স্টিমারের গতি ইত্যাদি। এই অধ্যায়ে ছন্দিত গড়ের অনুকরণে গড় বেগের ধারণা থাকছে।

Average Speed মূলত দুইটি কেইস - এ ভাগ করা যায়।

- For Equal Distance
- For Unequal Distance

Case - 01 : For Equal Distance

Formula : Average Speed = $\frac{2xy}{x+y}$ (Teacher Class এ ব্যাখ্যা দিবেন)

07. A car travels 180 km from A to B at 60 kmh^{-1} & returned back along the same route at 1.5 times speed. Average speed of the round trip is.

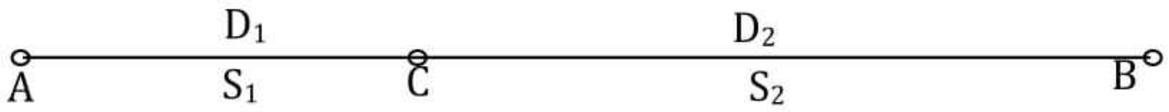
(A) 72 (B) 36 (C) 180 (D) 30 (E) None

08. A car reached from A to B at an average speed of 20 kmh^{-1} & returned back along the same route at 20% faster than usual speed. If the entire trip took exactly 11 hr to complete non stop, Find AB =?

(A) 88.88 (B) 120 (C) 166.33 (D) 176 (E) None

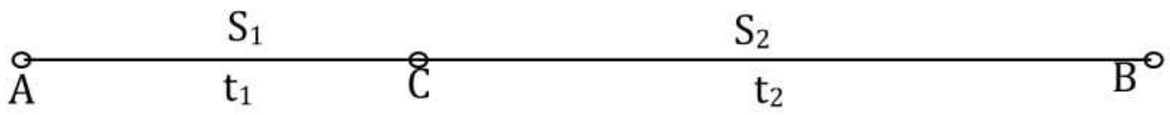
Case – 02 : For Unequal Distance

Section – 01 : When Time isn't given directly



$$\text{Average Speed} = \frac{D}{t} = \frac{D_1 + D_2}{t_1 + t_2} = \frac{D_1 + D_2}{\frac{D_1}{S_1} + \frac{D_2}{S_2}}$$

Section – 02 : When Distance isn't given directly



$$\text{Average Speed} = \frac{D}{t} = \frac{D_1 + D_2}{t_1 + t_2} = \frac{S_1 t_1 + S_2 t_2}{t_1 + t_2}$$

09. Rafa had traveled the first 3 hrs of journey at 60 mph speed & the remaining 5 hrs at 24 mph speed. Find the average speed?

(A) 42 (B) 36 (C) 37.5 (D) 42.5 (E) 48

10. A man had travelled from town A to Town B at an average speed of 50mph in 2hrs. He had covered 65% distance at 65mph and rest at x mph. Find x?

(A) 25 (B) 28 (C) 35 (D) 49 (E) 65

Topic – 05 : Relative Speed

Case - 01 : Two objects in Same Directions

11. A police man spots a mugger from a distance of 200 meters. As the police man starts chasing the mugger, the mugger also starts running. Given that the speed of the mugger is 10 km/h and that of the police man is 12 km/h, how far would have the mugger run before he is caught?

(A) 3 km (B) 4 km (C) 2 km (D) 1 km (E) None

Case - 02 : Two objects in Different Directions

12. Distance between Dhaka and Chittagong is 450 km. Turna Nishita started from Dhaka at 11:30 pm meanwhile Subarna express started from Chittagong at the same time. They meet each other in Comilla, Find the distance between Chittagong & Comilla if the speed of Turna Nishitha and Subarna Express is 60kph & 40kph respectively.

(A) 150 km (B) 180 km (C) 200 km (D) 220 km (E) None

13. Two bikers A and B had started simultaneously in the opposite direction from two points P and Q and arrived at their destinations 16 and 9 hours respectively after their meeting each other. At what speed does the second biker B travel if the first bike had traveled at 120 km/h.

(A) 150 kph (B) 160 kph (C) 200 kph (D) 220 kph (E) None

Teacher's Discussion | **Time and Train**

Time and Train এবং Time and Distance সমগোত্রীয়। ট্রেন রিলেটেড সমস্যার সবচেয়ে বড় বাঁধা হলো ট্রেনের দৈর্ঘ্য। বিষয়টি ক্লিয়ার হওয়া জরুরি। ব্যাংকার্স রিক্রুটমেন্টের জন্য এটি হট টপিকস হলেও পরীক্ষার্থীদের জন্য Time and Distance এর মত ভীতিকর অধ্যায় হিসেবে বিবেচিত। অধ্যায়টি থেকে মিডিয়াম ও হার্ড লেভেলের কমপক্ষে ১-২টি অংক পরীক্ষায় এসে থাকে। পরীক্ষার প্রশ্নপত্রের সাথে সঙ্গতি রেখে ও ক্লাসে পাঠদানের সুবিধা মাথায় রেখে টপিকস/টাইপ অনুসারে (প্রয়োজনীয় ক্ষেত্রে সাব-টাইপসে তথা কেস অনুসারে) নিয়ম ও সংশ্লিষ্ট সমস্যাগুলো দেওয়া হলো।

Discussed Types :

- Average Speed
- Relative Speed

মনে রাখবেনঃ

ট্রেনের অংকে কখনোই দূরত্ব থাকেনা। এক্ষেত্রে দূরত্বের পরিবর্তে ট্রেনের দৈর্ঘ্য বিবেচিত হয়। যেমন একটি ট্রেন যদি কোন মানুষ, গাছ, ল্যাম্পপোস্ট ইত্যাদি অতিক্রম করে যায় তবে এক্ষেত্রে কেবলমাত্র ট্রেনের দৈর্ঘ্য দূরত্ব হিসেবে বিবেচিত হবে কেননা ট্রেনের দৈর্ঘ্যের সামনে মানুষ, গাছ, ল্যাম্পপোস্ট ইত্যাদির দৈর্ঘ্য নগন্য (বর্জনযোগ্য)। তাই প্রশ্নে ট্রেন যাকে অতিক্রম করছে তার দৈর্ঘ্য দেওয়া না থাকলে (কিংবা জানতে না চাওয়া হলে) দূরত্ব হিসেবে ট্রেনের দৈর্ঘ্যই হিসেব করতে হবে।

তবে ট্রেন যদি আরেকটি ট্রেন, প্লাটফর্ম, টানেল, ব্রিজ ইত্যাদি বৃহৎ বস্তু অতিক্রম করে তবে সেক্ষেত্রে দুরত্ব হিসেবে ট্রেনের সাথে উক্ত বস্তুগুলোর দৈর্ঘ্য যোগ হবে। যেমনঃ একটি ট্রেন আরেকটি ট্রেনকে মুখোমুখি ক্রস করে তাহলে সেক্ষেত্রে দুটো ট্রেনের দৈর্ঘ্যের যোগফল দুরত্ব হিসেবে বিবেচিত হবে।

Topic – 01 : Average Speed

14. A train speed of 54 Kh^{-1} passes a platform in 36 sec while it passes a man in 20 sec. Find the length of train.
(A) 150 m (B) 180 m (C) 200 m (D) 220 m (E) 240 m

15. A train 240m long passes a pole in 24 sec. How many second it required to pass a 650 long platform?
(A) 65 sec (B) 89 sec (C) 100 sec (D) 150 sec (E) None

Topic – 02 : Relative Speed

ক্লাসে যেহেতু ইতোমধ্যে আপেক্ষিক গতি আলোচিত হয়েছে, সেহেতু সরাসরি কেস ভিত্তিক সমস্যা সমাধানের দিকে মনোযযোগ দেওয়া যেতে পারে।

Case - 01 : Two objects in Same Directions

15. Two train of equal length running at 46 kph and 36kph. If faster train overtake the slower train in 36 sec. Find the length of trains?
(A) 50 (B) 72 (C) 80 (D) 82 (E) None

16. A jogger running at 9kph alongside a railway truck in 240m ahead of the engine of a 120m long trains running at 45kph in the same direction. In how much time train will pass a jogger?
(A) 50 (B) 72 (C) 80 (D) 82 (E) None

17. A train 125m long passes a man, running at 5 km/hr in the same direction in which the train is going in 10 seconds. The speed of the train is:

(A) 45 (B) 50 (C) 54 (D) 55 (E) 60

✍ Case - 02 : Two objects in Different Directions

18. Two train of equal length running at 60 kph and 90 kph. If the trains cross each other in 48 sec. Find the length of trains?

(A) 1.1 (B) 0.9 (C) 1 (D) 1.3 (E) None

19. Two train running opposite directions cross a man in standing on the platform in 27s and 17s respectively and they cross each other in 23s. The ratio of their speed is?

(A) 1:2 (B) 2:3 (C) 3:2 (D) 2:1 (E) None

20. Distance between Dhaka and Chittagong is 450 km. Turna Nishita started from Dhaka at 11:30 pm meanwhile Subarna express started from Chittagong at the same time. They meet each other in Comilla, Find the distance between Chittagong & Comilla if the speed of Turna Nishitha and Subarna Express is 60kph & 40kph respectively.

(A) 150 km (B) 180 km (C) 200 km (D) 220 km (E) None

Teacher's Discussion — Time and Boat

Time and Boat এবং Time and Distance সমগোত্রীয়। ট্রেন রিলেটেড সমস্যায় যেমন দূরত্ব একটি বাঁধা তেমনি নৌকার সবচেয়ে বড় বাঁধা হলো নৌকার গতি। বিষয়টি ক্লিয়ার হওয়া জরুরি। নৌকা স্রোতের কোন দিকে যাচ্ছে এটা খুব জরুরি। যদি স্রোতের দিকে যায় সেক্ষেত্রে স্রোত ও নৌকার বেগ যোগ হবে। উল্টো দিকে গেলে বিয়োগ হবে। ব্যাংকার্স রিক্রুটমেন্টের জন্য এটি হট টপিকস হলেও পরীক্ষার্থীদের জন্য Time and Distance এর মত এই অধ্যায়টিও ভীতিকর অধ্যায় হিসেবে বিবেচিত। অধ্যায়টি থেকে মিডিয়াম ও হার্ড লেভেলের কমপক্ষে ১-২টি অংক পরীক্ষায় এসে থাকে। পরীক্ষার প্রশ্নপত্রের সাথে সঙ্গতি রেখে ও ক্লাসে পাঠদানের সুবিধা মাথায় রেখে টপিকস/টাইপ অনুসারে (প্রয়োজনীয় ক্ষেত্রে সাব-টাইপসে তথা কেস অনুসারে) নিয়ম ও সংশ্লিষ্ট সমস্যাগুলো দেওয়া হলো।

শিক্ষকের নিকট বিশদ ব্যাখ্যা জেনে নিন ঃ

i) For Downstream = Speed of Boats + Speed of Current

ii) For Up stream = Speed of Boats – Speed of Current

iii) At Still Water = Speed of Boats

21. A man can row at the rate of 4km / hr. in still water. If the time taken to row a certain distance upstream is 3 times as much as to row the same distance downstream, find the speed of the c urrent.

(A) 3.5 km/hr (B) 2.5 km/hr (C) 3 km/hr (D) 2 km/hr. (E) None

22. The speed of a boat in still water is 10 km/hr. If it can travel 26 km downstream and 14 km upstream in the same time, the speed of the stream is:

(A) 2 km/hr. (B) 2.5 km/hr. (C) 3 km/hr. (D) 4 km/hr. (E) None

Students' Work — Time and Distance

1. **Andy lives on 10th floor and Bimal lives on 45th floor. Andy goes up at a rate of 34 floors per minute and Bimal comes down at a rate of 36 floors per minute. At which floor they will meet?**
   A) 27 B) 26 C) 18 D) 32 E) None
2. **The average speed of a train is 20% less on the return journey than on the onward journey. The train halts for an hour at the destination station before starting on the return journey. If the total time taken for the to and fro journey is 46 hrs, covering a distance of 2000 km, the speed of the train on the return journey is:**
   A) 50 km/h B) 40 km/h C) 60 km/h D) 65km/h E) None
3. **A train running at 7/11 of its own speed reached a place in 33 hrs. How much time could be saved if the train runs at its own speed?**
   A) 10 hrs B) 12 hrs C) 8 hrs D) 16 hrs E) None
4. **A train traveling at 96 km/h completely crosses another train having half its length and traveling in the opposite direction at 84 km/h in 6 s. It also passes a railway platform in 45 s. The length of the platform is:**
   A) 400 m B) 500 m C) 660 m D) 350 m E) None
5. **The train traveling at 50 km/h overtakes a motorbike traveling at 32 km/h in 80 s. What is the length of the train in meters?**
   A) 400 B) 800 C) 777 D) 111 E) None
6. **A runs 3 2/3 times as fast as B) If A gives B a start of 80 m. How far must the winning post be from the starting point of A so that A and B reach it at the same time?**
   A) 200 m B) 110 m C) 150 m D) 180 m E) None
7. **Two places A and B are at a certain distance. Ramu started from A towards B at a speed of 40 kmph. After 2 hours Raju started from B towards A at a speed of 60 kmph. If they meet at a place C then ratio of ratio of time taken by Raju to Ramu to reach Place C is 2:3. Then what is the distance between A and B?**
   A) 300 Km B) 400 Km C) 480 Km D) 600 Km E) None
8. **Two Cars started at same time, same place and towards same direction. First Car goes at uniform speed of 12Km/hr. Second Car goes at speed of 4 Km/hr in first hour and increases it speed by 1 Km/hr for every hour. Then what is the distance traveled by car B when the both the Cars meet for the first time?**
   A) 196 Km B) 198 Km C) 200 Km D) 204 Km E) None
9. **A man traveled 100 km by Bike in 2 hours. He then traveled in Bus for 8 hrs and then Train in 9 hrs. Ratio of Speeds of Bus to Train is 4:5. If speed of train is 4/5 of Bike speed then the entire journey covered by him in Km is?**
   A) 516 Km B) 616 Km C) 716 Km D) 816 Km E) None
10. **Car A leaves Delhi at a certain time, after 5 hours Car B leaves Delhi in the same direction as of A. Speed of Car A is 20Km/hr and Speed of Car B is 40Km/hr. In how much time Car B will be 20Km ahead of Car A?**
    A) 5 Hours B) 6 Hours C) 8 Hours D) 11 Hours E) None
11. **A police saw a Thief at a distance of 2km. When Police started chasing him Thief also started running. If the ratio of Speeds of Police to Thief is 5:4. Then thief was caught at a certain distance then how many Kms did police run to catch the Thief?**
    A) 5 Km B) 6 Km C) 8 Km D) 10 Km E) None

12. If a Car runs at 45Km/hr it reaches its destination by 10 min late. If it runs at 60Km/hr it is late by 4min. Then what is the correct time for the journey?

A) 12 min B) 14 min C) 16 min D) 18 min E) None

13. Two Vans start from a place with a speed of 50 kmph at an interval of 12 minutes. What is the speed of a car coming from the opposite direction towards the place if the car meets the vans at an interval of 10 minutes?

A) 13 kmph B) 10 kmph C) 14 kmph D) 16 kmph E) None

14. A car travels from a place A to B in 7 hour. It covers half the distance at 30 kmph and the remaining distance at 40 kmph, what is the total distance between A and B?

A) 120 Km B) 250 Km C) 240 Km D) 150 Km E) None

15. Two persons A and B start from the opposite ends of a 450 km straight track and run to and from between the two ends. The speed of the first person is 25 m/s and the speed of other is 35 m/s. They continue their motion for 10 hours. How many times did they pass each other?

A) 1 B) 4 C) 3 D) 2 E) None

16. A travel bus normally reaches its destination at 60 kmph in 20 hours. Find the speed of that travel bus at which it travels to reduce the time by 5 hours?

A) 80 kmph B) 60 kmph C) 50 kmph D) 40 kmph E) None

17. Anu and Purvi are running on a circular track of length 500m. The Speed of Anu is 40 m/s and that of Purvi is 30 m/s. They start from the same point at the same time in the same direction. When will they meet again for the first time?

A) 25 s B) 23 s C) 50 s D) 48 s E) None

18. A boat running upstream takes 9 hours 48 minutes to cover a certain distance, while it takes 7 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) 5:2 B) 7:4 C) 6:1 D) 8:3 E) 2:5

19. A boat whose speed in 20 km/hr in still water goes 40 km downstream and comes back in a total of 5 hours. The approx. speed of the stream (in km/hr) is:

A)6 km/hr B)9 km/hr C)12 km/hr D)16 km/hr E) 18 km/hr

20. A boat running downstream covers a distance of 40 km in 5 hrs and for covering the same distance upstream it takes 10 hrs. What is the speed of the stream?

A)5 km/hr B)2 km/hr C)6 km/hr D)4 km/hr E) 3 km/hr

21. Two trains of length 100 meter and 125 meter are travelling at a speed of 45 km/hr and 60km/hr respectively in same direction. In what time they will completely cross each other.

A) 52 sec B) 54 sec C) 56 sec D) 58 sec E) None

22. Two trains are travelling in same direction with 60 km/hr and 75 km/hr respectively. The faster train crosses a man sitting in the slower train in 30 sec. find the length of faster train.

A) 100 meter B) 125 meter C) 140 meter D) 150 meter E) None

23. Two trains of length 120 meter and 150 meter crosses a stationary man in 10 and 15 seconds respectively. In what time they will cross each other when they are moving in same direction.

A)120 sec B) 125 sec C) 135 sec D) 140 sec E) None

24. A train travelling with 54 km/hr takes 20 second to cross a bridge. Another train 70 meter shorter crosses the same bridge at 36 km/hr. Find the time taken by the second train to cross the bridge.

A) 23 sec B) 24 sec C) 25 sec D) 26 sec E) None

25. Two trains are moving in opposite direction having speed in the ratio 5:7. First train crosses a pole in 12 second and second train crosses the same pole n 15 second. Find the time in which they can cross each other completely.

A) 55/4 sec B) 53/4 sec C) 57/4 sec D) 59/4 sec E) None

26. The distance of the School and house of Suresh is 80km. One day he was late by 1 hour than the normal time to leave for the college, so he increased his speed by 4km/h and thus he reached to college at the normal time. What is the changed speed of Suresh?

A) 28 kmph B) 25 kmph C) 20 kmph D) 24 kmph E) None

27. Anita goes to College at 20 km/h and reaches college 4 minutes late. Next time she goes at 25 km/h and reaches the college 2 minutes earlier than the scheduled time. What is the distance of her school?

A) 16 km B) 12 km C) 15 km D) 10 km E) None

28. Two places R and S are 800 km apart from each other. Two persons start from R towards S at an interval of 2 hours. Whereas A leaves R for S before B) The speeds of A and B are 40 kmph and 60 kmph respectively. B overtakes A at M, which is on the way from R to S. What is the ratio of time taken by A and B to meet at M?

A) 1:3 B) 1:2 C) 1:4 D) 3:2 E) None

29. The driver of an ambulance sees a college bus 40 m ahead of him after 20 seconds, the college bus is 60 meter behind. If the speed of the ambulance is 30 km/h, what is the speed of the college bus?

A) 10 kmph B) 12 kmph C) 15 kmph D) 22 kmph E) None

30. A man takes 5 hours 45 min in walking to a certain place and riding back. He would have gained 2 hours by riding both ways. The time he would take to walk both ways is

A) 11 hrs B) 8 hrs 45 min C) 7 hrs 45 min D) 9 hrs 20 min E) None

31. A person crosses a 600 metre long street in 5 minutes. What is his speed in km per hour?

A) 8.2 B) 4.2 C) 6.1 D) 7.2

32. Excluding stoppages, the speed of a bus is 54 kmph and including stoppages, it is 45kmph. For how many minutes does the bus stop per hour?

A) 12 B) 11 C) 10 D) 9 E) None

33. A man covered a certain distance at some speed. If he had moved 3 kmph faster, he would have taken 40 minutes less. If he had moved 2 kmph slower, he would have taken 40 minutes more. What is the distance in km?

A) 36 B) 38 C) 40 D) 42 E) None

34. A and B walk around a circular track. A and B walk at a speed of 2 rounds per hour and 3 rounds per hour respectively. If they start at 8 A)m. from the same point in opposite directions, how many times shall they cross each other before 9.30 A)m.?

A) 5 B) 6 C) 7 D) 8 E) None

35. Two boys starts from the same place walking at the rate of 5 kmph and 5.5 kmph respectively in the same direction. What time will they take to be 8.5 km apart?

A) 17 hr B) 14 hr C) 12 hr D) 19 hr E) None

36. In covering a distance of 30 km, Arun takes 2 hours more than Anil. If Arun doubles his speed, then he would take 1 hour less than Anil. What is Arun's speed?

A) 8 kmph B) 5 kmph C) 4 kmph D) 7 kmph E) None

37. A man travelled a distance of 61 km in 9 hours. He travelled partly on foot at 4 km/hr and partly on bicycle at 9 km/hr. What is the distance travelled on foot?

A) 12 km B) 14 km C) 16 km D) 18 km E) None

38. A man goes to his office from his house at a speed of 3 km/hr and returns at a speed of 2 km/hr. If he takes 5 hours in going and coming, what is the distance between his house and office?

A) 3 km B) 4 km C) 5 km D) 6 km E) None

39. An athlete runs 200 metres race in 24 seconds. What is his speed?

A) 20 km/hr B) 25 km/hr C) 27.5 km/hr D) 30 km/hr E) None

40. A train is moving at the speed of 80 km/hr. What is its speed in metres per second?

A) $22\frac{2}{9}$ m/s B) 22 m/s C) $21\frac{1}{9}$ m/sec D) 21 m/s E) None

41. A man walking at the rate of 5 km/hr crosses a bridge in 15 minutes. What is the length of the bridge (in metres)?

A) 1250 B) 1280 C) 1320 D) 1340 E) None

42. A person travels from A to B at a speed of 40 km/hr and returns by increasing his speed by 50%. What is his average speed for both the trips?

A) 60 km/hr B) 56 km/hr C) 52 km/hr D) 48 km/hr E) None

43. A man in a train notices that he can count 21 telephone posts in one minute. If they are known to be 50 metres apart, at what speed is the train travelling?

A) 61 km/hr B) 56 km/hr C) 63 km/hr D) 60 km/hr E) None

44. A truck covers a distance of 550 metres in 1 minute whereas a train covers a distance of 33 kms in 45 minutes. What is the ratio of their speed?

A) 2:1 B) 1:2 C) 4:3 D) 3:4 E) None

45. A train is running at a speed of 4040 km/hr and it crosses a post in 1818 seconds. What is the length of the train?

A) 190 metres B) 160 metres C) 200 metres D) 120 metres E) None

46. A train, 130 metres long travels at a speed of 45 km/hr crosses a bridge in 30seconds. The length of the bridge is

A) 270 metres B) 245 metres C) 235 metres D) 220 metres E) None

47. A train having a length of 240 metre passes a post in 24 seconds. How long will it take to pass a platform having a length of 650 metre?

A) 120 seconds B) 99 seconds C) 89 seconds D) 80 seconds E) None

48. A train 360 metre long runs with a speed of 45 km/hr. What time will it take to pass a platform of 140 metre long?

A) 38 seconds B) 35 seconds C) 44 seconds D) 40 seconds E) None

49. A jogger is running at 9 kmph alongside a railway track in 240 metres ahead of the engine of a 120 metres long train. The train is running at 45 kmph in the same direction. How much time does it take for the train to pass the jogger?

A) 46 seconds B) 36 seconds C) 18 seconds D) 22 seconds E) None

50. Two trains of equal length are running on parallel lines in the same direction at 46km/hr and 36 km/hr. If the faster train passes the slower train in 36 seconds, what is the length of each train?

A) 88 metre B) 70 metre C) 62 metre D) 50 metre E) None

51. Two trains having length of 140 metre and 160 metre long run at the speed of 60 km/hr and 40 km/hr respectively in opposite directions (on parallel tracks). The time which they take to cross each other, is

A) 10.8 seconds B) 12 seconds C) 9.8 seconds D) 8 seconds E) None

52. A train passes a platform in 36 seconds. The same train passes a man standing on the platform in 20 seconds. If the speed of the train is 54 km/hr, The length of the platform is

A) None B) 280 metre C) 240 metre D) 200 metre E) All

53. Two trains having equal lengths, take 10 seconds and 15 seconds respectively to cross a post. If the length of each train is 120 metres, in what time (in seconds) will they cross each other when travelling in opposite direction?

A) 10 B) 25 C) 12 D) 20 E) None

54. Two trains, one from P to Q and the other from Q to P, start simultaneously. After they meet, the trains reach their destinations after 9 hours and 16 hours respectively. The ratio of their speeds is

A) 2:3 B) 2:1 C) 4:3 D) 3:2 E) None

55. A train runs at the speed of 72 kmph and crosses a 250 metre long platform in 26 seconds. What is the length of the train?

A) 270 metre B) 210 metre C) 340 metre D) 130 metre E) None

56. A train overtakes two persons who are walking in the same direction to that of the train at 2 kmph and 4 kmph and passes them completely in 9 and 10 seconds respectively. What is the length of the train?

A) 62 metre B) 54 metre C) 50 metre D) 55 metre E) None

57. A train having a length of 270 metre is running at the speed of 120 kmph. It crosses another train running in opposite direction at the speed of 80 kmph in 9 seconds. What is the length of the other train?

A) 320 metre B) 190 metre C) 210 metre D) 230 metre E) None

58. A train, having a length of 110 metre is running at a speed of 60 kmph. In what time, it will pass a man who is running at 6 kmph in the direction opposite to that of the train

A) 10 seconds B) 8 seconds C) 6 seconds D) 4 seconds E) None

59. A train crosses a post in 15 seconds and a platform 100 metre long in 25 seconds. Its length is –

A) 150 metre B) 300 metre C) 400 metre D) 180 metre E) None

60. Two train each 500 metre long, are running in opposite directions on parallel tracks. If their speeds are 45 km/hr and 30 km/hr respectively, the time taken by the slower train to pass the driver of the faster one is

A) 50 seconds B) 58 seconds C) 24 seconds D) 22 seconds E) None

61. Two trains are running in opposite directions in the same d. The length of each train is 120 metre. If they cross each other in 12 seconds, the speed of each train (in km/hr) is

A) 42 B) 36 C) 28 D) 20 E) None

62. A train 108 metre long is moving at a speed of 50 km/hr. It crosses a train 112 metre long coming from opposite direction in 6 seconds. What is the speed of the second train?

A) 82 kmph B) 76 kmph C) 44 kmph D) 58 kmph E) None

63. How many seconds will a 500 metre long train moving with a speed of 63 km/hr, take to cross a man walking with a speed of 3 km/hr in the direction of the train?

A) 42 B) 50 C) 30 D) 28 E) None

64. A man's speed with the current is 15 km/hr and the speed of the current is 2.5 km/hr. The man's speed against the current is:

A) 8.5 km/hr B) 10 km/hr. C) 12.5 km/hr D) 9 km/hr E) None

65. In one hour, a boat goes 14 km/hr along the stream and 8 km/hr against the stream. The speed of the boat in still water (in km/hr) is:

A) 12 km/hr B) 11 km/hr C) 10 km/hr D) 8 km/hr E) None

66. Speed of a boat in standing water is 14 kmph and the speed of the stream is 1.2 kmph. A man rows to a place at a distance of 4864 km and comes back to the starting point. The total time taken by him is:

A) 700 hours B) 350 hours C) 1400 hours D) 1010 hours E) None

67. The speed of a boat in still water in 22 km/hr and the rate of current is 4 km/hr. The distance travelled downstream in 24 minutes is:

A) 9.4 km B) 10.2 km C) 10.4 km D) 9.2 km E) None

68. A boat can travel with a speed of 22 km/hr in still water. If the speed of the stream is 5 km/hr, find the time taken by the boat to go 54 km downstream

A) 5 hours B) 4 hours C) 3 hours D) 2 hours E) None

69. A man takes twice as long to row a distance against the stream as to row the same distance in favour of the stream. The ratio of the speed of the boat (in still water) and the stream is:

A) 3 : 1 B) 1 : 3 C) 1 : 2 D) 2 : 1 E) None

70. Two pipes A and B can fill a tank in 10 hrs and 40 hrs respectively. If both the pipes are opened simultaneously, how much time will be taken to fill the tank?

A) 8 hours B) 6 hours C) 4 hours D) 2 hours E) None

71. A boatman can row 96 km downstream in 8 hr. If the speed of the current is 4 km/hr, then find in what time will be able to cover 8 km upstream?

A) 6 hr B) 2 hr C) 4 hr D) 1 hr E) None

72. If a man's rate with the current is 15 km/hr and the rate of the current is 11⁄2 km/hr, then his rate against the current is

A) 12 km/hr B) 10 km/hr C) 10.5 km/hr D) 12.5 km/hr E) None

73. The speed of the boat in still water in 12 kmph. It can travel downstream through 45 kms in 3 hrs. In what time would it cover the same distance upstream?

A) 3 hours B) 7 hours C) 3 hours D) 5 hours E) None

74. A boat goes 8 km upstream in 24 minutes. The speed of stream is 4 km/hr. The speed of boat in still water is:

A) 25 km/hr B) 26 km/hr C) 22 km/hr D) 24 km/hr E) None

75. The speed of a boat in still water is 25 kmph. If it can travel 10 km upstream in 1 hr, what time it would take to travel the same distance downstream?

A) 22 minutes B) 30 minutes C) 40 minutes D) 15 minutes E) None

76. A boat moves downstream at the rate of one km in 5 minutes and upstream at the rate of 4 km an hour. What is the velocity of the current?

A) 4 km/hr B) 2 km/hr C) 3 km/hr D) 1 km/hr E) None

77. The speed of a boat in still water is 8 kmph. If it can travel 1 km upstream in 1 hr, what time it would take to travel the same distance downstream?

A) 1 minute B) 2 minutes C) 3 minutes D) 4 minutes E) None

Solution | Time & Distance

1. Total floors between Andy & Fimal = 45 –10 = 35 floors
Relative speed = 34 + 36 = 70 floor/min

Time taken by them to meet = $\frac{\text{Total floors}}{\text{Relative Speed}} = \frac{35}{70} = \frac{1}{2}$ min

Andy travels in $\frac{1}{2}$ min = $\frac{1}{2} \times 34 = 17$ floors

Floor at which Andy & Bimal will meet = $10 + 17 = 27^{th}$ floors ∴ **Ans. A**

2. Let the speed of train on onward journey be x km/h
then, speed of train on return journey = 0.8x km/h

ATQ, Total Time = 46 – 1 = 45, = $\frac{1000}{x} + \frac{1000}{0.8x} = 45$, x = 50 km/h

Speed of train on return journey = 0.8×50 = 40 km/hr ∴ **Ans. B**

3. Distance is same. Then, $\frac{S_2}{S_1} = \frac{T_1}{T_2} = \frac{7}{11} = \frac{t_1}{33} \Rightarrow T_1 = 21$ hour

Total time saved = 33 – 21 = 12 hours ∴ **Ans. B**

4. Let the length of the train X m

Then length of another train = $\frac{x}{2}$ m

ATQ, $\frac{x + \frac{x}{2}}{(84 + 96) \times \frac{5}{18}} = 6$, x = 200 m

Let the length of platform be y m = $\frac{200 + y}{96 \times \frac{5}{18}} = 45$, y = 1000 m ∴ **Ans. E**

5. Since both are moving in same direction so their speed must be subtracted.

As we know, speed = $\frac{\text{distance}}{\text{time}}$ (where distance will be the train of the length)

Length of train = $(50 - 32) \times \frac{5}{18} \times 80 = 400$ m ∴ **Ans. A**

6. Let the distance of winning post from starting point of A be x m
∴ Distance traveled by A = x m
Distance travelled by B = x – 80m

And, Speed of A = $3\frac{2}{3}$ speed of B

$\frac{\text{Speed of A}}{\text{Speed of B}} = \frac{11}{3}$ Time is same for Both A & B ∴ $\frac{x}{x-80} = \frac{11}{3} = 110$ ∴ **Ans. B**

7. $40t_1 + 60t_2 = d \Rightarrow t_1/t_2 = 3/2 \Rightarrow t_1 - t_2 = 2$ Solving d = 480 Km ∴ **Ans. C**

8. $12 \times x = x/2[2 \times 4 + (x - 1) \times 1]$; x = 17; D = $17 \times 12 = 204$ ∴ **Ans. D**

9. Speed of train = 50; Bus = 32; Train = 40 Distance = $100 + 32 \times 8 + 40 \times 9 = 716$ ∴ **Ans. C**

10. $20 = 40 \times (t - 5) - 20 \times t$; T = 11; $11 \times 5 = 6$ ∴ **Ans. B**

11. $2 + x/5 = x/4$; x = 8 Police = 8 + 2 = 10 ∴ **Ans. D**

12. $45(t + 10) = 60(t + 4)$; $t = 14$ ∴ **Ans. B**

13. $50 \times 12/60 = 10/60 \times (50 + x)$; $600 = 500 + 10x$; $x = 10$ kmph ∴ **Ans. B**

14. Total Distance = x; $(x/2 \times 30) + (x/2 \times 40) = 7$; $x = 240$ ∴ **Ans. C**

15. First person speed = 25 m/s × 18/5 = 90 kmph Second person speed = 35 m/s × 18/5 = 126 kmph
First person covers 90 × 10 = 900km; 900/450 = 2 ∴ **Ans. D**

16. $60 \times 20 = x \times 15$; $x = 80$ kmph ∴ **Ans. A**

17. Time = Distance/Relative Speed = 500/10 = 50 s ∴ **Ans. C**

18. Distance covered upstream in 9hrs 48 min = Distance covered downstream in 7hrs
$(x - y)\ 49/5 = (x + y)7$; $x/y = 6/1$ ∴ $x : y = 6:1$ ∴ **Ans. C**

19. Let the speed of the stream be x km/hr. Then, Speed downstream = (20 + x) km/hr,
Speed upstream = (20 – x) km/hr. So, $40/20 + x + 40/20 - x = 5$ $x = 9$ approx ∴ **Ans. B**

20. Downstream speed = 40/5 = 8 km/hr Upstream speed = 40/10 = 4 km/hr
So speed of stream = 1/2 × (8 – 4) ∴ **Ans. D**

21. $225 = (60 - 45) \times 5/18 \times T$ ∴ **Ans. B**

22. $L = 15 \times 5/18 \times 30 = 125$ meter ∴ **Ans. B**

23. $120 = a \times 10$, a = 12 m/sec (speed of first train) $150 = b \times 15$, b = 10 m/sec (speed of second train)
$270 = (2) \times T$, T = 135 seconds ∴ **Ans. C**

24. Let L and B are length of train and bridge respectively.
$L + B = 54 \times 5/18 \times 20 = 300$ meter $L + B - 70 = 36 \times 5/18 \times t = 230$, se we get t = 23 sec ∴ **Ans. A**

25. Let the length of first train and second train be a and b meter. Then
$a = 5x \times 12 = 60x$ and $b = 7x \times 15 = 105x$
They are moving in opposite direction, $165x = (12x) \times T$ So, T = 165/12 = 55/4 sec ∴ **Ans. A**

26. $80/x - 80/(x + 4) = 1$ => $x(x + 20) - 16(x + 20) = 0$ => x = 16kmph Increased speed = 20 kmph ∴ **Ans. C**

27. $20 \times 25/(25 - 20) \times 6/60 = 10$. ∴ **Ans. D**

28. Time taken by B to reach at M = 4h Time taken by A to reach at M = 6h. Ratio = 6 : 4 = 3 : 2 ∴ **Ans. D**

29. Relative Speed = (Total distance)/total time = (60 + 40) /20 = 5 m/s = (5 × 18)/5 = 18 kmph
Relative Speed = (speed of ambulance – speed of College bus)
Speed of College bus = speed of ambulance – relative speed. = 30 – 18 = 12 kmph. ∴ **Ans. B**

30. Given that time taken for riding both ways will be 2 hours lesser than the time needed for waking one way and riding back. Therefore, time needed for riding one way = time needed for waking one way – 2 hours
Given that time taken in walking one way and riding back = 5 hours 45 min
Hence, the time he would take to walk both ways = 5 hours 45 min + 2 hours = 7 hours 45 min ∴ **Ans. C**

31. Distance= 600 metre = 0.6 km Time = 5 minutes = $\frac{1}{12}$ hour Speed = $\frac{\text{distance}}{\text{time}} = \frac{0.6}{\left(\frac{1}{12}\right)} = 7.2$ km/hr ∴ **Ans. D**

32. Speed of the bus excluding stoppages =54 kmph Speed of the bus including stoppages = 45 kmph
Loss in speed when including stoppages = 54 − 45 = 9 kmph
⇒ In 11 hour, bus covers 9 km less due to stoppages. Hence, time in which the bus stops per hour = Time taken to cover 9 km = $\frac{\text{distance}}{\text{speed}} = \frac{9}{54}$ hour = $\frac{1}{6}$ hour = $\frac{60}{6}$ min = 10 min ∴ **Ans. C**

33. Speed = $\frac{2v_1v_2}{v_1 - v_2} = \frac{2 \times 3 \times 2}{3 - 2} = 12$ km/hr

Distance = $vt_1\left(1 + \frac{v}{v_1}\right) = 12 \times \frac{40}{60}\left(1 + \frac{12}{3}\right) = 40$ km ∴ **Ans. C**

34. Relative speed = Speed of A + Speed of B (∴ they walk in opposite directions) = 2 + 3 = 5 rounds per hour
Therefore, they cross each other 5 times in 1 hour and 2 times in 12 hour
Time duration from 8 a.m. to 9.30 a.m. = 1.5 hour
Hence they cross each other 7 times before 9.30 a.m. **∴ Ans. C**

35. relative speed = 5.5 – 5 = 0.5 kmph (because they walk in the same direction)
distance = 8.5 km
$\text{time} = \frac{\text{distance}}{\text{speed}} = \frac{8.5}{0.5} = 17 \text{ hr}$ **∴ Ans. A**

36. If Arun doubles his speed, he needs 3 hour less. Double speed means half time. Hence, half of the time required by Arun to cover 30 km = 3 hour
i.e., Time required by Arun to cover 30 km = 6 hour
$\text{Arun's speed} = \frac{30}{6} = 5 \text{ kmph}$ **∴ Ans. B**

37. Let the time in which he travelled on foot = x hr
Then the time in which he travelled on bicycle = (9 − x) hr
distance = speed × time ⇒ 4x + 9(9 − x) = 61 ⇒ 4x + 81 − 9x = 61 ⇒ 5x = 20 ⇒ x = 4
Distance travelled on foot = 4x = 4 × 4 = 16 km **∴ Ans. C**

38. $\text{Average speed} = \frac{2 \times 3 \times 2}{2 + 3} = \frac{12}{5} \text{ km/hr}$

Total time taken = 5 hours Distance travelled $= \frac{12}{5} \times 5 = 12 \text{ km}$

Therefore, distance between his house and office $= \frac{12}{2} = 6 \text{ km}$ **∴ Ans. D**

39. $\text{speed} = \frac{\text{distance}}{\text{time}} = \frac{200}{24} \text{ m/s} = \frac{200}{24} \times \frac{18}{5} \text{ km/hr} = \frac{40 \times 3}{4} \text{ km/hr} = 30 \text{ km/hr}$ **∴ Ans. D**

40. $\text{speed} = 80 \text{ km/hr} = 80 \times \frac{5}{18} \text{ m/s} = 40 \times \frac{5}{9} = \frac{200}{9} = 22\frac{2}{9} \text{ m/s}$ **∴ Ans. A**

41. speed = 5 km/hr time = 15 minutes $= \frac{1}{4}$ hour

Length of the bridge = Distance travelled by the man in 15 minutes $= 5 \times \frac{1}{4} \text{ km} = 5 \times \frac{1}{4} \times 1000 \text{ metre}$
$= 1250 \text{ metre}$ **∴ Ans. A**

42. Speed from A to B = 40 km/hr
Speed from B to A = 40 + 20 = 60 km/hr
$\text{Average Speed} = \frac{2 \times 40 \times 60}{40 + 60} = 48 \text{ km/hr}$ **∴ Ans. D**

43. The man can count 21 telephone posts in one minute.
Number of gaps between 21 posts is 20 and adjacent posts are 50 metres apart.
It means 20 × 50 = 1000 metres are covered in 1 minute.
distance =1000 m = 1 km. time = 1 min $= \frac{1}{60}$ hr $\text{speed} = \frac{1}{\left(\frac{1}{60}\right)} = 60 \text{ km/hr}$ **∴ Ans. D**

44. Speed of the truck = 550 metres/min Speed of the train $= \frac{33}{45} \text{ km/min} = \frac{33000}{45} \text{ metres/min}$

Speed of the truck : speed of the train $= 550 : \frac{33000}{45} = 55 : \frac{3300}{45} = 5 : \frac{300}{45} = 1 : \frac{60}{45} = 1 : \frac{4}{3} = 3 : 4$ **∴ Ans. D**

45. Speed = 40 km/hr = $40 \times \frac{5}{18} \times \frac{100}{9}$ m/s Time = 18 seconds

Distance Covered = $\frac{100}{9} \times 18 = 200$ m

Therefore, length of the train = 200 m ∴ **Ans. C**

46. Speed = 45 km/hr = $45 \times \frac{5}{18}$ m/s = 12.5 m/s Time = 30s.

Distance travelled = $12.5 \times 30 = 375$ m Length of the bridge = $375 - 130 = 245$ m ∴ **Ans. B**

47. Speed of the train = $\frac{240}{24}$ = 10m/s Required time = $\frac{240 + 650}{10}$ = 89 seconds ∴ **Ans. C**

48. Speed = 45 km/hr = $45 \times \frac{5}{18} = \frac{25}{2}$ m/s

Distance travelled = Length of the train + Length of the platform = 360 + 140 = 500 metre

Time taken to cross the platform = $\frac{500}{\left(\frac{25}{2}\right)}$ = 40 seconds ∴ **Ans. D**

49. Distance to be covered = (240 + 120) = 360 m Relative speed = (45 − 9) = 36 km/hr = $36 \times \frac{5}{18}$ = 10 m/s

Required time = $\frac{360}{10}$ = 36 seconds ∴ **Ans. B**

50. Let length of each train = x metre

Total distance covered while passing the slower train = (x + x) = 2x metre

Relative speed = (46 − 36) = 10 km/hr = $10 \times \frac{5}{18} = \frac{50}{18}$ m/s

Time = 36 seconds. $\frac{2x}{36} = \frac{50}{18} \Rightarrow x = 50$ ∴ **Ans.**

51. Distance = (140 + 160) = 300 m = 0.3 km

Relative speed = (60 + 40) = 100 km/hr

Required time = $\frac{0.3}{100}$ hr = $\frac{0.3}{100} \times 3600$ seconds = 10.8 seconds ∴ **Ans. A**

52. The train can cover a distance equal to its length in 20 seconds.

Therefore, additional (36 − 20) = 16 seconds was taken to cross the platform.

Hence, length of the platform = $16 \times 54 \times \frac{5}{18} = 240$ metre ∴ **Ans. C**

53. Speed of first train = $\frac{120}{10}$ = 12 m/s Speed of second train = $\frac{120}{15}$ = 8 m/s

If they travel in opposite direction, relative speed = 12 + 8 = 20 m/s

Distance covered = 120 + 120 = 240 metres Time = $\frac{240}{20}$ = 12 seconds ∴ **Ans. C**

54. Required Ratio = $\sqrt{16} : \sqrt{9} = 4 : 3$ ∴ **Ans. C**

55. Speed = 72 kmph = $72 \times \frac{5}{18}$ = 20 m/s Let length of the train = x metre Distance covered = 250 + x

Time = 26s $\frac{250 + x}{26}$ = 20; 250 + x = 26 × 20 = 520; x = 520 − 250 = 270 ∴ **Ans. A**

56. Let speed of the train be v kmph

$(v - 2) : (v - 4) = 10 : 9$ ($\because$ speed and time are inversely proportional) $\Rightarrow 9v - 18 = 10v - 40 \Rightarrow v = 22$

Length of the train $= (22 - 2) \times \frac{5}{18} \times 9 = 50$ metre $\therefore$ **Ans. C**

57. Relative speed $= (120 + 80) = 200 = 200 \times \frac{5}{18} = \frac{500}{9}$ m/s

Time = 9 seconds Distance covered $= \frac{500}{9} \times 9 = 500$ metre

Length of other train $= (500 - 270) = 230$ metre $\therefore$ **Ans. D**

58. Distance =110metre

Since train and man move in opposite directions, relative speed $= (60 + 6) = 66 = 66 \times \frac{5}{18}$ m/s $= \frac{110}{6}$ m/s

Time $= \frac{110}{\left(\frac{110}{6}\right)} = 6$ seconds $\therefore$ **Ans. C**

59. Let length of the train be x meter x meter

$x : (x + 100) = 15 : 25 \Rightarrow x : (x + 100) = 3 : 5 \Rightarrow 5x = 3x + 300 \Rightarrow x = 150$ $\therefore$ **Ans. A**

60. Relative speed $= (45 + 30) = 75$ km/hr $= 75 \times \frac{5}{18} = \frac{125}{6}$ m/s

We are calculating the time taken by the slower train to pass the driver of the faster one.

Hence, distance = length of the slower train = 500 meter Time $= \frac{500}{\left(\frac{125}{6}\right)} = 24$ seconds $\therefore$ **Ans. C**

61. Distance covered $= (120 + 120) = 240$ meter Time = 12 = 12 seconds

Relative speed $= \frac{240}{12} = 20$ m/s $= 20 \times \frac{18}{5} = 72$ km/hr

Relative speed in this case is the sum of the speeds of the trains and each train has same speed,

speed of each train $= \frac{72}{2} = 36$ km/hr $\therefore$ **Ans. B**

62. Distance covered $= (108 + 112) = 220$ meter Time = 6 seconds

Relative speed $= \frac{220}{6} = \frac{110}{3}$ m/s $= \frac{110}{3} \times \frac{18}{5} = 132$ km/hr

$\Rightarrow 50 +$ Speed of second train $= 132$ km/hr $\Rightarrow$ Speed of second train $= (132 - 50) = 82$ km/hr $\therefore$ **Ans. A**

63. Distance = 500 meter Relative speed $= (63 - 3) = 60$ km/hr $= 60 \times \frac{5}{18} = \frac{50}{3}$ m/s

Time taken $= \frac{500}{\left(\frac{50}{3}\right)} = 30$ seconds $\therefore$ **Ans. C**

64. Man's speed with the current = 15 km/hr

$\Rightarrow$ speed of the man + speed of the current = 15 km/hr

speed of the current is 2.5 km/hr

Hence, speed of the man = 15 – 2.5 = 12.5 km/hr

man's speed against the current = speed of the man – speed of the current = 12.5 – 2.5 = 10 km/hr $\therefore$ **Ans. B**

65. Let the speed downstream be a km/hr and the speed upstream be b km/hr,

then Speed in still water $= \frac{1}{2}(a + b)$ km/hr $= \frac{1}{2}(14 + 8) = 11$ $\therefore$ **Ans. B**

66. Speed downstream = (14 + 1.2) = 15.2 kmph Speed upstream = (14 – 1.2) = 12.8 kmph

Total time taken = $\frac{4864}{15.2} + \frac{4864}{12.8} = 320 + 380 = 700$ hours ∴ **Ans. A**

67. Speed downstream = (22 + 4) = 26 kmph Time = 24 minutes = $\frac{24}{60}$ hour = $\frac{2}{5}$ hour

Distance travelled = Time × speed = $\frac{2}{5} \times 26 = 10.4$ km ∴ **Ans. C**

68. Speed of the boat in still water = 22 km/hr Speed of the stream = 5 km/hr

Speed downstream = (22 + 5) = 27 km/hr Distance travelled downstream = 54 km

Time taken = $\frac{\text{distnace}}{\text{speed}} = \frac{54}{27} = 2$ hours ∴ **Ans. D**

69. Let speed upstream = x Then, speed downstream = 2x

Speed in still water = $\frac{2x + x}{2} = \frac{3x}{2}$ Speed of the stream= $\frac{2x - x}{2} = \frac{x}{2}$

Speed in still water: Speed of the stream = $\frac{3x}{2} : \frac{x}{2} = 3:1$ ∴ **Ans. A**

70. Pipe A can fill $\frac{1}{10}$ of the tank 1 hr Pipe B can fill $\frac{1}{40}$ of the tank in 1 hr

Pipe A and B together can fill $\frac{1}{10} + \frac{1}{40} = \frac{1}{8}$ of the tank in 1 hr

i.e., Pipe A and B together can fill the tank in 8 hours ∴ **Ans. A**

71. Speed downstream = $\frac{96}{8} = 12$ kmph Speed of current = 4 km/hr

Speed of the boatman in still water = 12 – 4 = 8 kmph Speed upstream = 8 – 4 = 4 kmph

Time taken to cover 8 km upstream = $\frac{8}{4} = 2$ hours ∴ **Ans. B**

72. Speed downstream = 15 km/hr Rate of the current = $1\frac{1}{2}$ km/hr

Speed in still water = $15 - 1\frac{1}{2} = 13\frac{1}{2}$ km/hr Rate against the current = $13\frac{1}{2}$ km/hr – $1\frac{1}{2}$ = 12 km/hr ∴ **Ans. A**

73. Speed of the boat in still water = 12 km/hr Speed downstream = $\frac{45}{3} = 15$ km/hr

Speed of the stream = 15 – 12 = 3 km/hr Speed upstream = 12 – 3 = 9 km/hr

Time taken to cover 45 km upstream = $\frac{45}{9} = 5$ hours ∴ **Ans. D**

74. Speed upstream = $\frac{8}{\left(\frac{24}{60}\right)} = 20$ km/hr Speed of the stream = 4 km/hr

speed of boat in still water = (20 + 4) = 24 km/hr ∴ **Ans. D**

75. Speed of boat in still water = 25 km/hr Speed upstream = $\frac{10}{1} = 10$ km/hr

Speed of the stream = (25 – 10) = 15 km/hr Speed downstream = (25 + 15) = 40 km/hr

Time taken to travel 10 km downstream = $\frac{10}{40}$ hours= $\frac{10 \times 60}{40} = 15$ minutes ∴ **Ans. D**

76. Speed downstream= $\frac{1}{\left(\frac{5}{60}\right)} = 12$ km/hr Speed upstream = $\frac{4}{1} = 4$ km/hr

Velocity of the current = $\frac{1}{2}(12 - 4) = 4$ km/hr ∴ **Ans. A**

77. Speed of the boat in still water = 8 km/hr

Speed upstream = $\frac{1}{1}$ = 1 km/hr

Speed of the stream = 8 – 1 = 7 km/hr

Speed downstream = (8 + 7) = 15 km/hr

Time taken to travel 1 km downstream = $\frac{1}{15}$ hr = $\frac{1\times60}{15}$ = 4 minutes ∴ **Ans. D**

বিগত বছরের প্রশ্ন ও সমাধান | ২০১৯ সালের প্রশ্নপত্রের সমাধান

1. Two trains 105 meters and 90 meters long, run at the speeds of 45 km/h and 72 km/h respectively, in opposite directions on parallel tracks. The time which they take to cross each other, is:

(6 Banks & 2 Financial Institutions 10/05/2019)

A) 8 seconds B) 7 seconds C) 5 seconds D) 6 seconds **Ans. D**

Solution: Time = $\frac{(105+90)}{(45+72)\times\frac{5}{18}} = \frac{3510}{585}$ = 6 seconds.

2. The speed of a boat in still water in 15 km/hr and the rate of current is 3 km/hr. The distance travelled downstream in 12 minutes is-

(6 Banks & 2 Financial Institutions 10/05/2019)

A) 1.2 km B) 3.6 km C) 1.8 km D) 2.4 km **Ans. B**

Solution: Distance on down stream = $(15+3)\times\frac{12}{60}$ = 3.6 km.

3. A train can cross another train of equal length coming from the opposite direction with the speed of 108 km/h in 3 minutes. The speed of the other train is 90 km/h. Find the length of the train.

(4 Banks & 2 Financial Institutions 24/05/2019)

A) 5940 m B) 5490 m C) 4590 m D) 4950 m **Ans. D**

Solution: Length of train = $\frac{(108+90)}{2}\times\frac{5}{18}\times3\times60$ = 4950 m

4. A boat can travel from point A to point B and return back to point A in 9 hours. Speed of the boat in still water is 8 km/hr and the speed of the stream is 4 km/h. Find the distance between A and B)

(4 Banks & 2 Financial Institutions 24/05/2019)

A) 18 km B) 27 km C) 36 km D) 45 km **Ans. B**

Solution: Speed in downstream = (8 + 4) = 12 km/hr and upstream = (8 – 4) = 4 km/hr

∴ Ratio of time = 4: 12 = 1:3 ∴ Distance = $12\times\ 9\times\frac{1}{4}$ = 27 km.

Alternative: $\frac{x}{12}+\frac{x}{4}=9\Rightarrow\frac{4x}{12}=9$ ∴ x = 27 km.

5. A man rows a certain distance along the stream and against the stream in 1 hour and 1.5 hours respectively. If the velocity of there current is 3 km/hr. What is the speed of a man in still water?

Sonali Bank Ltd. Officer (FF,08-02-2019)

A) 12 km/hr B) 13 km/hr C) 11 km/hr D) 15 km/hr **Ans. D**

Solution: Let the speed of the man in still water is 'x' km/hr

So, Downstream speed (x + 3) km/hr

Upstream speed (x – 3) km/hr

According to the Question, (x + 3) × 1 = (x – 3) × 1.5 [Distance same]

$\Rightarrow x+3=1.5x-4.5\Rightarrow1.5x-x=7.5\Rightarrow0.5x=7.5$ ∴ $x=\frac{7.5}{0.5}=15$

6. A boat takes 19 hours to travel downstream from point A to point B and coming back to a point C midway. between A and B) If the speed of the stream is 4 km/hr and the speed of the boat in still water is 14 kn/hr. What is the distance between A and B?

Sonali Bank Ltd., Officer (cash'19)

A) 160 km B) 200 km C) 180 km D) 220 km **Ans. C**

Solution: Let distance be 'x' km, ATQ, $\frac{x}{14+4} + \frac{x/2}{14-4} = 19 \Rightarrow \frac{x}{18} + \frac{x}{20} = 19$

$\Rightarrow \frac{10x + 9x}{180} = 19 \Rightarrow 19x = 19 \times 180 \therefore x = 180$ km

7. A train starts from city Y at 2 PM and travels towards city X at 75 km/hr. Another train starts from city X at 1 PM and trains towards Y at 60 km/hr. If the distance between these two cities is 330 km then at what time will they meet?

Sonali Bank Ltd., Officer (cash'19)

A) 4:00 pm B) 5:00 PM C) 5:30 PM D) 6:00 PM **Ans. A**

Solution: 2nd train 1 ঘণ্টায় 60 km চলে যাওয়ায় দূরত্ব বাকি থাকবে 330 – 60 = 270 km

Opposite direction, তাই speed যোগ হবে সময় $t = \frac{270}{75 + 60} = 2$hr $\therefore$ They meet at = 2pm + 2hr = 4pm

8. Two trains P and Q are moving in opposite direction at a rate of 36 km/hr and 45 km/hr respectively. A passenger is sitting in train P, finds that his train passes train Q in 8 seconds. What is the length of train Q?

Sonali Bank Ltd., Officer (cash'19)

A) 195 m B) 175 m C) 190 m D) 180 m **Ans. D**

Solution: $S = (v_1 + v_2) \times t = (36 + 45) \times \frac{5}{18} \times 8$ (সময় sec এ আছে) = 180m

9. A boat takes 4 hours to cover a certain distance running downstream, while it requires 8 hours 48 minutes to cover the same distance. Find the ratio between the speed of the current and the speed of the boat?

Sonali Bank Ltd., Officer (cash'19)

A) 1:2 B) 3:8 C) 2:3 D) 4:3 **Ans. B**

Solution: Downstream speed = (s + y) km/hr

Upstream Speed = (x – y) km/hr

ATQ, $4(x + y) = \left(8 + \frac{48}{60}\right)(x - y) = 8.8(x - y) \Rightarrow 4x + 4y = 8.8x - 8.8y \Rightarrow \frac{y}{x} = \frac{4.8}{12.8} = \frac{3}{8}$ i.e y:x = 3:8

10. Katheen traveled to Gulshan Branch form Uttara Branch at speed of 3 km/hr. If her total travelling time was 5 hours, what is the distance in kms, of Gulshan Branch from Uttara Branch?

Sonali Bank Ltd., Officer (cash'19)

A) 15 B) 10 C) 9 D) 8 **Ans. A**

Solution: প্রশ্নে বলা হচ্ছে যে, একটি বৃত্তের ব্যাস 50% বাড়ানো হলে এর ক্ষেত্রফল কত বাড়বে?

ধরি, বৃত্তটির ব্যাসার্ধ r মিটার; ক্ষেত্রফল = πr^2 বর্গমিটার এবং ব্যাস = 2π মিটার।

ব্যাস 50% বাড়লে ব্যাস হবে = (2r + 50% of 2r)

মিটার $= \left(2r + \frac{50 \times 2r}{100}\right) = 3r$ মিটার $\therefore$ ব্যাসার্ধ $= \frac{3r}{2}$ মিটার $\therefore$ ক্ষেত্রফল $= \pi\left(\frac{3r}{2}\right)^2 = \frac{9r^2}{8} \times \pi$ মিটার

$\therefore$ শতকরা ক্ষেত্রফল বাড়বে $= \left(\frac{\frac{9\pi r^2}{4} - \pi r^2}{\pi r^2} \times 100\right)\% = \left(\frac{9\pi r^2 - 4\pi r^2}{\frac{4}{\pi r^2}} \times 100\right)\% = \left(\frac{5\pi r^2}{4} \times \frac{1}{\pi r^2}\right)\% = 125\%$

11. A boat goes 8km in one hour along the stream and 2km in one hour against the stream. The speed in km/hr of the stream is

Sonali Bank Ltd., Officer (cash'19)

A) 2 B) 4 C) 3 D) 5 **Ans. C**

Solution: প্রশ্নে বলা হচ্ছে যে, একটি নৌকা স্রোতের অনুকূলে ঘণ্টায় 8km এবং স্রোতের প্রতিকূলে ঘণ্টায় 2km দূরত্ব অতিক্রম করে। স্রোতের বেগ কত?

স্রোতের বেগ + নৌকার বেগ = 8

স্রোতের বেগ – নৌকার বেগ = 2

2 স্রোতের বেগ = 6

$\therefore$ স্রোতের বেগম $= \frac{6}{2} = 3$

12. A man riding his bicycle covers 150 meters in 25 seconds. What is his speed in km per hour?

Sonali Bank Ltd., Officer (cash'19)

A) 20 B) 23 C) 21.6 D) 25 **Ans. C**

Solution: প্রশ্নে বলা হচ্ছে, একজন লোক সাইকেলে 25 সেকে- 150 মিটার দূরত্ব অতিক্রম করলে লোকটির গতিবেগ কত?

জেনে রাখা ভালো ms^{-1} কে kmph এ পরিণত করতে $\frac{18}{3}$ দ্বারা গুণ করতে হয়।

আমরা জানি, গতিবেগ $= \frac{\text{দূরত্ব}}{\text{সময়}} = \frac{150}{25} ms^{-1} = 6^{ms-1} = \left(6 \times \frac{18}{5}\right)$ kmph = 21.6 kmph.

13. A train 108 m long moving at a speed of 50 km/hr crosses a train 112m long coming from opposite direction in 6 seconds. The speed of the second train is

Sonali Bank Ltd., Officer (cash'19)

A) 48 km/hr B) 54 km/hr C) 82 km/hr D) 66 km/hr **Ans. C**

Solution: এখানে, $d_1 = 108$ মিটার; $d_2 = 112$ মিটার; $v_1 = 50$ kmph; $v_2 = ?$; $t = 6$ সেকে-।

আমরা জানি, $t = \frac{d_1 + d_2}{v_1 + v_2} \Rightarrow 6 = \frac{108 + 112}{(50 + v_2) \times \frac{5}{18}} \Rightarrow 6 = \frac{220}{\frac{5(50 + v_2)}{18}} \Rightarrow \frac{6 \times 5(50 + v_2)}{18} = 220$

$\Rightarrow 250 + 5v_2 = 660 \Rightarrow 5v_2 = 410 \quad \therefore v_2 = \frac{410}{5} = 82$

14. A train 150 meter long and running at a speed of 60 km per hour takes 30 seconds to cross a bridge. What is a length of the bridge?

Sonali Bank Ltd., Officer (cash'19)

A) 350 meter B) 450 meter C) 500 meter D) 650 meter **Ans. A**

Solution: প্রশ্নে বলা হচ্ছে যে, 150 মিটার দীর্ঘ একটি ট্রেন 60km per hour বেগে চলে তা একটি ব্রিজকে 30 সেকে- অতিক্রম করে।

ব্রিজের দৈর্ঘ্য কত?

মনে করি, ব্রিজের দৈর্ঘ্য x মিটার

ট্রেনের গতিবেগ = 60kmph $= \left(60 \times \frac{5}{18}\right) ms^{-1} = \frac{50}{3} ms^{-1}$ এখন ঐ 30 সেকে- ট্রেন (150 + x) মিটার দূরত্ব অতিক্রম করবে।

প্রশ্নমতে, $\frac{50}{3} = \frac{x + 150}{30}$ [যেহেতু, গতিবেগ $= \frac{\text{দূরত্ব}}{\text{সময়}}$] $\Rightarrow \frac{x + 150}{10} = 50 \Rightarrow x + 150 = 500 \Rightarrow x = 500 - 150 \quad \therefore x = 350$

1. A man takes 3 hours 45 minutes to row a boat 22.5 km downstream of a river and 2 hours 30 minutes to cover a distance of 10 km up stream. Find the speed of the river current in km/hr. BSC, Officer (Cash'18)

A) 1 km/hr B) 2 km/hr C) 3 km/hr D) 4 km/hr

Hints:

ধরি, স্রোতের বেগ x কিমি/ঘণ্টা

নৌকার বেগ y কিমি/ঘণ্টা

এখন, $y + x = \frac{22.5}{3 + \frac{45}{60}} = \frac{22.5}{\frac{15}{4}} = 6$ কিমি/ঘণ্টা ..... (i) $\left[\because \text{বেগ} = \frac{\text{সরণ}}{\text{সময়}}\right]$

এবং $y - x = \frac{10}{2 + \frac{30}{60}} = \frac{10}{\frac{5}{2}} = 4$ কিমি/ঘণ্টা ..... (ii)

(i) – (ii) $\Rightarrow y + x - y + x = 6 - 4 \quad \Rightarrow 2x = 2 \quad \therefore x = 1$

2. A man can row 6 km/hr in still water. If the speed of the current is 2 km/hr, it takes 3 hrs more in upstream than in the downstream for the same distance. The distance is- BSC, Officer (Cash'18)

A) 30 km B) 24 km C) 20 km D) 32 km

Hints:

ধরি, দূরত্ব x কিমি

প্রশ্নমতে, $\frac{x}{6-2} - \frac{x}{6+2} = 3 \quad \left[\because \text{সময়} = \frac{\text{দূরত্ব}}{\text{বেগ}}\right] \Rightarrow \frac{x}{4} - \frac{x}{8} = 3 \Rightarrow \frac{2x - x}{8} = 3 \therefore x = 24$

3. A train 150 m long passes a pole in 15 seconds and crosses another train of the same length travelling in opposite direction in 8 seconds. The speed of the second train in (m/h) is- BSC, Officer (Cash'18)

A) 60 km/hr B) 66 km/hr C) 72 km/hr D) 99km/hr

Hints:

ধরি, দ্বিতীয় ট্রেনের গতিবেগ x মি/সে.

এবং প্রথম ট্রেনের গতিবেগ $\frac{150}{15} = 10$ মি/সে.

প্রশ্নমতে, $x + 10 = \frac{(150 + 150)}{8} \Rightarrow 8x + 80 = 300 \Rightarrow 8x = 220 \therefore x = \frac{220}{8}$

$\therefore$ দ্বিতীয় ট্রেনের গতিবেগ $\frac{220}{8}$ মি/সে. বা $\left(\frac{220}{8} \times \frac{3600}{1000}\right)$ কিমি/ঘণ্টা = 99 কিমি/ঘণ্টা।

4. The ratio of the speeds of a train and a man is 6:1. The length of the train is 650 m and crosses a pole in 1 minute 5 seconds. In how much time will the man cross the 240m long platform? BSC, Officer (Cash'18)

A) 1 min 24 sec B) 2 min 30sec C) 2 min D) 2 min 24 sec

Hints:

ট্রেনের গতিবেগ $= \frac{650}{65} = 10$ মি./সে. [$\because$ 1 মিনিট 5 সেকেন্ড = 65 সে.]

লোকটির " $= \frac{650}{65} = \frac{5}{3}$ মি/সে. [$\because$ 6 × লোকটির গতিবেগ = ট্রেনের গতিবেগ]

প্লাটফর্মটি অতিক্রম করতে লোকটির সময় লাগবে $= \frac{240}{\frac{5}{3}}$ সেকেন্ড $= \frac{240 \times 3}{5}$ সেকেন্ড = 144 সেকেন্ড = 2 মিনিট 24 সেকেন্ড।

5. A man covers a total distance of 100 km on bicycle. For the first 2 hours, the speed was 20 km/hr and for the rest of the journey, it came down to 10km/hr. The average speed will be – BSC, Officer (General'18)

A) 12.5 km/hr B) 13 km/hr C) 14.5 km/hr D) 20 km/hr

Hints:

প্রথম 2 ঘণ্টায় মোট অতিক্রান্ত দূরত্ব (2×20) বা 40 কিমি.

$\therefore$ অবশিষ্ট $(100 - 40)$ বা 60 কি.মি. অতিক্রম করে $= \frac{60}{10}$ বা 6 ঘণ্টায় ।

মোট সময় = 6 + 2 ঘণ্টা = 8 ঘণ্টা $\therefore$ গড় বেগ $= \frac{100}{8}$ কি.মি/ঘণ্টা = 12.5 কিমি/ঘণ্টা

6. A man can reach a certain place in 40 hours. If he reduces his speed by $1/15^{th}$, he goes 5 km less in that time. Find the total distance covered by him. BSC, Officer (General'18)

A) 60 km. B) 85 km. C) 52 km. D) 75 km.

Hints:

ধরি, লোকটির গতিবেগ x কিমি/ঘণ্টা

প্রয়োজনীয় সময় 40 ঘণ্টা

$\therefore$ অতিক্রান্ত দূরত্ব $= 40 \times x$ কিমি

এখন, গতিবেগ $\frac{1}{15}$ অংশ কমে গেলে, গতিবেগ $= x - \frac{x}{15} = \frac{14x}{15}$

$\therefore$ অতিক্রান্ত দূরত্ব $= \left(40 \times \frac{14x}{15}\right)$ কিমি $= \frac{112x}{3}$,,

প্রশ্নমতে, $40x - \frac{112x}{3} = 5 \Rightarrow \frac{120x - 112x}{3} = 5 \Rightarrow 8x = 15 \therefore x = \frac{15}{8}$ $\therefore$ অতিক্রান্ত দূরন্ত $= 40 \times \frac{15}{8}$ বা 75 কিমি.

7. A boat travel with a speed of 10 km/hr in still water. If the speed of the stream is 3 km/hr then find time taken by boat to travel 52 km downstream. BSC, Officer (General'18)

A) 2 hrs B) 4 hrs C) 4 hrs D) 9 hrs

Hints:

স্থির পানিতে নৌকার বেগ = 10 কিমি/ঘণ্টা

স্রোতের বেগ = 3 কিমি/ঘণ্টা

$\therefore$ স্রোতের অনুকূলে মোট বেগ = (10 + 3) বা 13 কিমি/ঘণ্টা $\therefore$ মোট সময় $= \frac{52}{13}$ বা 4 ঘণ্টা

8. A train passes a platform in 40 sec and a woman standing on the platform in 30 sec. If the speed of the train is 108 km/hr, what is the length of the platform? BSC, Officer (General'18)

A) 100 m B) 300 m C) 900 m D) 1020 m

Hints:

ট্রেনের গতিবেগ $= \frac{108 \times 1000}{3600}$ = 30 মিটার/ সেকেন্ড

ট্রেনের দৈর্ঘ্য = বেগ $\times$ সময় $= (30 \times 30)$ মিটার = ৯০০ মিটার

ধরি, প্লাটফর্মের দৈর্ঘ্য x মিটার

$\therefore \frac{900 + x}{30} = 40 \Rightarrow x + 900 = 1200 \therefore x = 300$

9. A train 125 m long passes a person, running at 8 km/hr in the same direction in which the train is going in 25 seconds. The speed of the train is: BSC, Officer (General'18)

A) 22 B) 36 C) 30 D) 26

Hints:

ধরি,

ট্রেনের বেগ x মি/সেকেন্ড এবং লোকটির বেগ $= \frac{8 \times 1000}{3600} = \frac{20}{9}$ মি/সেকেন্ড

$\therefore$ আপেক্ষিক বেগ $= \left(x - \frac{20}{9}\right)$ মি/সেকেন্ড

প্রশ্নমতে, $\frac{125}{x - \frac{20}{9}} = ২৫ \Rightarrow \frac{5}{\frac{9x - 20}{9}} = 1 \Rightarrow 9x - 20 = 45 \Rightarrow 9x = 65$

$\therefore x = \frac{65}{9}$ সুতরাং, $x = \frac{65 \times 3600}{9 \times 1000} = 26$ কিমি/ঘণ্টা।

10. With a uniform speed, a car covers a distance in 8 hours. Had the speed been increased by 4 km/hr, the same distance could have been covered in 7 hours and 30 minutes. What is the distance covered? BSC (SO'18)

A) 420 km B) 480 km C) 520 km D) 640 km

Hints:

ধরি,

১ম ক্ষেত্রে speed x km/hr

$\therefore$ 2য় ক্ষেত্রে " (x + 4) km/hr

$\therefore 8x = 7.5 (x + 4)$ [$\because$7 hours and 30 minutes = 7.5 hours]

$\Rightarrow 8x = 7.5x + 30 \Rightarrow 0.5x = 30 \therefore x = 60$

$\therefore$ দূরত্ব = (8 × 60) km = 480 km

11. The respective ratio between the speed a car, a train, and a bus is 5: 9: 4. The average speed of the car, bus and train is 72 km/hr together. What is the average speed of the car and the train together. BSC (SO'18)

A) 82 km/h B) 72 km/h C) 67 km/h D) 84 km/h

Hints:

Car, bus ও train এর মোট speed (3 × 72) km/hr = 216 km/hr

$\therefore$ car এর speed $\left(216 \text{ এর } \frac{5}{18}\right)$ km/hr = 60 km/hr

train " " $\left(216 \text{ এর } \frac{9}{18}\right)$ km/hr = 108km/r

$\therefore$ car ও train এর average speed $\left(\frac{108 + 60}{2}\right)$ km/hr = 84 km/hr.

12. A boat travel with a speed of 10 km/hr in still water. If the speed of the stream is 3 km/hr then find time taken by boat to travel 52 km downstream. BSC (SO'18)

A) 2 hrs B) 4 hrs C) 6 hrs D) 9 hrs

Hints:

স্রোতের অনুকূলে বেগ = (10 + 3) km/hr = 13 km/hr

$\therefore$ স্রোতের অনুকূলে, 52 km যেতে সময় লাগে $= \frac{52}{13}$ hrs = 4 hrs

13. Rahim can row 16 km/hr in still water. it takes her thrice as long to row up as to row down the river. Find the difference between her speed in still water and that of the stream. BSC (SO'18)

A) 8 km/hr B) 16 km/hr C) 24 km/hr D) 12 km/hr

Hints:

ধরি,

স্রোতের প্রতিকূলে বেগ x km/hr

∴ " " " 3x km/hr

এবং স্রোতের বেগ u km/hr

এখন, $16 + u = 3x$

$\underline{16 - u = x}$

$32 = 4x$

∴ $x = 8$

∴ স্রোতে বেগ $u = 16 - 8 = 8$ km/hr

14. A train leaves a station A at 7 am and reaches another station B at 11 am. Another train leaves B at 8 am and reaches A at 11:30 am. The two trains cross one another at- BSC (SO'18)

A) 8:36 am B) 8:56 am C) 9:00am D) 9:24am

Hints:

ধরি, A ও B এর মধ্যকার দূরত্ব d km এবং ট্রেন দুটি t সময়ে একে অপরকে অতিক্রম করবে।

১ম ট্রেন 4 ঘণ্টায় যায় d km

∴ " " 1 " " $\frac{d}{4}$ "

২য় ট্রেন 3.5 ঘণ্টায় যায় d km

∴ " " 1 " " $\frac{d}{3.5}$ "

∴ $\frac{td}{4} + \frac{(t-1)\,d}{3.5} = d \Rightarrow \frac{3.5t + 4t - 4}{14} = 1 \Rightarrow 7.5\,t = 14 + 4 \Rightarrow t = \frac{18}{7.5} \Rightarrow t = 2.4$

∴ t = 2 hrs 24 minutes ∴ ট্রেন দুটি 9:24 am এ একে অপরকে অতিক্রম করবে।

15. A train 150 m long crosses a milestone in 15 seconds and crosses another train of the same length travelling in the opposite direction in 12 second. The speed of the second train in km/hr is. BSC (SO'18)

A) 52 km/hr B) 56 km/hr C) 54 km/hr D) 58 km/hr

Hints:

15 সেকেন্ডে যায় 150 m

∴ 3600 " " $\frac{150\times3600}{15}$ m = 36000 m = 36 km

ধরি, ২য় ট্রেনের বেগ x km/hr

∴ relative speed = (36 + x) km/hr

∴ $\frac{12(36 + x) \times 1000}{3600} = (150 + 150) \Rightarrow 360 + 10x = 900 \Rightarrow 10x = 900 - 360 \Rightarrow x = \frac{540}{10}$ ∴ x = 54

16. এক ব্যক্তি ঘণ্টায় ৮ কিলোমিটার দৌড়ে কত মিনিটে ৫২০০ মিটার পার হবে? BSC, 8 Govt. Banks & Financial Institutes (SO'18)

ক) ৩৬ মি. খ) ৩৫ মি. গ) ৩৯ মি. ঘ) ৩৮ মি.

Hints:

৮ কিমি যায় ৬০ মিনিটে

১ " " $\frac{৬০}{৮}$ "

৫.২ " " $\frac{৬০\times৫.২}{৮\times১০}$ = ৩৯ মিনিটে

17. Ravi leaves home for stadium which is 12 km from his house. After the stadium, he goes to his club which is 7 km from his stadium. If his house, stadium and club all fail in a time, then what is the minimum distance he has to travel to get back home? Sonali Bank Ltd. Officer (Cash'18)

A) 19 km B) 7 km C) 5 km D) 12 km

Hints:

H $\frac{12km}{}$ S $\frac{7km}{}$ C ∴ সর্বোচ্চ দূরত্ব = (12 + 7) km = 19 km

H $\frac{12km}{}$ S H $\frac{7km}{}$ S

∴ এক্ষেত্রে সর্বনিম্ন দূরত্ব (12 – 7) km = 5 km

18. If a man cycles at 10 km/hr, then he arrives at a certain place at 1 pm. If he cycles at 15 km/hr, he will arrive at the same place at 11 am. At what speed must he cycles to get there at noon? Sonali Bank Ltd. Officer (Cash'18)

A) 11 km/hr B) 12 km/hr C) 13 km/hr D) 14 km/hr

Hints:

ধরি, স্থানটির দূরত্ব xkm $\Rightarrow \frac{x}{10} - \frac{x}{15} = 2 \Rightarrow \frac{3x-2}{30} = 2 \therefore x = 60$

∴ প্রথম ক্ষেত্রে সময় লাগে $\frac{60}{10}$ ঘণ্টা = 6 ঘণ্টা।

২য় " " " $\frac{60}{15}$ " = 4 "

∴ ৩য় ক্ষেত্রে সময় লাগে 5 ঘণ্টা

∴ ৩য় ক্ষেত্রে speed হবে = $\frac{60}{5}$ km/hr = 12 km/hr

19. A person travels a certain distance at 3 km/hr and reaches 15 min late. If he travels at 4 km/hr, he reaches 15 min earlier. The distance he has to travel is- BSC, Officer (Cash'18)

A) 4.5 km B) 6 km C) 7.2 km D) 12 km

Hints: ধরি, দূরত্ব = x কিমি: সুতরাং, $\frac{x}{3} - \frac{x}{4} = \frac{15+15}{60} \Rightarrow \frac{4x-3x}{12} = \frac{30}{60} \Rightarrow \frac{x}{12} = \frac{1}{2} \therefore x = 6$

বিগত বছরের প্রশ্ন ও সমাধান — Bangladesh Bank

1. A boat can travel from point A to point B and return back to point A in 9 hours. Speed of the boat in still water is 8 km/hr and the speed of the stream is 4 km/h. Find the distance between A and B. BB,AD (General'18)

A) 18 km B) 27 km C) 36 km D) 45 km **Ans. B**

Solution: Speed in downstream = (8 + 4) = 12 km/hr and upstream = (8 – 4) = 4 km/hr

∴ Ratio of time = 4: 12 = 1:3 ∴ Distance = $12 \times 9 \times \frac{1}{4}$ = 27 km.

Alternative: $\frac{x}{12} + \frac{x}{4} = 9 \Rightarrow \frac{4x}{12} = 9 \therefore x = 27$ km.

2. A train 240m long passed a pole in 24 seconds. How long will it take to pass a platform 650m long? BB, AD (General'18)

A) 65s B) 89s C) 100s D) 130s

Solution: ট্রেনের বেগ $= \frac{240}{24} = 10\text{ms}^{-1}$

$\therefore$ 10m অতিক্রম করে 1 সেকেন্ডে $\quad\quad$ $\therefore$ 1m " " $\frac{1}{10}$ সেকেন্ডে $\therefore$ (650 + 240) বা, " $\frac{890}{10} = 89$ সেকেন্ডে

3. A person has to cover a distance of 6 km in 45 minutes. If he covers one-half of the distance in two-thirds of the total time; to cover the remaining distance in the remaining time, his speed (in km/hr) must be.

BB, AD (GENERAL SIDE'16)

A) 15 $\quad$ B) 6 $\quad$ C) 8 $\quad$ D) 12

Solution: One half of the distance of 6km.

He has to cover remaining 3 km in one-third of time 45 minutes which is $\frac{45}{3}$ or 15 minutes or $\frac{1}{4}$ hours.

$\therefore$ His speed in km/hr $= \frac{3}{\frac{1}{4}} = 3 \times 4 = 12$

4. How many seconds will a 500 metre long train take to cross a man walking with a speed of 3 km/hr in the direction of the moving train if the speed of the train is 63 km/hr? BB, AD (GENERAL SIDE'16)

A) 45 $\quad$ B) 25 $\quad$ C) 30 $\quad$ D) 40

Solution: As the direction of train and man is same,

the relative velocity of the train would be = (63 – 3) = 60 km/hr. $= 60 \times \frac{1000}{3600}$ m/s

$\therefore$ time required to pass $= \frac{500}{60 \times \frac{1000}{3600}} = 30$ seconds

5. A train 800 meters long is running at a speed of 78 km/hr. If it crosses a tunnel in 1 minute, then the length of the tunnel (in meters) is: BB, OFFICER (CASH'16)

A) 360 $\quad$ B) 500 $\quad$ C) 540 $\quad$ D) 130

Solution: 78 km/hr $= \frac{78 \times 1000}{60}$ m/min = 1300 m/min

$\therefore$ in 1 minute it travels 1300 m/min

$\therefore$ 1300 = 800 + length of tunnel

$\therefore$ length of tunnel = 500 meter