WORKBOOK OF ANALYTICAL SKILLS-1

PEA-306

Department of Analytical Skills
Centre of Professional Enhancement

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PREFACE

Companies that hire students through campus placements have various rounds to shortlist suitable candidates; these rounds include aptitude tests, group discussions and then personal interview. Most, if not all the companies follow this recruitment pattern. Almost 90% of the applied candidates don't clear the aptitude test. The aptitude test is used to test the candidate on Quantitative Aptitude, Verbal Ability, and Analytical Ability/Logical Reasoning. Quantitative Aptitude and Reasoning is very important subject to test your problem-solving skills. So, in every competitive written exam they asked questions from this subject, not only in written they may ask some brain storming puzzles in interview also. It is the one of the key concepts to qualify written exam almost every student who know basic mathematics can solve most of the questions in the exam but the main problem is that the time management, the recruiters does not give enough time to solve the problems so one who has more practice the model questions before exam can easily solve in the exams. This book is essential for aptitude exams as all the important topics are discussed in this book. This book explains all the concepts clearly and also covers all the types of the questions.

TIME AND WORK

Work to be considered as one unit. It may be constructing a wall, filling a tank, or eating certain amount of food.

There are some basic assumptions that are made in the problems of time and work. They are taken for granted and are not specified in every problem.

1. If a person does some work in a certain no. of days, we assume that he does the work uniformly i.e. he does the same amount of work every day.

For example, if a man can do a work in 5 days, it means that he does 1/5 work in 1 day and same 1/5 work on second day and so on till the work complete.

2. If there is more than one person carrying out the work, it is assumed that each person unless otherwise specified, does the same amount of work each day. It means they share work equally.

For example, if 4 persons together completes a work in 2 days, it means that one person can do it in 8 days and this means that each person can do 1/8 of the work per day. So basic concept used in solving the problems related to time and work is that

- If a person completes a work in n days, then the work done by that person in one day will be 1/n.
- Similarly, if the work done by a person is one day is 1/k, then he will complete the work in k days.

If A can do a piece of work in p days and B can do it in q days then A and B together can complete the same in pq/p+q days

If A can do a piece of work in p days and B can do it in q days then A and B together can complete the same in LCM (p,q) /(lcm/p+lcm/q) days. This method may also use if the no. of men is more than two.

Examples:

Ex1. – A can do a work in 10 days. B can do the same work in 15 days. In how many days can the work be completed if A and B work together?

Sol: method 1: work done by A in 1 day = 1/10

Work done by B in 1 day = 1/15

Work done by A and B together in 1 day = 1/10 + 1/15= 1/6

They can complete it in 6 days.

Method 2: using formula A and B can do the work in

10x15 / 10+15 = 150/25 = 6 days.

Method 3: calculate LCM (10, 15) = 30

The answer in how days they will complete the work together will be

30/ (30/10 + 30/15) = 6 days.

By the method of LCM the problems in which there are more than 2 persons working can also be solved easily.

Ex2. – If A, B, C and D can complete a piece of work in 10, 15, 20 and 25 days respectively. Find in how many days they will complete the work working together?

Sol: by method third of previous example, we first find LCM (10, 15, 20, 25) i.e. = 300

Now divide this LCM with no. of days in which they complete the work individually

300/10 = 30, 300/15 = 20, 300/20 = 15 and 300/25 = 12

Hence the answer will be 300/(30+20+15+12) = 300/77 days.

Ex3. – A and B together can do a piece of work in 24 days and A alone can complete the work in 36 days. How long will B alone take to complete the work?

Work done by A alone in 1 day = 1/36

Work done by both in 1 day= 1/24

Hence work done by B alone in 1 day = 1/24- 1/36 = 1/72

And hence B will complete the work in 72 days.

Ex4. – A and B together complete a work in 36 days, B and C together completes in 48 days. And A and C completes in 72 days. How long would each take to do the job?

Sol: A+B work in 1 day = 1/36..... (1)

B+C work in 1 day= 1/48..... (2)

A+C work in 1 day = 1/72..... (3) Adding (1) + (2) + (3), we get

2(A+B+C)'s 1 day work = 1/36+1/48+1/72 = 9/144 = 1/16

And hence (A+B+C)'s 1 day work = 1/32

Now 1 day work of A = 1/32 – 1/48 = 1/96 therefore A completes the work in 96 days.

Now 1 day work of B = 1/32 – 1/72 = 5/288 therefore A completes the work in 288/5 days.

Now 1 day work of C = 1/32 – 1/36 = 1/288 therefore A completes the work in 288 days.

Ex5. – A can do in 18 days. When he had work for 2 days, B joined him. If they complete the **remaining work in 4 more days. In how many days B alone finish the whole work?**

Sol: Work done by A in 1 day= 1/18

Number of days A work = 2+4 = 6 therefore, total work done by A = 6x1/18 = 1/3

The remaining 2/3 work is done by B in 4 days and hence complete work done by B will be 4x(3/2) = 6 days.

Ex6. – Ram completes 60% of a task in 15 days and then takes the help of Rahim and Rachel. Rahim is 50% as efficient as Ram is and Rachel is 50% as efficient as Rahim is. In how many more days will they complete the work?

Ram completes 60% of the task in 15 days.

i.e., he completes 4% of the task in a day.

Rahim is 50% as efficient as Ram is.

Therefore, Rahim will complete 2% of the task in a day.

Rachel is 50% as efficient as Rahim is

Therefore, Rachel will complete 1% of the task in a day.

Together, Ram, Rahim and Rachel will complete 4+2+1 = 7% of the work in a day.

They have another 40% of the task to be completed.

Therefore, they will take 40/7 more days to complete the task.

Ex7. – X can do a piece of work in 20 days working 7 hours a day. The work is started by X and on the second day one man whose capacity to do the work is twice that of X, joined. On the third day another man whose capacity is thrice that of X, joined and the process continues till the work is completed. In how many days will the work be completed, if everyone works for four hours a day?

Sol: Since X takes 20 days working 7 hours a day to complete the work, the number of day-hours required to complete this work would be 140 day- hours. Like in the two problems above, this is going to be constant throughout. So, W = 140 day-hours.

Amount of work done in the 1st day by X = 1 day x 4 hours = 4 day-hours 2nd day, X does again 4 day-hours of work.

The second person is twice as efficient as X so he will do 8 day-hours of work. Total work done on second day =8+4= 12 day-hours. Amount of work completed after two days= 12+4 = 16 day-hours.

3rd day, X does 4 day- hours of work. Second person does 8 day-hours of work. Third person who is thrice as efficient as X does 12 day-hours of work. Total work done on 3rd day = 4+8+12 = 24 day-hours. Amount of work completed after 3 days = 16+ 24 = 40 day-hours. Similarly on 4th day the amount of work dome would be 4+8=12+16 = 40 day-hours. Work done on the 5th day = 4+12+16+20= 60 day-hours. Total work done after 5 days= 4+12+24+40+60 = 140 day-hours= W. So it takes 5 days to complete the work.

Ex8. – P, Q and R can do a work in 20, 30 and 60 days respectively. How many days does it need to complete the work if P does the work and he is assisted by Q and R on every third day?

Sol: Amount of work P can do in 1 day = 1/20

Amount of work Q can do in 1 day = 1/30

Amount of work R can do in 1 day = 1/60

P is working alone and every third day Q and R is helping him

Work completed in every three days = 2 x (1/20) + (1/20 + 1/30 + 1/60) = 1/5

So work completed in 15 days = 5 x 1/5 = 1

Hence, the work will be done in 15 days

Chain Rules

In order to understand the concept of chain rule first we should recollect the fundamentals on variation (direct and inverse) for example

- If the work increases the number of men required to complete the work in same number of days increases proportionately and vice versa and hence directly proportional.
- If the work remaining constant men and days are inversely proportional i.e., if the number of men increases, the number of days required to complete the same work decreases and vice versa and hence inversely proportional.

In general, we can use a formula in chain rule i.e.,

If M1 no. of men can complete a work in D1 days and M2 no. of en can complete a work in D2 day then M1 x D1 = M2 x D2

If M1 no. of men can complete a work in D1 days working H1 hours per day and M2 no. of men can complete a work in D2 days working H2 hours per day then M1 x D1 x H1 = M2 x D2 x H2

If M1 no. of men can complete a work W1 in D1 days working H1 hours per day and M2 no. of men can complete a work W2 in D2 days working H2 hours per day then

(M1 x D1 x H1)/W1 = (M2 x D2 x H2)/W2

Now we will clear the above concepts with the help of some examples.

Ex1. – 36 men can complete a piece of work in 18 days. In how many days will 27 men complete the same work?

Sol: less men, means more days (indirect proportion)

Let the number of days be x

Then, 27: 36:: 18: x

[Please pay attention, we have written 27:36 rather than 36:27, in indirect proportion, if you get it then chain rule is clear to you :)]

x = (36 x 18)/27

x = 24

So 24 days will be required to get work done by 27 men.

Ex2. – 39 persons can repair a road in 12 days, working 5 hours a day. In how many days will 30 persons, working 6 hours a day, complete the work?

Sol: Let the required number of days be x.

Less persons, more days (indirect proportion)

More working hours per day, less days (indirect proportion)

Person 30:39: : 12: x

Working hours/day 6:5

30 X 6 X x = 39 X 5 X 12

x = 39 x 5 x 12

30x 6

x = 13

Ex3. - An industrial loom weaves 0.128 meters of cloth every second. Approximately, how any seconds will it take for the loom to weave 25 meters of cloth?

Sol: Let the time required by x seconds.

Then, more cloth means more time (direct proportion)

So, 0.128: 1: : 25 : x

x = (25 x 1)/0.128

x = 195.31

So time will be approx. 195 seconds

Ex4. – A fort had provision of food for 150 men for 45 days. After 10 days, 25 men left the fort. The number of days for which the remaining food will last, is:

Sol: After 10 days: 150 men had food for 35 days.

Suppose 125 men had food for x days.

Now, less men, more days (indirect proportion)

125 : 150 :: 35 : x

125 x x = 150 x 35

x = (150 x 35)/125

x = 42.

Ex5. – If 18 binders bind 900 books in 10 days, how many binders will be required to bind 660 books in 12 days?

Sol: Let the required no. of binders be x.

Less books, less binders (direct proportion)

More days, less binders (indirect proportion)

Books 900:600 :: 18 : x

Days 12:10

(900 x 12 x x) = (600 x 10 x 18)

x = 600 x 10 x 18

x = (600 x 10 x 18)/900 x 12

= 11.

Ex6. – A contractor undertakes to do a piece of work in 40 days. He engages 100 men at the beginning and 100 more after 35 days and completes the work in stipulated time. If he had not engaged the additional men, how many days behind schedule would it be finished?

[(100 x 35) + (100 x 35) + (200 x 5)] men can finish the work in 1day

4500 me can finish the work in 1 day. 100 men can finish it in 4500/100 = 45 days.

This is 5 days behind schedule

All the above examples an also be solved by using formula

(M1 x D1 x H1)/W1 = (M2 x D2 x H2)/W2

The values which are in numerator are those who have indirect proportion with the unknown value and those who have direct proportion with unknown is kept in denominator.

Class Practice Problems

1. A and B together can do a specific work in 8 days. B alone can do it in 10 days, then time taken by A alone is?
A. 28 days B. 36 days C. 40 days D. 32 days

2. A, B, C together can do a work in 6 days. A alone can do it in 12 days while B alone can do it in 18 days, then time taken by C is?
A. 9 days B. 18 days C. 27 days D. 36 days

3. A and B can do a piece of work in 15 days. B and C can do the same work in 10 days, A and C can do the same work in 12 days. Time taken by A, B and C together to do the job is?
A. 4 days B. 9 days C. 8 days D. 5 days

4. A & B working together can do a piece of work in 8 days. B & C working together can do a piece of work in 12 days. A, B and C all working together can do a piece of work in 6 days. In how many days A & C working together can do?
A. 3 B. 4 C. 6 D. 8

5. A, B and C can do a piece of work in 11, 20 and 55 days respectively. In how many days work will be finished if A is assisted by B and C on alternative day?
A. 4 B. 6 C. 8 D. 16

6. A, B and C can do a piece of work in 20, 30 and 60 days respectively. In how many days work will be finished by A, if he is assisted by B and C on every third day?
A. 5 B. 10 C. 15 D. 20

7. A can do a work in same time in which B & C can do it working together. A & B working together can do it in 10 days. C can do same in 50 days. In how many days B can do the work individually?
A. 2 B. 5 C. 15 D. 25

8. A, B and C can do a piece of work in 24, 32 and 64 days respectively. They starts working, A left the work after 6 days while B left the work before 6 days from the completion of work. In how many days work will be finished?
A. 20 B. 18 C. 15 D. None of these

9. A is twice as good as B and together they can finish the work in 18 days. In how many days A will finish the same work?
A. 9 B. 24 C. 54 D. 27

10. A is thrice as good as B and he is able to finish the work 60 days less than B. In how many days they will finish the same work together?
A. 90/4 B. 45/4 C. 30/4 D. 22/4

11. 10 men can complete a piece of work in 15 days and 15 women can complete the same work in 10 days. If all the 10 men and 15 women work together, in how many days will the work get completed?
A. 6 B. 5 C. 8 D. 9

12. 12 men or 18 women can do a job in 14 days. In how many days work will be finished by 8 men and 16 women?
A. 8 days B. 9 days C. 12 days D. 4 and half days

13. 12 men or 15 women can do a job in 4 days. 6 men start working and left after 2 days. How many women were put on the job to complete the remaining work in next 3 days?
A. 12 B. 15 C. 18 D. 21

14. 10 men and 15 women together can complete a work in 6 days. It takes 100 days for one man alone to complete the same work. How many days will be required for one woman alone to complete the same work?
A. 90 B. 125 C. 145 D. 225

15. 2 men and 5 women can do a work in 12 days. 5 men and 2 women can do that work in 9 days. Only 3 women can finish the same work in?
A. 36 B. 21 C. 30 D. 42

16. 2 men and 3 women finish 25% of the work in 4 days, while 6 men and 14 women can finish the whole work in 5 days. In how many days will 20 women finish it?
A. 20 B. 25 C. 24 D. 30

17. A can do a job in 10 days and B in 15 days. They are working together and charged ₹ 5000. What will be the share of A?
A. 1000 ₹ B. 2000 ₹ C. 3000 ₹ D. 4000 ₹

18. A can do a job in 10 days and B in 15 days. They charged ₹ 5000 together for same job and A worked only for 4 days. Rest work is done by B. what will be the share of B?
A. 1000 ₹ B. 2000 ₹ C. 3000 ₹ D. 4000 ₹

19. Three people A, B and C can finish a piece of work in 4, 9 and 12 days. Rs 1600 is the total money allocated to complete that work. What amount will each person get if all three are working together?
A. 900, 400, 300 B. 400, 300, 900 C. 600, 300, 900 D. 900, 300, 600

20. A can build 3 software packages in 48 days and B can build 4 software packages in 48 days. If, with the help of C, they can build 5 software packages in 20 days, then C alone can build 5 software packages in?
A. 42 days B. 48 days C. 36 days D. 38 days

21. A can make 10000 papers in an hour B can make 8000 papers in an hour. Find in how many days they both can make 5,90,000 papers, if A do work for 7 hours and B do work for 6 hours?
A. 4 days B. 3 days C. 5days D. 6days

22. A builder decided to form a house in 45 days. He employed 150 workers in the beginning and 120 more workers after 30 days and finished the contract in time. If he had not employed the extra workers, how many days behind the schedule work has been finished?
A. 57 days B. 23 days C. 18 days D. 12 days

23. In a camp, there is a food for 400 students for 30 days but after 20 days, 200 students left. For how many more days the food will last now?
A. 10 days B. 30 days C. 40 days D. 20 days

24. A can do a work in 15 days and B can do it in 18 days. With the help of C, all of them complete the work In 6 days. A, B and C received total Rs.27,000 for the whole work. What is the share of C, If the money is distributed in the ratio of amount of work done, individually?
A. Rs. 2700 B. Rs. 14400 C. Rs. 7200 D. Rs. 6300

25. Milinda takes $8\ ^1/_3$ hours more when she works alone in comparison of when she works with Bill. While Bill takes $5\ ^1/_3$ hours more when he works alone in comparison of when he works with Milinda. How long it will take by Bill to complete the work alone?
A. 10 hrs B. 15 hrs C. 18 hrs D. 12 hrs

Tutorial Practice Problems

1. A & B working together can do a piece of work in 12 days. B & C working together can do a piece of work in 15 days. C & A working together can do a piece of work in 20 days. In how many days A can do the same work?
A. 20 B. 30 C. 40 D. 60

2. A can do a piece of work in 8 hours. B can do same piece of work in 12 hours. A start working at 9 AM and they worked on alternative hours. At which time work will be finished?
A. 3:30 pm B. 6:30 pm C. 3:30 am D. 6:30 am

3. A can do a piece of work in 9 days. B can do same piece of work in 10 days. C can do same piece of work in 15 days. B and C start working and left after 2 days. In how many days remaining work will be finished by A?
A. 4 B. 6 C. 8 D. 10

4. A and B can do a piece of work in 20 and 30 days respectively. Both starts working on same time but B left the work 5 days before the completion of work. In how many days work will complete?
A. 12 B. 14 C. 16 D. 20

5. A & B working together can do a piece of work in 12 days. B & C working together can do same work in 16 days. A worked for 5 days, B for 7 days and rest work is finished by C in 13 days. In how many days working alone C can do the same work?
A. 48 B. 24 C. 8 D. 12

6. A can do a piece of work in 12 days. B can do same piece of work in 15 days. After A had worked for 3 days B also join A to finish the remaining work. In how many days work will be finished?
A. 3 B. 5 C. 6 D. 8

7. A can do a piece of work in 25 days and B in 20 days. They work together for 5 days and then A goes away. In how many days will B finish the remaining work?
A. 17 B. 11 C. 12 D. 10

8. A & B working together can do a job in 30 days. They worked only for 20 days and the rest job is done by A in next 20 days. In how many days A can do the complete job individually?
A. 30 B. 40 C. 60 D. 120

9. Jay and Anup can do a job, each working alone in 30 and 15 days respectively. Jay started the work and after a few days, Anup joined him. They completed the work in 18 days from the start. After how many days did Anup joined Jay?
A. 6 B. 10 C. 12 D. 14

10. Monica can do a job in 20 days. Tanya is 25% more efficient than Monica. In how many days Tanya will finish the same work?
A. 14 B. 15 C. 16 D. 18

11. A is 50% more efficient than B. C does half of the work done by A & B together. If C alone do the work in 40 days. In how many days all will finish the same work together?
A. 10/3 B. 20/3 C. 30 D. 40/3

12. Jyothi can do 3/4 of a job in 12 days. Mala is twice as efficient as Jyothi. In how many days will Mala finish the job?
A. 6 days B. 8 days C. 12 days D. 16 days

13. Kim can do a work in 3 days while David can do the same work in 2 days. Both of them finish the work together and get Rs. 150. What is the share of Kim?
A. Rs. 30 B. Rs. 60 C. Rs. 70 D. Rs. 75

14. A alone can do a piece of work in 6 days and B alone in 8 days. A and B undertook to do it for Rs. 3200. With the help of C, they completed the work in 3 days. How much is to be paid to C?
A. Rs. 375 B. Rs. 400 C. Rs. 600 D. Rs. 800

15. A can do a job in 10 days and B in 15 days. They are working on a project of ₹ 1500. If A and B worked for 5 days and rest work is finished by C in 2 days. What will be the daily wages of C?
A. 100 ₹ B. 125 ₹ C. 225 ₹ D. 250 ₹

16. Twenty women can do a work in sixteen days. Sixteen men can complete the same work in fifteen days. What is the ratio between the capacity of a man and a woman?
A. 3 : 4 B. 4 : 3 C. 5 : 3 D. 3 : 5

17. If 6 men and 8 boys can do a piece of work in 10 days and, 26 men and 48 boys can do the same in 2 days. Then, the time taken by 15 men and 20 boys to do the same type of work will be?
A. 5 days B. 4 days C. 6 days D. 7 days

18. If 10 men or 20 women or 40 children can do a piece of work in 7 months. Then, 5 men, 5 women and 5 children together can-do half of the work in?
A. 6 months B. 4 months C. 5 months D. 8 months

19. 4 men and 6 women can do a work in 8 days. 3 men and 7 women can do that work in 10 days. Only 20 women will finish the same work in?
A. 36 B. 32 C. 24 D. 20

20. Lal singh can eat 50 laddoos in 4 hours and Pal singh can eat 42 laddoos in 6 hours. If both of them start together, then what is the total time required by them to eat 507 laddoos?
A. 20 hours B. 21 hours C. 26 hours D. 25 hours

21. X can copy 80 pages in 20 hours; X and Y together can copy 135 pages in 27 hours. Then Y can copy 20 pages in
A. 20 hrs B. 24 hrs C. 30 hrs D. 42 hrs

22. A contractor undertakes a contract of 12 km long tunnel in 350 days with 45 workers. After 200 days he found that only 4.5 km tunnel has been finished. Find number of extra workers he must employee to finish the tunnel in time.
A. 100 B. 55 C. 45 D. 145

23. A contractor undertook to do a certain work in 75 days and employed 60 men to do it. After 25 days he found that only one-fourth of the work was done. How many more men must be employed in order that the work may be finished in time?
A. 34 B. 38 C. 35 D. 30

24. Ram and Shyam are working on an Assignment. Ram takes 6 hours to type 32 pages on a computer, while Shyam takes 5 hours to type 40 pages. How much time will they take working together on two different computers to type an assignment of 110 pages?
A. 7 hrs. 30 min B. 8 hrs. C. 8 hrs. 15 min. D. 8 hrs. 25 min

25. A machine P can print one lakh books in 8 hours; machine Q can print the same number of books in 10 hours while machine R can print them in 12 hours. All the machines are started at 9 A.M. while machine P is closed at 11 A.M. and the remaining two machines complete work. Approximately at what time will the work (to print one lakh books) be finished?
A. 11:30 am B. 12:00 noon C. 12:30 pm D. 1:00 pm

Competitive Level Problems

1. Sonu can do a piece of work in 20 days. He started the work and left after some days, when 25% work was done. After that Abhijeet joined and completed it working for 10 days. In how many days Sonu and Abhijeet can do the complete work, working together?

A. 6 B. 8 C.10 D. 12

2. A takes three times as long as B and C together to do a job. B takes four times as long as A and C together to do the work. If all the three, working together can complete the job in 24 days, then the number of days, A alone will take to finish the job is:

A. 100 B. 96 C. 95 D. 90

3. If A and B work together, they will complete a job in 7.5 days. However, if A works alone and completes half the job and then B takes over and completes the remaining half alone, they will be able to complete the job in 20 days. How long will B alone take to do the job if A is more efficient than B?

A. 20 days B. 40 days C. 36 days D. 30 days

4. Some carpenters promised to do a job in 9 days but 5 of them were absent and remaining men did the job in 12 days. The original number of carpenters was

A. 24 B. 20 C. 16 D. 18

5. A alone can do a piece of work in 6 days and B alone in 8 days. A and B undertook to do it for Rs. 3200. With the help of C, they completed the work in 3 days. How much is to be paid to C?

A. Rs. 375 B. Rs. 400 C. Rs. 600 D. Rs. 800

6. A can do a particular work in 6 days. B can do the same work in 8 days. A and B signed to do it for Rs. 3200. They completed the work in 3 days with the help of C. How much is to be paid to C?

A. Rs. 380 B. Rs. 600 C. Rs. 420 D. Rs. 400

7. 1 man or 2 women or 3 children can do a work in 55 days. Find in how many days 1 man and 1 woman and 1 child can do the work?

A. 30days B. 24days C. 25days D. 28days

8. 12 men complete a work in 9 days. After they have worked for 6 days, 6 more men join them. How many days will they take to complete the remaining work?

A. 6 B. 4 C. 2 D. 1

9. Ten men can finish a piece of work in 10 days, whereas it takes 12 women to finish it in 10 days. If 15 men and 6 women undertake the work, how any days will they take to complete it?

A. 3 days B. 4 days C. 5 days D. 6 days

10. 40 men can do a job in 40 days. They start together but after every 10 days 5 men left the job. In how many days work will be finished?

A. 56 days B. 57 days C. 56 and 1/3 days D. 56 and 2/3 days

Pipe & Cistern

1. A can fill a tank in 10 minutes. B can empty it in 15 minutes. If both the taps operate simultaneously, how much time is needed to fill the tank?
A.10 min B. 60 min C. 30 min D. 15 min

2. Three tapes A, B and C can fill an overhead tank in 4, 6 and 12 minutes respectively. How long would the three taps take to fill the tank if all of them are opened together?
A. 1 min B. 2 min C. 4 min D. 6 min

3. A water tank can be filled by a tap in 30 minutes and another tap can fill it in 60 minutes. If both the taps are kept open for 5 minutes and then the first tap is closed. How much time 2nd tap will take to fill the remaining tank?
A. 15 min B. 20 min C. 25 min D. 45 min

4. Two pipes P and Q can fill a tank in 24 minutes and 32 minutes respectively. If both the pipes are opened simultaneously, after how much time second pipe should be closed so that the tank is full in 18 minutes?
A. 4 min B. 8 min C. 12 min D. 16 min

5. A cistern has a leak which would empty it in 8 hrs. A tap is turned ON which admits 6L/min into cistern, now it would empty in 12 hrs. Find the capacity of cistern.
A. 144 L B. 1440 L C. 4320 D. 8640 L

6. A cistern has a leak which would empty it in 4 hrs. A tap is turned ON which admits 3 L/min into cistern, now it would empty in 6 hrs. Find the capacity of cistern.
A. 7200 L B. 2160 L C. 720 L D. 360 L

7 : Two pipes can fill a tank in 15 and 12 hrs resp. Third pipe can empty it in 4 hrs. If the pipes are open in the order of 8AM, 9AM and 11AM resp. How soon the tank will be empty?
A. 2 : 40 pm B. 3 : 40 pm C. 4 : 40 pm D. 3 : 20 pm

8. Two pipes can fill a tank in 3 and 4 hrs resp. Third pipe can empty it in 1 hrs. If the pipes are open in the order of 3, 4 and 5 pm resp. How soon the tank will be empty?
A. 2:12 pm B. 5: 12 pm C. 6:12 pm D. 7:12 pm

9. There are 6 filling pipes each can fill a tank in 16 minutes and 4 empty pipes each can empty same tank in 20 min . If all pipes are open together and as a result tank is filled by 14 L/min. Find capacity of tank.
A. 24 L B.40 L C. 80 L D. 84 L

10. A tank has two pipes, one can fill it in 45 min and other can empty it in 1 hr. How soon the tank will be full, if the pipes are open on alternate min.
A. 360 min B. 353 min C. 180 min D.176 min

11. A, B and C pipes are connected to a tank. A and B can fill it in 20 and 30 min resp. While C can empty it in 15 min. How soon the tank will be full, if the pipes are open on alternate min.
A. 55 min B. 52 min C. 165 min D. 167 min

12. Pipe A can fill the tank in 8 hours and pipe B can fill it in 12 hours. If pipe A is opened at 7:00 am and pipe B is opened at 9:00 am, then at what time will the tank be full?
A. 12:00 PM B. 12:30 PM C. 11:48 PM D. 12:36 PM

13. Two pipes can independently fill a bucket in 20 minutes and 25 minutes. Both are opened together for 5 minutes after which the second pipe is turned off. What is the time taken by the first pipe alone to fill the remaining portion of the bucket?
A. 11 min B. 16 min C. 20 min D. 15 min

14. Having the same capacity 9 taps fill up a water tank in 20 minutes. How many taps of the same capacity are required to fill up the same water tank in 15 minutes?
A. 10 B. 12 C. 15 D. 18

15. A cistern is provided with two pipes A and B. A can fill it in 20 minutes and B can empty it in 30 minutes. If A and B be kept open alternatively for one minute each, how soon will the cistern be filled?
A. 121 minutes B. 110 minutes C. 115 minutes D. 120 minutes

16. Two pipes A and B can fill a tank with water in 30 minutes and 45 minutes respectively. The third pipe C can empty the tank in 36 minutes. First A and B are opened. After 12 minutes C is opened. Total time (in minutes) in which the tank will be filled up is:
A. 12 min B. 24 min C. 30 min D. 36 min

17. Two pipes A and B can fill a tank in 15 hours and 20 hours respectively while a third pipe C can empty the full tank in 25 hours. All the three pipes are opened in the beginning. After 10 hours C is closed. Find, in how much time will the tank be full?
A. 12 hrs B. 8 hrs C. 10 hrs D. 14 hrs

18. Three pipes A, B and C can fill a tank in 6 minutes, 8 minutes and 12 minutes respectively. The pipe C is closed 6 minutes before the tank is filled. In what time will the tank be full?
A. 6 min B. 4 min C. 5 min D. Data inadequate

19. Two pipes A and B can fill a tank in 36 minutes and 48 minutes respectively. If both the pipes are opened simultaneously, after how much time should B be closed so that the tank is full in 27 minutes?
A. 10 min B. 12 min C. 14 min D. 16 min

20. 8 taps are fitted to a water tank. Some of them are water taps to fill the tank and the remaining are outlet taps used to empty the tank. Each water tap can fill the tank in 12 hours and each outlet tap an empty it in 36 hours. On opening all the taps, the tank is filled in 3 hours. Find the number of water taps.
A. 5 B. 4 C. 3 D. 2

TIME SPEED & DISTANCE

Speed

Speed basically tells us how fast or slow an object moves.

It is described as the distance travelled by an object divided with the time taken to cover that distance.

Speed = Distance/Time

This shows that Speed is directly proportional to distance but inversely proportional to time.

Distance = Speed * Time and,

Time = Distance/Speed

Example: What is the distance covered by a car travelling at a speed of 40 kmph in 15 minutes?

Solution:

Distance= speed* time= 40*15/60=10 km.

Average Speed

Case 1: When Time is Constant

The average speed of travelling at two different speeds for the same time span is just the simple average of two speeds.

Let Speed 1 be x km/hr. Let Speed 2 be y km/hr

Therefore,

Average Speed when time is same = (x+y)/2

Example: A car is travelling at an average speed of 45kmph for the 1st hour and at 65 kmph for the next 1 hour. Calculate his average speed.

Solution: As the time is same, i.e. 1 hour,

Average speed= (45+65)/2= 55 kmph.

Case 2: Average Speed When Distance is Constant

Average Speed = 2ab/(a+b) (where a and b are two speeds)

Example: On his way to office, Big Bull was travelling at 30 kmph and on the return journey, he was travelling at 45kmph. What is Big Bull's average speed?

Solution: 37.5 kmph is incorrect as the time travelled is different in both the cases and only the distances are same.

Let distance = x km

Therefore, Time taken on Big Bull's onward journey =x/30 hours and

Time taken on his return journey=x/45 hours

Therefore, total time = (x/30)+ (x/45) hours.

Total distance = 2x km

Average speed= 36kmph

Problems on Trains

Speed of the Train = Total distance covered by the train / Time taken

If the length of two trains is given, say a and b, and the trains are moving in opposite directions with speeds of x and y respectively, then the time taken by trains to cross each other = {(a+b) / (x+y)}

If the length of two trains is given, say a and b, and they are moving in the same direction, with speeds x and y respectively, then the time is taken to cross each other = {(a+b) / (x-y)}

When the starting time of two trains is the same from x and y towards each other and after crossing each other, they took t1 and t2 time in reaching y and x respectively, then the ratio between the speed of two trains = √t2 : √t1

If two trains leave x and y stations at time t1 and t2 respectively and travel with speed L and M respectively, then distanced from x, where two trains meet is = (t2 – t1) × {(product of speed) / (difference in speed)}

The average speed of a train without any stoppage is x, and with the stoppage, it covers the same distance at an average speed of y, then Rest Time per hour = (Difference in average speed) / (Speed without stoppage)

If two trains of equal lengths and different speeds take t1 and t2 time to cross a pole, then the time taken by them to cross each other if the train is moving in opposite direction = (2×t1×t2) / (t2+t1)

If two trains of equal lengths and different speeds take t1 and t2 time to cross a pole, then the time taken by them to cross each other if the train is moving in the same direction = (2×t1×t2) / (t2-t1)

Class Practice Problems

1. A train is moving with a speed of 90 km/h. Its speed is (in m/s)
A. 25 m/s B. 30 m/s C. 40 m/s D. 50 m/s

2. A train is moving with a speed of 30 m/s. Its speed is (in km/h)
A. 72 km/h B. 100 km/h C. 120 km/h D. 108 km/h

3. A train travels at 40 km/hr. How many meters will it travel in 18 seconds?
A. 210 m B. 200 m C. 250 m D. 350 m

4. 3 person A, B and C covers a distance at 10 km/hr ,12 km/hr and 15 km/hr. the average speed is:
A. 11 km/hr B. 12 km/hr C. 7 km/hr D. 13 km/hr

5. A man completes 30 km of a journey at 6 km/hr and the remaining 40 km of the journey in 5 hours. His average speed for the whole journey is
A. $6\frac{4}{11}$ km/hr B. 7 km/hr C. $7\frac{1}{2}$ km/hr D. 8 km/hr

6. A car covers a distance of 720 km at a constant speed. If the speed of the car would have been 10 km/hr more, then it would have taken 1 hr less to cover the same distance. What is the original speed of the car?
A. 90 km/hr B. 80 km/hr C. 85 km/hr D. 75 km/hr

7. A man covers 1/4 of his journey at 20 km/hr and the remaining at 30 km/hr. He takes 15 hours in total journey. The distance total journey is?
A. 400 km B. 460 km C. 440km D. 420 km

8. A student walks from his house at 10 km/hr and reaches his school late by 6 minutes. Next day, he increases his speed by 15 km/hr and reaches 4 minutes before school time. How far is the school from his house?
A. 12 km B. 8 km C. 5 km D. 10 km

9. Walking at 7/8 of its usual speed, a train is 10 minutes too late. Find its usual time to cover the journe
A. 60 min B. 70 min C. 50 min D. 40 min

10. The speed of A and B are in the ratio 3:4. A takes 20 minutes more than B to reach the destination. How much time will take A?
A. $1\frac{1}{3}$ hrs B. 2 hrs C. $1\frac{2}{3}$ hrs D. $2\frac{2}{3}$ hrs

11. The distance between two stations A and B is 440 km. A train starts at 4 p.m. from A and move towards B at an average speed of 40 km/hr. Another train starts B at 5 p.m. and moves towards A at an average speed of 60 km/hr. How far from A will the two trains meet and at what time?
A. 200, 8 p.m. B. 300, 9 p.m. C. 200, 9 p.m. D. 300, 8 p.m.

12. Excluding stoppages, the speed of a bus is 54 kmph and including stoppages, it is 45 kmph. For how many minutes does the bus stop per hour?
A. 8 minutes B. 10 minutes C. 12 minutes D. 14 minutes

13. A train can travel 50% faster than a car. Both start from 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. 130 kmph

14. 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 km/hr and the time of flight increased by 30 minutes. The duration of the flight is:
A. 1 hour B. 2 hours C. 3 hours D. 4 hours

15. 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. 16 km B. 4 km C. 12 km D. 10 km

16. A man on tour travels first 160 km at 64 km/hr and the next 160 km at 80 km/hr. The average speed for the first 320 km of the tour is:
A. 35.55 km/hr B. 36 km/hr C. 71.11 km/hr D. 71 km/hr

17. In covering a distance of 30 km, Abhay takes 2 hours more than Sameer. If Abhay doubles his speed, then he would take 1 hour less than Sameer. Abhay's speed is:
A. 5 kmph B. 6 kmph C. 6.25 kmph D. 7.5 kmph

18. Robert is travelling on his cycle and has calculated to reach point A at 2 P.M. if he travels at 10 kmph, he will reach there at 12 noon if he travels at 15 kmph. At what speed must he travel to reach A at 1 P.M.?
A. 8 kmph B. 11 kmph C. 12 kmph D. 14 kmph

19. Robert is travelling on his cycle and has calculated to reach point A at 2 P.M. if he travels at 10 kmph, he will reach there at 12 noon if he travels at 15 kmph. At what speed must he travel to reach A at 1 P.M.?
A. 9 km/hour B. 10 km/hour C. 11 km/hour D. 12 km/hour

20. A person travels from P to Q 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. 44 km/hour B. 46 km/hour C. 48 km/hour D. 50 km/hour

21. Two guns were fired from the same place at an interval of 13 minutes but a person in a train approaching the place hears the second report 12 minutes 30 seconds after the first. Find the speed of the train in m/s, supposing that sound travels 330 metres per second?
A. 12 m/s B. 13 m/s C. 14 m/s D. 13.2 m/s

22. A has covered 1/3 of total distance when his scooter failed. he parked it and cover the remaining distance by foot walking 22 times as much time as riding. How many times his riding speed more than his walking speed?
A. 9 B. 20 C. 19 D. 10

23. PQ is a tunnel. A dog sits at the distance of 5/ 11 of PQ from P. The train whistle coming from any end of the tunnel would make the dog run. If a train approaches P and dog runs towards P the train would hit the dog at P. If the dog runs towards Q instead, it would hit the dog at Q. Find ratio of speed of train and dog?
A. 5:2 B. 16:5 C. 11:1 D. 34:3

24. A police man was travelling @ 90kmph. He crosses a thief travelling @ 60kmph in opposite direction. He had to travel for another 6 minutes before he would U turn and chase the thief? After they crossed each other how long in minutes police will catch the thief?
A. 30 B. 36 C. 42 D. 45

25. A train reaches a station at a certain time and at a fixed speed. If the train had been 6 km/hr faster, it would have taken 4 hours less than the scheduled time. And, If the train were slower by 6 km/hr, then would have taken 6 hours more than the scheduled time. The length of journey is:
A. 700 B. 720 C. 740 D. 760

Tutorial Practice Problems

1. An athlete runs 200 meters race in 24 seconds. His speed is
A. 20 km/hr B. 24 km/hr C. 28.5 km/hr D. 30 km/hr

2. A man riding his bicycle covers 150 meters in 25 seconds. What is his speed in km/hr?
A. 20 km/hr B. 21.6 km/hr C. 23 km/hr D. 25km/hr

3. In what time can Sonali cover a distance of 400 m, if she runs at a speed of 20 km/hr?
A. $1\frac{1}{5}$ min B. $1\frac{1}{2}$ min C. 2 min D. 3 min

4. A person starting from his house covers a distance at 20 km/hr and returns to the starting place at 30 km/hr. His average speed during whole journey is
A. 25 km/hr B. 24 km/hr C. 27 km/hr D. 22 km/hr

5. A person starting from his house covers a distance at 15 km/hr and returns to the starting place at 10 km/hr. His average speed during whole journey is
A. 11 km/hr B. 12 km/hr C. $7\frac{1}{2}$ km/hr D. 13 km/hr

6. A train travelled at an average speed of 100 km/hr, 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 hours 24 mins B. 6 hours 21 mins C. 6 hours 18 mins D. 6 hours 15 mins

7. 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

8. A man covers 1/3 of his journey at 40 km/hr and the remaining at 20 km/hr. He takes 15 hours in total journey. The distance total journey is?
A. 300 km B. 360 km C. 240km D. 120 km

9. If a student walks from his house to school at 5km/hr, he is late by 30 minutes. However, if he walks at 6 km/hr, he is late by 5 minutes only. The distance of his school from his house is
A. 2.5 km B. 3.6 km C. 5.5 km D. 12.5 km

10. The distance between two stations A and B is 365 km. A train starts at 10 a.m. from A and move towards B at an average speed of 65 km/hr. Another train starts B at 11 a.m. and moves towards A at an average speed of 35 km/hr. How far from B will the two trains meet and at what time?
A. 105, 2 p.m. B. 100, 4 p.m. C. 100, 2 p.m. D. 105, 5 p.m.

11. A train without stoppages travels at the rate of 50 km/hr and stoppages it travels at 45 km/hr. How many minutes does train stop on an average per hour?
A. 5 min B. 6 min C. 8 min D. 10 min

12. An aeroplane covers a certain distance at a speed of 240 kmph in 5 hours. To cover the same distance in 1 hour, it must travel at a speed of:
A. 300 kmph B. 360 kmph C. 600 kmph D. 1200 kmph

13. 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

14. A man completes 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. 220 km B. 224 km C. 230 km D. 234 km

15. A car travelling with 2/3 of its actual speed covers 42 km in 1 hr 40 min 48 sec. find the actual speed of the car.
A. 11 km/hr B. 25 km/hr C. 55 km/hr D. 37.5 km/hr

16. It takes eight hours for a 600 km journey, if 120 km is done by train and the rest by car. It takes 20 minutes more, if 200 km is done by train and the rest by car. The ratio of the speed of the train to that of the cars is:
A. 2: 3 B. 3: 2 C. 3: 4 D. 4: 3

17. A farmer travelled a distance of 61 km in 9 hours. He travelled partly on foot @ 4 km/hr and partly on bicycle @ 9 km/hr. The distance travelled on foot is:
A. 14 km B. 15 km C. 16 km D. 17 km

18. A man covered a certain distance at some speed. Had he 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. The distance (in km) is:
A. 35 B. 36 C. 37 D. 40

19. A man in a train notices that he can count 41 telephone posts in one minute. If they are known to be 50 meters apart, then at what speed is the train travelling?
A. 60 km/hr B. 100 km/hr C. 110 km/hr D. 120 km/hr

20. The distance between two cities A and B is 330 Km. A train starts from A at 8 a.m. and travel towards B at 60 km/hr. Another train starts from B at 9 a.m. and travels towards A at 75 Km/hr. At what time do they meet?
A. 10 am B. 11 am C. 12 pm D. 1pm

21. Bus B left town P for town Q at 6 a.m.@ 36kmph. While another bus C left town Q for town P at 7: 30 a.m. @24kmph. At what would they be 12 km apart of distance between P and Q is 72km?
A. 7:32 a.m. B. 7:36 a.m. C. 7:40 a.m. D. 7:48 a.m.

22. A father starts from home at 3:00 p.m. to pick his son from school at 4 pm. One day the school got over early, at 3:00 p.m. The son starts walking home. He met his father on the way and both returned 15 minutes early then the usual time. If speed of father is 35kmph then find speed of son in kmph?
A. 4 B. 5 C. 6 D. 7

23. Two men A and B started walking towards each other's starting point simultaneously from two points X and Y which are 12 km apart. They meet after 1 hr. After meeting A increased his speed by 6kmph. B reduced his speed by 6 kmph. They arrived at their destinations simultaneously. Find the initial speed of A?
A. 2 kmph B. 3 kmph C. 4 kmph D. 5 kmph

24. A thief is spotted by a policeman from a distance of 100 m. When the policeman starts the chase, the thief also starts running. If the speed of the thief 8 km/hr and that of the policeman 10 km/hr, how far the thief will have run before he is overtaken?
A. 200 m B. 300 m C. 400 m D. 500 m

25. A train after running 100 km meet with an accident and then run at 3/5th of its former speed and reaches the destination late by 48 min. If the accident had happened 30 km further it will be late by 24 min. Find speed of train.
A. 125 km/hr B. 150 km/hr C. 100 km/hr D. 50 km/hr

Competitive Level Problems

1. Two friends A and B simultaneously start running around a circular track. They run in the same direction. A travels at 6 m/s and B runs at b m/s. If they cross each other at exactly two points on the circular track and b is a natural number less than 30, how many values can b take?
A. 3 B. 4 C. 7 D. 5

2. Three cars leave A for B in equal time intervals. They reach B simultaneously and then leave for Point C which is 240 km away from B. The first car arrives at C an hour after the second car. The third car, having reached C, immediately turns back and heads towards B. The first and the third car meet a point that is 80 km away from C. What is the difference between the speed of the first and the third car?
A. 60 kmph B. 20 kmph C. 40 kmph D. 80 kmph

3. Three friends A, B and C decide to run around a circular track. They start at the same time and run in the same direction. A is the quickest and when A finishes a lap, it is seen that C is as much behind B as B is behind A. When A completes 3 laps, C is the exact same position on the circular track as B was when A finished 1 lap. Find the ratio of the speeds of A, B and C?
A. 5 : 4 : 2 B. 4 : 3 : 2 C. 5 : 4 : 3 D. 3 : 2 : 1

4. Mr. X decides to travel from Delhi to Gurgaon at a uniform speed and decides to reach Gurgaon after T hr. After 30 km, there is some engine malfunction and the speed of the car becomes $(4/5)^{th}$ of the original speed. So, he travels the rest of the distance at a constant speed $(4/5)^{th}$ of the original speed and reaches Gurgaon 45 minutes late. Had the same thing happened after he travelled 48 km; he would have reached only 36 minutes late. What is the distance between Delhi and Gurgaon?
A. 90 km B. 120 km C. 20 km D. 40 km

5.Tom, Jerry and Bill start from point A at the same time in their cars to go to B. Tom reaches point B first and turns back and meets Jerry at a distance of 9 miles from B. When Jerry reaches B, he too turns back and meets Bill at a distance of 7 miles from B. If 3 times the speed with which Tom drives his car is equal to 5 times Bill's speed, what could be the distance between the points A and B?
A. 40 miles B. 24 miles C. 31 miles D. 63 miles

6. A bus starts from a bus stop P and goes to another bus stop Q. In between P and Q, there is a bridge AB of certain length. A man is standing at a point C on the bridge such that AC: CB = 1:3. When the bus starts at P and if the man starts running towards A, he will meet the bus at A. But if he runs towards B, the bus will overtake him at B. Which of the following is true?
A. Bus travels 3x times faster than the man
B. Bus travels 2x times faster than the man
C. The bus and the man travel at the same speed
D. 4x the speed of the man is equal to 3x the speed of the bus

7. If the train had been 10 km/hr faster, it would have taken 2 hours less than the scheduled time. And, If the train were slower by 12 km/hr, then would have taken 3 hours more than the scheduled time. The length of journey is:
A. 2000 B. 2200 C. 2400 D. 2600

8. Cities M and N are 600km apart. Bus A starts from city M towards N at 9AM and bus B starts from city N towards M at the same time. Bus A travels the first one-third of the distance at a speed of 40kmph, the second one-third at 50kmph and the third one-third at 60kmph. Bus B travels the first one-third of the total time taken at a speed of 40kmph, the second one-third at 50kmph and the third one-third at 60kmph. When and where will the two buses cross each other?
A. 300 kms from M B. 280 kms from M C. 305 kms from M D. 295 kms from M

9. Distance between two stations A and B is 208 km. A train starts from station A at 10 AM with 30 km/h and another starts from B at 1:20 noon with 24 km/h. When the train will meet and how far from station A?
A. 2:20 PM, 120 km B. 3:20 PM, 160 km C. 2:20 PM, 160 km D. 3:20 PM, 120 km

10. A train leaves Delhi at 6 AM and reaches Agra at 10 AM. Another train leaves Agra at 8 AM and reaches Delhi at 11:30 AM. At what time the trains will cross each other?
A. 8 : 32 AM B. 8 : 48 AM C. 8 : 52 AM D. 8 : 56 AM

PROBLEMS ON TRAINS

1. A train running at the speed of 60 km/hr crosses a pole in 9 seconds. What is the length of the train?
A. 120 m B. 180 m C. 324 m D. 150 m

2. The length of the bridge, which a train 130 metres long and travelling at 45 km/hr can cross in 30 seconds, is:
A. 200 m B. 225 m C. 245 m D. 250 m

3. A train 240 m long passes a pole in 24 seconds. How long will it take to pass a platform 650 m long?
A. 65 sec B. 89 sec C. 100 sec D. 150 sec

4. A train passes a station platform in 36 seconds and a man standing on the platform in 20 seconds. If the speed of the train is 54 km/hr, then what is the length of the platform?
A. 200 m B. 240 m C. 300 m D. 864 m

5. A 300-meter-long train crosses a platform in 39 seconds while it crosses a signal pole in 18 seconds. What is the length of the platform?
A. 150 m B. 200 m C. 350 m D. 400 m

6. The length of a train and that of a platform are equal. If with a speed of 90 k/hr, the train crosses the platform in one minute, then the length of the train (in meters) is:
A. 850 B. 525 C. 550 D. 750

7. A train crosses a platform of 120 m in 15 sec; same train crosses another platform of length 180 m in 18 sec. then find the length of the train?
A. 175 m B. 180 m C. 185 m D. 170 m

8. A train can cross 162m long platform in 18 sec and 120m long platform in 15 sec then find the length of train.
A. 100m B. 90m C. 120m D. None of these

9. A train 125 m 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 km/hr B. 50 km/hr C. 54 km/hr D. 55 km/hr

10. A train 110 metres long is running with a speed of 60 kmph. In what time will it pass a man who is running at 6 kmph in the direction opposite to that in which the train is going?
A. 5 sec B. 6 sec C. 7 sec D. 10 sec

11. The two trains of lengths 400 m, 600 m respectively, running at same directions. The faster train can cross the slower train in 180 sec, the speed of the slower train is 48 km. then find the speed of the faster train?
A. 58 Kmph B. 68 Kmph C. 78 Kmph D. 55 Kmph

12. Two trains, each 100 m long, moving in opposite directions, cross each other in 8 seconds. If one is moving twice as fast the other, then the speed of the faster train is:
A. 30 Kmph B. 45 Kmph C. 60 Kmph D. 75 Kmph

13 Two trains are running in opposite directions with the same speed. If the length of each train is 120 metres and they cross each other in 12 seconds, then the speed of each train (in km/hr) is:
A. 10 Kmph B. 18 Kmph C. 36 Kmph D. 72 Kmph
14. A jogger running at 9 kmph alongside a railway track in 240 metres ahead of the engine of a 120 metres long train running at 45 kmph in the same direction. In how much time will the train pass the jogger?
A. 3.6 sec B. 18 sec C. 36 sec D. 72 sec

15. Two trains running in opposite directions cross a man standing on the platform in 27 seconds and 17 seconds respectively and they cross each other in 23 seconds. The ratio of their speeds is:
A. 1 : 3 B. 3 : 2 C. 3 : 4 D. None of these

16. Two trains travel in the same direction at 56 kmph and 29 kmph respectively. The faster train passes a man in the slower train in 16 seconds. Find the length of the faster train. (all in meter)
A. 432 B. 80 C. 150 D. 120

17. The length of two trains is 250m and 300m respectively. Their speeds are 70 kmph and 79 kmph and both are running in same direction then find the time in which faster moving train can cross a person who is sitting in slow moving train.
A. 120 sec B. 90 sec C. 110 sec D. None of these

18. A train overtakes two persons who are walking in the same direction in which the train is going, at the rate of 2 kmph and 4 kmph and passes them completely in 9 and 10 seconds respectively. The length of the train is:
A. 45m B. 50m C. 54m D. 72m

19. A train travelling with 54kmph takes 20 sec to cross the bridge. Another train 70 metre shorter crosses the same bridge at 36kmph. Find the time taken by the second train to cross the bridge.
A. 23 sec B. 24 sec C. 25 sec D. 26 sec

20. Two trains are moving in opposite direction having speed in the ratio 5:7. First train crosses a pole in 12 sec and the second train crosses the same pole in 15 sec. Find the in which they can cross each other completely.
A. 55/4 sec B. 53/4 sec C. 57/4 sec D. 59/4 sec

21. A 270m long train running at the speed of 120 kmph crosses another train running in opposite direction at the speed of 80 kmph in 9 second. What is the length of other train?
A. 180m B. 230m C. 245m D. 235m

22. Two, trains, one from Howrah to Patna and the other from Patna to Howrah, 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. 4: 3 C. 6: 7 D. 9: 16

23. A train running at 45 kmph takes 36 sec to pass a platform. Next, the train takes 12 sec to pass a man walking at the speed of 15 kmph in the same direction. Find the length of platform.
A. 250m B. 300m C. 350m D. 400m

24. Two trains of length 100m and 125m are travelling at a speed of 45kmph and 60kmph 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

25. Two stations A and B are 110 km apart on a straight line. One train starts from A at 7 a.m. and travels towards B at 20 kmph. Another train starts from B at 8 a.m. and travels towards A at a speed of 25 kmph. At what time will they meet?
A. 9 a.m. B. 10 a.m. C. 10.30 a.m. D. 11 a.m.

26. A train has 20 compartments and an engine. Length of each compartment is 10m and length of engine is 15m. The gap between engine and compartment and between each compartment is 1m; the speed of train is 60 kmph and can cross a platform in 90 sec. find the length of platform.
A. 1265m B. 1250m C. 1320m D. None of these

27. A train can cross a person who is running with a speed of 6 kmph in the same direction. The person can see the train for 2 minutes and after that the train becomes out of sight and at that moment the distance between train and that person is 1.2 km then find the speed of train.
A. 52 kmph B. 40 kmph C. 42 kmph D. None of these

28. Two stations P and Q are 400 km apart from each other. One train starts from P at a speed of 60 kmph towards Q and after 2 hr another train starts from Q towards P at 45 kmph. At what distance from P the train will meet.
A. 220 km B. 240 km C. 260 km D. 280 km

29. Two trains A and B start from Howrah and Patna towards Patna and Howrah respectively at the same time. After passing each other they take 4 h 48 min and 3 h 20 min to reach Patna and Howrah respectively. If the train from Howrah is moving at 45 km/h, then the speed of the other train is

A. 60 km/h B. 45 km/h C. 35 km/h D. 54 km/h

30. A train passes two persons walking in the same direction at a speed of 3 km/hr and 5 km/hr respectively in 10 seconds and 11 seconds respectively. The speed of the train is

A. 28 kmph B. 27 kmph C. 25 kmph D. 24 kmph

BOATS & STREAMS

Stream – The moving water in a river is called a stream.

Upstream – If the boat is flowing in the opposite direction to the stream, it is called upstream. In this case, the net speed of the boat is called the upstream speed

Downstream – If the boat is flowing along the direction of the stream, it is called downstream. In this case, the net speed of the boat is called downstream speed

Still Water – Under this circumstance the water is considered to be stationary and the speed of the water is zero

Upstream = (u−v) km/hr, where "u" is the speed of the boat in still water and "v" is the speed of the stream

Downstream = (u+v) Km/hr, where "u" is the speed of the boat in still water and "v" is the speed of the stream

Speed of Boat in Still Water = ½ (Downstream Speed + Upstream Speed)

Speed of Stream = ½ (Downstream Speed – Upstream Speed)

Average Speed of Boat = {(Upstream Speed × Downstream Speed) / Boat's Speed in Still Water}

Class Practice Problems

1. In one hour, a boat goes 11 km/hr along the stream and 5 km/hr against the stream. The speed of the boat in still water (in km/hr) is:
A. 3 kmph B. 5 kmph C. 8 kmph D. 9 kmph

2. A boat running downstream covers a distance of 16 km in 2 hours while for covering the same distance upstream, it takes 4 hours. What is the speed of the boat in still water?
A. 4 kmph B. 6 kmph C. 8 kmph D. Data inadequate

3. A motor boat takes 12 hours to go downstream and it takes 24 hours to return the same distance. what is the time taken by boat in still water?
A. 15 hr B. 16 hr C. 8 hr D. 20 hr

4. The current of a stream at 1 kmph. A motor boat goes 35 km upstream and back to the starting point in 12 hours. The speed of the motor boat in still water is?
A. 8 kmph B. 6 kmph C. 7.5 kmph D. 5.5 kmph

5. A man goes down stream with a boat to some destination and returns upstream to his original place in 5 hours. If the speed of the boat in still water and the stream are 10km/hr and 4km/hr respectively, the distance of the destination from the string place is
A. 16 km B. 18 km C. 21 km D. 25 km

6. A man swims downstream 72 km and upstream 45 km taking 9 hours each time; what is the speed of the current?
A. 1 kmph B. 3.2 kmph C. 1.5 kmph D. 2 kmph

7. 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 kmph B. 9 kmph C. 10 kmph D. 12.5 kmph

8. 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. 2 : 1 B. 3 : 1 C. 3 : 2 D. 4 : 3

9. A motorboat, whose speed in 15 km/hr in still water goes 30 km downstream and comes back in a total of 4 hours 30 minutes. The speed of the stream (in km/hr) is:
A. 4 B. 5 C. 6 D. 10

10. A motorboat takes half time to cover a certain distance downstream than upstream. What is the ratio between rate of current and rate of boat in still water?
A. 1 : 3 B. 3 : 2 C. 2 : 3 D. 3 : 1

11. Find the speed of stream if a boat covers 36 km in downstream in 6 hours which is 3 hours less in covering the same distance in upstream?
A. 1.5 kmph B. 1 kmph C. 0.75 kmph D. 0.5 kmph

12. A man rows to a place 48 km distant and come 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. The rate of the stream is:
A. 1 kmph B. 1.5 kmph C. 2 kmph D. 2.5 kmph

13. Choose the most appropriate answer: A boat travels upstream from B to A and downstream from A to B in 3 hours. If the speed of the boat in still water is 9 Km/h and the speed of the current is 3 Km/h, the distance between A and B is
A. 9 km B. 10 km C. 11 km D. 12 km

14. 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. Cannot be determined

15. A river runs at 4 km/hr. if the time taken by a man to row is boat upstream is thrice as the time taken by him to row it downstream then find the speed of the boat in still water.
A. 16 kmph B. 8 kmph C. 6 kmph D. 12 kmph

16. A man can row downstream at 12 Kmph and upstream at 8 Kmph. Find the ratio of the speed of the current to the speed of the man in still water?
A. 1 : 5 B. 5 : 24 C. 25: 16 D. 16 : 25

17. A man can row 40 km upstream and 55 km downstream in 13 hours. Also, he can row 30 km upstream and 44 km downstream in 10 hours. Find the speed of the man in still water?
A. 3 kmph B. 8 kmph C. 5 kmph D. 11 kmph

18. A boat can cover 48 km upstream and 72 km downstream in 12 hours. Also, boat can row 72 km upstream and 48 km downstream in 13 hours. Find the speed of current?
A. 3 kmph B. 8 kmph C. 2 kmph D. 12 kmph

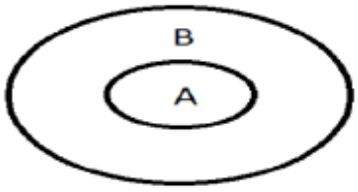
19. A boat took 8 hr less to travel a distance downstream than to travel the same distance upstream. If the speed o a boat in steel water is 9 km/hr and speed of stream is 3 km/hr. In total how much distance travelled by boat?
A. 96 km B. 144 km C. 164 km D. 192 km

20. A boat can travel 15 km downstream in 18 min. The ratio of speed boat in steel water to the speed of stream is 4:1. How much time will the boat take to cover 10 km upstream?
A. 22 min B. 25 min C. 20 min D. 33 min

SYLLOGISM

The term syllogism means inference or conclusion drawn from the statements In syllogism, a statement of certain relation between two or more terms is analogous to a sentence is grammar. The proposition consists of three parts, namely subject, predicate and copula. 1. Subject: The subject is about which something is said. 2. Predicate: The predicate is the part of the proposition denoting which is affirmed or denied about the subject. 3. Copula: The copula is that part of the proposition which denotes the relation between the subject and the predicate. 4. Example: Consider the proposition 'Man is intelligent'. Here the information is given about the man. So 'Man' is the subject. 'Intelligent' is the quality affirmed for this subject. So it is the predicate. 'Is' denotes the relation between the subject and the predicate. So, it is the copula.

CONCEPT 1 – All A is B

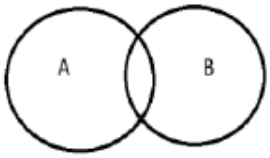


The Possible conclusions are:

1) All A is B.
2) Some A is B.
3) Some B is A.

CONCEPT 2 - Some A is B.

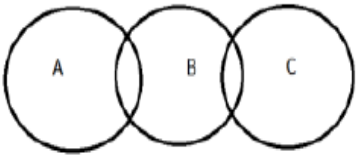
The Diagram for Some A is B is



The possible conclusions are:

1) Some A is B
2) Some B is A

CONCEPT 3 – Some A is B and Some B is C



Now the Possible Conclusions are:

Between A and B	Between B and C
Some A is B	Some B is C
Some B is A	Some C is B

There is no DIRECT CONNECTION between A and C.

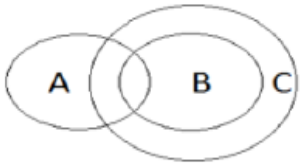
So it is not possible to derive any conclusion between

CONCEPT 4 – All A is B and All B is C

The Conclusions are:

Between A & B	Between B & C	Between A & C
All A is B.	All B is C.	All A is C.
Some A is B.	Some B is C.	Some A is C.
Some B is A.	Some C is B.	Some C is A.

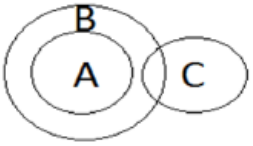
Concept 5 – Some A is B, All B is C.



The possible conclusions are:

Between A&B	Between B&C	Between A&C
Some A is B	All B is C	Some A is C
Some B is A	Some B is C	Some C is A
	Some C is B	

Concept 6 – All A is B and Some B is C

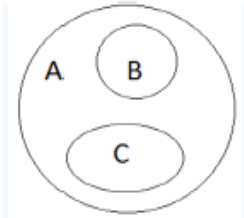


The possible conclusions are:

Between A and B	Between B and C
All A is B	Some B is C
Some A is B	Some C is B
Some B is A	

There is no DIRECT CONNECTION between A and C.
So it is not possible to derive any conclusion between A and C.

Concept 7 – All B is A and All C is A



The Possible Conclusions are:

Between A and B	Between A and C
All B is A	All C is A
Some B is A	Some C is A
Some A is B	Some A is C

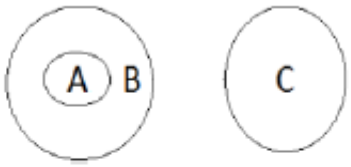
There is no DIRECT CONNECTION between B and C.
So it is not possible to derive any conclusion between B and C.

Concept 8 – No A is B

The Possible Conclusions are:

- No A is B
- No B is A
- Some A is not B
- Some B is not A

Concept 9 – All A is B and No B is C



The Possible Conclusions are:

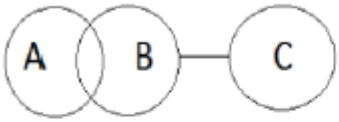
Between A & B	Between B & C	Between A & C
All A is B	No B is C	No A is C
Some A is B	No C is B	Some A is Not C
Some B is A	Some B is not C	

Concept 10 – All A is B and No A is C

The Possible Conclusions are:

Between A&B	Between A & C	Between B & C
All A is B	No A is C	Some B is not C
Some A is B	No C is A	
Some B is A	Some A is not C	

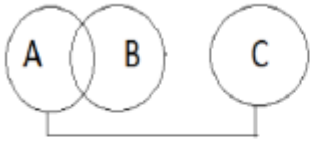
Concept 11 – Some A is B; No B is C



The Possible Conclusions are:

Between A & B	Between B & C	Between A & C
Some A is B	No B is C	Some A is not C
Some B is A	No C is B	
	Some B is not C	
	Some C is not B	

Concept 12 – Some A is B; No A is C



The Possible Conclusions are:

Between A & B	Between A & C	Between B & C
Some A is B	No A is C	Some B is not C
Some B is A	No C is A	
	Some A is not C	
	Some C is not A	

Class Practice Problems

Directions (Questions 1-5): Given two statements, verify the conclusions and mark the answer as given below:
Mark (A) if only conclusion I follows.
Mark (B) if only conclusion II follows.
Mark (C) if both conclusions I & II follow.
Mark (D) if no conclusion follows.

1. **Statements:** All locks are keys. All keys are bats.
Conclusions:

I. Some bats are locks
II. Some locks are keys

2. Statements: Some cups are pots.
All pots are tubes.
Conclusions:
I. Some pots are cups.
II. Some tubes are cups.

3. Statements: All bags are books. Some purses are bags.
Conclusions:
I. Some books are purses.
II. Some books are bags

4. Statements: Some cars are jeeps. All pens are cars.
Conclusions:
I. No pen is jeep
II. Some jeeps are cars.

5. Statements: Some cats are dogs. No dog is cow.
Conclusions:
I. No cow is cat.
II. No dog is cat.

Directions (Q. Nos. 6 – 8) two statements are given in each of the following questions, followed by two conclusions I and II. You must take the two statements to be true even if they seem to be at variance from commonly known facts. Read the conclusions and then decide which of the given conclusion logically follows the given two statements, disregarding the known facts. Give answer
(A) If only conclusion I follows
(B) If only conclusion II follows
(C) If both conclusions I and II follow
(D) If none of the conclusion follows
6. Statements: I. All Sunday are Monday II. All Monday are Tuesday
Conclusions
I. No Tuesday is Sunday
II. All Tuesday are Monday

7. Statements: I. All writers are lawyers. II. All readers are lawyers.
Conclusions: I. Some lawyers are readers.
II. Some readers are writers.

8. Statements: I. All players are doctors. II. Some doctors are actors.
Conclusions: I. some doctors are players as well as actors.
II. All actors are doctors.

9. Statements: Some Cats are Rats. All bats are tables. All Rats are Bats.
Conclusion: I. Some Cats are bats
II. All bats are rats
III. All tables are cats
IV. All bats are cats
A. Only I & II follow
B. Only II follows
C. Only I & IV follow
D. None of these

10. Statements: Some ships are boats. All boats are submarines. Some submarines are yatches.
Conclusion: I. Some yatches are boats
II. Some submarines are boats

III. Some submarines are ships
IV. Some yatches are ships
A. All follow
B. Only II and III follow
C. Only III follows
D. Only IV follows

11. Statements: All Carrots are birds. Some telephones are Carrots. All bedsheets are telephone.
Conclusion:
I. All bedsheet are birds
II. Some bedsheet are birds
III. Some birds are telephone
IV. All telephone are birds
A. Only I follows
B. Only II follows
C. Only I and III follow
D. Only III follows

12. Statements: Most CPUs are keyboards. No keyboard is a Mouse. All Mouses are CPU.
Conclusion: I. Some keyboards are CPU
II. All CPU's are Mouse
III. No Mouse is a keyboard
IV. Some Mouse are keyboard
A. Only I follows
B. Only II and III follow
C. Only I and III follow
D. Only II follows

13. Statements: Samosas are Jalebi. All Jalebis are Tikki. All Tikkis are Barfi
Conclusion: I. All Jalebis are Barfi
II. All Tikkis are Samosas
III. All Samosas are Barfi
IV. All Barfi are Jalebi
A. Only I and II follow
B. Only I and III follow
C. Only II and III follow
D. All follow

14. Statements: Some eyes are ears. Some ears are lungs. All lungs are hands
Conclusion:
I. Some hands are eyes.
II. Some hands are ears
III. Some lungs are eyes
IV. No hand is eye
A. None follow
B. Only IV follows
C. Only II follows
D. Only III follows

15. Statements: All liquids are solids. Some solids are gases. All gases are clouds
Conclusion: I. Some clouds are solids
II. Some clouds are liquids
III. Some gases are liquids
IV. Some solids are clouds
A. None follows
B. Only I and II follow
C. Only III and IV follow

D. Only I and IV follow

16. Statements: All Gold are Platinum. No Platinum is silver. Some Diamonds are silver.
Conclusion: I. Some Diamonds are Gold
II. Some Diamonds are Platinum
III. Some Gold are Silver
IV. No Silver is Gold
A. Only I follow
B. Only III follows
C. Only IV follows
D. Only II and IV follow

17. Statements: Some messages are WhatsApp. All Hikes are WhatsApp. All WhatsApp are Facebook.
Conclusion:
I. Some Facebook are messages
II. All hikes are Facebook
III. Some messages are hikes
IV. Some message are Facebook
A. All follow
B. Only I, II and III follow
C. Only I, II and IV follow
D. Only III and IV follow

18. Statements: No watch is cycle. No cycle is Motorbike. Some auto are motorbike
Conclusion:
I. No Motorbike is watch
II. No motor bike is cycle
III. Some cycles are watches
IV. All Motorbikes are watches
A. None follows
B. Only I follows
C. Only I and III follow
D. None of these

19. Statements: (I) Some Potatoes are onions. (II) All onions are peanuts. (III) All peanuts are samosas
Conclusion: (I) Some potatoes are peanuts
(II) Some peanuts are potatoes
(III) All onions are samosas
A. All follow
B. Only I, III follow
C. Only I, II follow
D. Only II, III, follow

20. Statements: (I) some red are blue. (II) Some blue are grey. (III) All grey are white.
(IV) No white is black.
Conclusions:
(I) No black is grey.
(II) Some blue are white.
(III) Some black are red.
(IV) No black is red.
A. Only I and II follow
B. Only either III or IV follows
C. Only I, II and either III or IV follow
D. Only I and either III or IV follow

21. Statements: Some tumblers are plates. Some bottles are tumblers. All plates are spoons.
Conclusions:

I. Some spoons are tumblers
II. Some spoons are plates
III. Some bottles are plates
IV. No bottle is a plate
A. Only I & II follows
B. Either III or IV follow
C. All follow
D. None of these

22. Statements: All speeches are translations. All essays are speeches. No essays are reviews.
Conclusions:
I. Some reviews are speeches
II. No reviews are essays
III. No reviews are translation
IV. No review are speeches
A. All follow
B. None of these
C. Either I or II follow.
D. Either I or IV and II follows

23. Statements: No navies are air forces. All armies are navies. All air forces are defences.
Conclusions:
I. No air forces are navies
II. Some defences are airforces
III. Some defences are not navies
IV. No armies are air forces
A. Only either I or II follows
B. Only II follows
C. Only either I or IV follows
D. All follows

24. Statements: Some cats are white. Some white are dog. All dogs are blue.
No dog is monkey. All monkeys are tall.
Conclusion:
I. Some tall is not dog.
II. Some cat is dog.
III. All blue being monkeys is a possibility.
A. Only I
B. I and III
C. II and III
D. Only II

25. Statements:
I. No black is orange. II. All yellow is orange.
III. Some yellow is green. IV. All green is pink.
Conclusion:
I. Some orange are pink.
II. All orange being yellow is a possibility.
III. Some green is not black.
A. Only I.
B. Only III.
C. I and III.
D. All follow

Tutorial Practice Problems

Directions (Questions 1-5): Given two statements, verify the conclusions and mark the answer as given below:
Mark (A) if only conclusion I follows.

Mark (B) if only conclusion II follows.
Mark (C) if both conclusions I & II follow.
Mark (D) if no conclusion follows.

1. Statements: Some Goats are Birds. All Cars are Goats.
Conclusions:
I. Some Cars are Birds. II. No Bird is Goat.

2. Statements: All Grapes are Bananas. All Bananas are Potatoes.
Conclusions:
I. Some Potatoes are Bananas.
II. Some Grapes are Potatoes.

3. Statements: Some Cats are Rats. Some Rats are Ants.
Conclusions:
I. No Rat is Ant.
II. No Cat is Ant.

4. Statements: All chalks are Dusters. Some Chalks are Boards.
Conclusions:
I. Some Dusters are Boards.
II. Some Chalks are Dusters.

5. Satements: Some Bags are Books. All Books are Boxes.
Conclusions:
I. All Bags are Boxes.
II. No Book is Boxes.

6. Statements: All roots are stems. Some branches are trees. Some stems are branches.
Conclusions:
I. Some trees are stems
II. Some trees are branches
III. All trees are stems
IV. Some trees are not branches
A. Only I, II & III follow
B. Only I & II follow
C. Only I follows
D. Only II follow

7. Statements: All clouds are stars. No stars are planets. Some clouds are satellites.
Conclusions:
I. No planet is cloud
II. Some satellites are stars
III. Some planets are not satellites
IV. Some satellites are not planets
A. Only II follows
B. Only I & II follows
C. Only I, II & IV follows
D. All follows

8. Statements: No mat is fan. Some fans are cars. All cars are shirts.
Conclusions: I. All mats are cars
II. All shirts are cars
III. Some shirts are fans
IV. No shirt is a mat
A. Only either II or IV and III follow
B. Only I and II follow
C. Only IV follow
D. Only III follow

9. Statements: Some clips are copies. Some copies are magazines. No magazines is a dictionary
Conclusions: I. No copies are dictionary
II. Some copies are dictionary
III. Some copies are not dictionary
IV. No clips are magazines
A. Only III follows
B. Only either I or II & III follow
C. Only I follows
D. Only either I or II follows

10. Statements: Some headphones are earphones
All earphones are telephones.
No telephones are television
Conclusions: I. No earphones are television
II. Some headphones are not television
III. Some headphones are telephones
IV. Some telephones are not television
A. All follow
B. Only I, II & III follow
C. Only II, III & IV follow
D. Only I, III & IV follow

11. Statements: All pens are pencil. All pencils are eraser.Some erasers are colour. Some colours are brush.
Conclusion:
I. All erasers are pen.
II. Some brush is pencil.
III. Some erasers are not colour.
A. I and III.
B. Only III.
C. II and III.
D. None follows

12. Statements: Some Hen are Peacock. Some Peacock are Crow. No Crow is parrot.
Conclusions:
I. All Hen being parrot is a possibility.
II. At least some peacock is parrot.
A. Neither I nor II follow.
B. I and II follow.
C. Only I follow.
D. Either I or II follow.

13. Statements: No A is C. All B is C. No B is D.
Conclusions:
I. Some C is definitely not D.
II. All B is not A.
A. Neither I nor II follow.
B. I and II follow.
C. Only I follow.
D. Either I or II follow.

14. Statements:
Some Shirts are Skirts. Some Skirts are Buttons. All Trousers are Buttons.
Conclusions:
I. Some Skirt are Trousers.
II. All Trousers being Shirt is a possibility.
A. Neither I nor II follow.

B. I and II follow.
C. Only I follow.
D. Only II follow

15. Statements: All Wallet is Pocket. All Money is Pocket. Some Pocket is Rupees. No Rupees is Note.
Conclusions:
I. Some Rupees is Wallet.
II. Some Pocket is not Note.
III. All Wallet being Note is a possibility.
IV. Some Money is Rupees.
A. If only conclusion II follows.
B. If conclusion II and conclusion III follows.
C. None conclusion follows.
D. If Either conclusion I or conclusion III follows.

16. Statements: All Even are Odd. All Composite are Prime. No Odd is Prime. Some Odd are Whole.
Conclusions:
I. All even are not Composite.
II. No Prime is Even.
III. Some Whole are Composite.
IV. All Odd are not Prime.
A) Only I, II and III follow
B) Only I, II and IV follow
C) All follow
D) Only I and IV follow

17. Statements: All rivers are water. Some water is pond. No pond is tree. All trees are jungle.
Conclusion:
I. Some rivers are pond.
II. Some water is not tree.
III. All rivers being jungle is a possibility.
A. Only I.
B. Only III.
C. II and III.
D. I and II.

18. Statements: Some triangles are square. All squares are cube. No cube is circle.
Some circles are rectangle.
Conclusion: I. All triangles being circle is a possibility.
II. No square is circle.
III. Some triangle is cube.
A. Only II.
B. Only III.
C. I and III.
D. II and III.

19. Statements: All pens are pencil. All pencils are eraser.
Some erasers are colour. Some colours are brush.
Conclusion:
I. All erasers are pen.
II. Some brush is pencil.
III. Some erasers are not colour.
A. I and III.
B. Only III.
C. II and III.
D. None follows

20. Statements: Some Hen are Peacock. Some Peacock are Crow. No Crow is parrot.

Conclusions:
I. All Hen being parrot is a possibility.
II. At least some peacock is parrot.
A. Neither I nor II follow.
B. I and II follow.
C. Only I follow.
D. Either I or II follow.

21. Statements: No A is C. All B is C. No B is D.
Conclusions:
I. Some C is definitely not D.
II. All B is not A.
A. Neither I nor II follow.
B. I and II follow.
C. Only I follow.
D. Either I or II follow.

22. Statements: Some Shirts are Skirts. Some Skirts are Buttons. All Trousers are Buttons.
Conclusions:
I. Some Skirt are Trousers.
II. All Trousers being Shirt is a possibility.
A. Neither I nor II follow.
B. I and II follow.
C. Only I follow.
D. Only II follow

23. Statements: All Wallet is Pocket. All Money is Pocket. Some Pocket is Rupees. No Rupees is Note.
Conclusions:
I. Some Rupees is Wallet.
II. Some Pocket is not Note.
III. All Wallet being Note is a possibility.
IV. Some Money is Rupees.
A. If only conclusion II follows.
B. If conclusion II and conclusion III follows.
C. None conclusion follows.
D. If Either conclusion I or conclusion III follows.

Competitive Level Problems

1. Statements:
All Laptop is Camera. Some Camera is Speaker. All Music is Speaker. Some Speaker is Photo.
Conclusions:
I. All Laptop being Photo is a possibility.
II. Some Speaker is Photo.
III. All Camera is Music.
IV. No Laptop is Photo.
A. If only conclusion III follows.
B. If only conclusion I and conclusion III follows.
C. If conclusion follows.
D. If conclusion I and conclusion II follows.

2. Statements: All Song is Lyrics. No Lyrics is Machine.
All TV is Tablet. All Tablet is Machine.
Conclusions:
I. No Song is TV.
II. Some Machine is Tablet.
III. No Tablet is Lyrics.
IV. Some TV is Machine.

A. If only conclusion II follows.
B. If conclusion II and conclusion III follows.
C. None conclusion follows.
D. All conclusion follows.

3. Statements: Some Dog is Cat. All Jocker is Cat. No Jocker is Donkey. Some Donkey is Horse.
Conclusions:
I. Some Cat is Donkey.
II. All Dog is Horse.
III. All Jocker being Horse is a possibility.
IV. No Dog is Horse.
A. If only conclusion II and conclusion III follows.
B. If only conclusion I, conclusion II and conclusion III follows.
C. If none conclusion follows.
D. If Either conclusion II or conclusion IV follow.

4. Statements: No Ink is Key All Key is Lock. Some Lock is Iron. All Oil is Iron.
Conclusions:
I. All Ink being Lock is a possibility.
II. Some Oil is Key.
III. Some Iron is Key.
IV. All Key being oil is a possibility.
A. If All conclusion follows.
B. If only conclusion II and III follow.
C. If conclusion I and conclusion IV follows.
D. If conclusion II and conclusion III follows.

Direction (Q.5-10): In each of the questions below, three statements are given followed by two conclusions numbered (I) and (II) are given. You have to consider the statements to be true even if they seem to be at variance with commonly known facts. You have to decide which of the following conclusions logically follows from the given statements. Give answer.
(A) If only conclusion I follows.
(B) If only conclusion II follows.
(C) If either conclusion I or conclusion II follows.
(D) If neither conclusion I nor conclusion II follows.
(E) If both conclusion I and II follow.

5. Statements:
All gold is silver. No silver is stone. All metal is silver.
Conclusion:
I. Some stones being metal is a possibility.
II. Some silver is gold.

6. Statements:
No pearl is paper. Some diamond is water. All diamond is paper
Conclusion:
I. No diamond is pearl
II. Some pearl being water is a possibility

7. Statements: Some circle is square. Some cone is square. No square is cube
Conclusion:
I. Not every circle is cube
II. Some cones are not cube

8. Statements: All tables is chair. All balloons is biscuit. Some chair is balloon
Conclusion:
(I) A few chair is biscuit

(II) All tables is biscuit

9. Statements: No ring is money. All pocket is money. No pocket is door
Conclusion:
I. Some ring is door
II. No ring is door

10. Statements: Some cloud is bird. No bird is car. All car is banana
Conclusion:
I. Some banana are not bird.
II. All cloud being banana is a possibility

NUMBER RANKING TEST

In this type of questions, a set of information pertaining to persons, objects, or some other entities alongwith their qualities, which can be compared, is provided.

Type 1

Total number of people = total number of people before or after the given person in a row + position of that same person from the different side.

Ex: In a row of people, the position of person X from the left-hand side is 23rd and there are 5 people after X in a row. So, how many total people are there in the row?

Here, the total number of people in the row = number of people after X + position of X from the left side.

Thus, total number of people = 23 + 5 = 28

Type 2

Total number of people = (sum of positions of similar person from both sides i.e. right and left side) – 1

Ex: Ina row of people, the position of X on the left-hand side of the row is 25th while the position of X from the right-hand side of the row is 32nd. How many total numbers of people are there in the row?

Total number of students = (Position of X from light + position of X from left) – 1

= (25 + 32) – 1

= 56

Type 3

When the position of two people are given from either end and we know the total number of people than two cases are formed when trying to determine the total number of people between these positions.

1. When there is no overlapping, the sum of the positions of the two people from either end < total number of people

2. If there is overlapping, the sum of the positions of the two people from either end > total number of people

So, the number of candidates between two different people = total number of students – the sum of positions of two different people from either end

Ex: There are 52 people in a row. X is at the 13th position from the left side of the row while Y is at 18th position form right side of the row. Find the total number of people between X and Y.

So, sum of positions between X and Y either ends = 13 + 18 = 31 < total number of people

Thus, no. of people between X and Y = total no of candidates – (position of X from a left + position of Y from right)

=> 52 – (13 + 18) = 21

Class Practice Problems

1. Which of the following is the sixth to the left of the twentieth from the left end of the below arrangement?

B M % R 3 J @ K © D F 6 9 W 4 * N E P 2 $ A Y 5 I Q Z # 7 U G

A. J B. Q C. W D. E

2. Which is the third number to the left of the number which is exactly in the middle of the following sequence of numbers?

1 2 3 4 5 6 7 8 9 2 4 6 8 9 7 5 3 1 9 8 7 6 5 4 3 2 1

A.3 B.4 C.5 D.6

3. Which of the following is the sixth to the right of the twentieth from the left end of the below arrangement?

B M % R 3 J @ K © D F 6 9 W 4 * N E P 2 $ A Y 5 I Q Z # 7 U G

A. J B. Q C. W D. E

4. How many such consonants are there in the above arrangement, each of which is immediately preceded by a symbol and immediately followed by a number?

A. None B. One C. Two D. Three

5. What should come in the place of question mark (?) in the following series based on above arrangement?

MRJ ©F9 *E2 ?

A. Y5l B. YIQ C. A5Q D. YIZ

R 4 3 % M @ K E F 5 A # J N I 8 U © D B P 6 I W 7 ϱ Q * Z

6. If all the symbols are dropped from the sbove arrangement, which of the following will be fourth to the left of ninth from the left end?

A. K B. E C. M D. 3

7. If all the numbers are dropped from the above arrangement, which of the following will be seventh to the right of eighteenth from the right end?

A. J B. # C. U D. N

8. How many such numbers are there in the above arrangement, each of which is immediately followed by a letter but not immediately preceded by a symbol?

A. None B. One C. Two D. Three

Ques 832 719 654 967 481

9. If the positions of the second and the third digits within each number are interchanged, which of the following will be the sum of the first and the second digits of the third highest number?

A. 16 B. 10 C. 9 D. 15

10. Which of the following is the sum of the first and the third digits of the second lowest number?

A. 16 B. 10 C. 18 D. 5

11. If the positions of the first and the second digits within each number are interchanged, which of the following will be the difference between the highest and the second highest number?

A. 203 B. 133 C. 385 D. 144

12. If the positions of the first and the third digits within each number are interchanged, which of the following will be the sum of the second and third digits of the lowest number?

A. 8 B. 11 C. 15 D. 12

13. If the order of the digits in each of the following numbers is reversed and then newly formed numbers are arranged in ascending order, what will be the middle digit of the fourth number from the top? 845, 632, 489, 398, 817, 546, 279, 638

A.1 B. 3 C. 4 D. 8

235 762 198 438 623 911

14. If the position of the first and second digits are interchanged then what is the difference between the highest and second lowest number?

A. 555 B. 655 C. 455 D. 755

15. If all the digit in the numbers are written in reverse order then which number is the third largest number?

A. 762 B. 135 C. 235 D. 623

16. If the digits of all numbers are added then which number is the largest among them?

A. 235 B. 762 C. 198 D. 911

17. If 100 is subtracted from all the numbers and then the number obtained are written in reverse order, then the lowest number is

A. 235 B. 198 C. 911 D. 623

18 . In a group of six children, Q is taller than P but not as tall as L. M is taller than N and 0, but not as tall as P. Who is the shortest among them?

A. N B. 0 C. P D. Data inadequate

19. Nitin ranks eighteenth in a class of 49 students. What is his rank form the last?

A. 18 B. 19) C. 31 D. 32

20. 12. A class of boys stands in a single line. A boy is nineteenth in order from both the ends. How many boys are there in the class?

A. 27 B. 37 C. 39 D. None of these

21. Manoj and Sachin are ranked seventh and eleventh respectively from the top in a class of 31 students. What will be their respective ranks from the bottom in the class?

A. 20 and 24 B. 24` and 20 C. 25 and 21 D. 26 and 22

22. In a row of boys, Mohan is twentieth from the left and twelfth from the right end. Pratap is fifteenth from the right end in that row. How many boys are there between Mohan and Pratap?

A. 4 B. 2 C. 3 D. None of these

23. Some boys are sitting in a row. P is sitting fourteenth from the left and Q is seventh from the right. If there are four boys between P and Q, how many boys are there in the row ?

A.25 B. 23 C. 21 D. 19

24. In a.row of girls, there are 16 girls between Priya and Natasha. Priya is thirty-second from the left end of the row. If Priya is nearer than Natasha from the right end of the row, then how far away is Natasha from the left end of the row?

A. Data inadequate B. 14^{th} C. 15 D.16 th

25. In a queue, Shikhar is ninth from the back. AruŶ's place is eighth frow̃ the froŶt. Nikhil is standing between the two. What be the minimum number of boys standing in the queue.?

A. 8 B) 10 C. 12 D. 14

Tutorial Practice Problems

1. Which of the following is exactly in the midway between the ninth from left end and the seventh from the right end?

E G 4 B H 7 5 @ K 8 D N £ Q Z $ W 3 C 1 9 * L B 2 S 6

A. Z B. B C. $ D. W

2. 11. Sam ranked ninth from the top and thirtyeighth from the bottom in a class. How many students are there in the class?

A.45 B. 46 C. 47 D.48

3. Mohan is thirteenth from the left end in a row of children. Prabir is twelfth from the right and eighteenth from the left end. How many children are towards the right of Mohan in that row?

A. 12 B. 16 C. 17 D. Can't' be determined

4. In a row of children A is 13th from the left and D is 17th from the right. If in this row A is 11th from the right, then what. is the position of D from left?

A. 12^{th} B. 6^{th} C. 7^{th} D. 10^{th}

Arrangement:- B M % R 3 J @ K © D F 6 9 W 4 * N E P 2 $ A Y 5 I Q Z # 7 U G

5. If all the symbols and all the vowels are dropped from the above arrangement, which of the following will be twelfth from the right end?

A.9 B.6 C. P D. Y

6. How many such numbers are there in the above arrangement, each of which is immediately preceded by a letter but not immediately followed by a letter?

A. None B. One C. Two D. Three

Arrangement:- R 4 3 % M @ K E F 5 A # J N I 8 U © D B P 6 I W 7 ϱ Q * Z

7. How many such consonants are there in the above arrangement, each of which is immediately preceded by a symbol and immediately followed by a letter?

A. None B. One C. Two D. Three

8. Four of the following five are alike in a certain way based on their positions in the above arrangement and so form a group. Which is the one that does not belong to that group?

A. JAl B. 3R% C. 8©l D. #NA

9. Which is the third number to the left of the number which is exactly in the middle of the following sequence of numbers? 1 2 3 4 5 6 7 8 9 2 4 6 8 9 7 5 3 1 9 8 7 6 5 4 3 2 1

A.3 B.4 C.5 D.6

10. Which of the following is exactly in the midway between the ninth from left end and the seventh from the right end? E G 4 B H 7 5 @ K 8 D N £ Q Z $ W 3 C 1 9 * L B 2 S 6

A.Z B. B C. $ D.W

11. Which of the following is neither immediately preceded by a letter nor immediately followed by a letter? M K 3 $ R E 5 F % T U J * 8 P H B N 2 I S # A 3 7 D 4

A.None B. B C. $ D. 7

12 . How many such numbers are there in the series which are immediately followed by its multiple? 6 7 5 4 3 7 4 8 9 3 2 5 4 7 9 8 6 8 7 1 2 5 3 7 6 8 9 3 6

A.4 B. 3 C. 2 D. 1

13 . If letter of above given series are written in reverse order then which letter will be third to the left of eighteenth letter from your right? N O P Q Y B Z A R S H I J K L M T U V G F E W X D C

A.Z B.F C.I D.L

14. If the order of the digits in each of the following numbers is reversed and then newly formed numbers are arranged in ascending order, what will be the middle digit of the fourth number from the top? 845, 632, 489, 398, 817, 546, 279, 638

A.1 B. 3 C. 4 D. 8

15. A class of boys stands in a single line. One boy is nineteenth in order from both the ends. How many boys are there in the class?

A.27 B. 37 C. 38 D. 39

16. In a queue of 20 boys, D is fourteenth from the top and F is ninth from the bottom, how many boy are there between and F?

A. 2 B. 3 C. 4 D. Data inadequate

17. In a row of students, Ramesh is 12th from the left and Kashi is 17th from the right. When Ramesh and Kashi interchange their positions Kashi becomes 27th from the right. How many students are there between Kashi and Ramesh?

A. 9 B. 12 C. 7 D. I 0

18. In a row of students, Ramesh is 12th from the left and Kashi is 17th from the right. When Ramesh and Kashi interchange their positions Kashi becomes 27th from the right. How many students are there between Kashi and Ramesh?

A. 9 B. 12 C. 7 D. I0

19. In a row of boys, A is fifteenth from the left and B is fourth from the right. There are three boys between A and B. C is just left of A. What is C's position from the right?

A. 9th B. 10th C. 12th D. None of these.

20. 7. In a row of forty students R is fifth from the right end and there are ten between R and D. What is D’s position from the left end of the row?

A. 26th B. 23rd C. 25th D. Data inadequate

21. 19 . Richard is fifteenth from the front in a column of boys. There were thrice as many boys behind him as there were in front. How many boys are there between Richard and the seventh boy from the end of the column?

A. 33 B. 34 C. 35 D. Data inadequate

22. Forty boys are standing ow facing the North. Amit is eleventh from the left and Deepak is thirty-first from the right end of the row. How far will Shreya who is third to the right of Amin the row, be from Deepak?

A. 2nd B. 3rd C. 4th D. 5th

23. Among A, B, C, D and E each having scored different marks, B has scored more marks than E and D, B has not scored the highest marks among them. Who among them scored second highest marks?

A. B B. C C. E D. Data inadequate

24. In a class, among the passed students, Amisha is twenty-second from the top and Sajal who is 5 ranks below Amisha, is thirty-fourth from the bottom. All the students from the class have appeared for the exam. If the ratio of the Number Ranking Test 57 Department of Analytical Skills, School of Professional Enhancement students who passed in the exam to those who failed is 4:1 in that class, how many students are there in the class?

A. 60 B. 75 C. 90 D. Data inadequate.

25. Pankaj is younger than Sunita and Rupali is older than Tom. Who among them is the oldest?

I. Rupali is older than Pankaj. II. Sunita is older than Rupali. III. Tom is the youngest among all.

A. Only II B. Only III C. I and II together D. I, II and III all together (e) None of these

Competitive Level Problems

1. If all the numbers are dropped from the series and the order of letters is reversed, which letter will be 6th to the right to fifth letter from left?

F 6 Z 7 1 T 3 U X R 5 2 9 P 4 B A 7 8 D 4 6 F G H 2 P 3 Q R

A.F B. X C. R D. G

2. below:- 235 762 198 438 623 911 .If 100 is subtracted from all the numbers and then the number obtained are written in reverse order, then the second lowest number is

A. 235 B. 198 C. 762 D. 623

3. Count each 7 which is not immediately preceded by 5 but is immediately followed by either 2 or 3. How many such 7's are there ? 5 7 2 6 5 7 3 8 3 7 3 2 5 7 2 7 3 4 8 2 6 7 8

A.2 B.3 C. 4 D. 5

4. In the following sequence, if the positions of the letters in the sequence remain unchanged and the positions of the numbers in the sequence are reversed then which of the following letter/number is fifth to right of ninth letter/number from the right? Q D T P 5 2 3 F G 5 4 B 7 H J 9 K 6 M N 8

A.P B. 6 C. 3 D. None of these

5. In a row of girls facing North, Reena is 10th, to the left of Pallavi who is 21 st from the right end. If Malini who is 17 th from the left end, is fourth to the right of Reena . How many girls are there in the row.?

A. 37 B. 43 C. 44 D. Data inadequate

Direction:- (6-7) Amongst five friends, each got a different percentage of marks in the examination. Poonam scored more than Ben but less than Ajay. Ajay scored 70% marks. Shreya scored less marks only than Kim. The one who scored the minimum marks scored 65% marks and the one who scored the highest, scored 87% marks.

6. Who amongst the following scored the second lowest marks?

A. Ben B. Kim C. Shreya D. Poonam

7. Who amongst the following is the most likely to have scored 82% marks?

A. Ben B. Poonam C. Shreya D. Kim

8-10. There are five men, Anuj, Kunal, Sourav, Rahul and Harish. The one who is tallest is not the youngest. Kunal is older than only Harish. Sourav is older than Rahul but shorter than him. Only one person is taller than Rahul. Anuj is shortest while younger than only Sourav and Rahul. Only two men are shorter than Sourav.

8. Which of following men is third tallest of the five?

A. Sourav B. Rahul C. Harish D. Kunal

9. Who among the following men is tallest?

A. Sourav B. Rahul C. Kunal D. Harish

10 . If the five men are made to stand in a line according to the height, first in ascending order, then in descending order, then whose position will remain the same in both the arrangements?

A. Harish B. Rahul C. Kuna D. Sourav

MENSURATION

Mensuration is defined as the study of the measurement of various 2D and 3D geometric shapes involving their surface areas, volumes, etc.

Difference between mensuration and geometry

Mensuration refers to the calculation of various parameters of shapes like the perimeter, area, volume, etc. whereas; geometry deals with the study of properties and relations of points and lines of various shapes.

2D mensuration deals with the calculation of various parameters like the area and perimeter of 2-dimensional shapes like squares, rectangles, circles, triangles, etc.

3D mensuration is concerned with the study and calculation of surface area, lateral surface area, and volume of 3-dimensional figures like a cube, sphere, cuboid, cone, cylinder, etc.

Important Formulas

Formula for 2D Mensuration

1) Rectangle

Perimeter of a Rectangle = 2(Length + Breadth)

Area of a Rectangle = Length × Breadth

2) Square

Area of a Square= $Side^2$

Perimeter of a Square= 4(Side)

3) Circle

Diameter of a Circle = 2 × Radius

Circumference of a Circle = $\pi \times$ Diameter or $2 \times \pi \times$ Radius

Area of a Circle = $\pi \times Radius^2$

4) Triangle

Area of a Triangle = ½ × b × h

5) Parallelogram

Perimeter of a Parallelogram = 2 (a+b)

Area of a Parallelogram = b × h

Formula for 3D Mensuration

1) Cube

Volume of a Cube = $Side^3$ cubic units.

Lateral Surface Area of a Cube= $4 \times side^2$ sq.units.

Total Surface Area of a Cube= $6\times side^2$ sq. units.

2) Cuboid

Volume of a Cuboid = (length * width * height) cubic units.

Lateral Surface Area of a Cuboid = 2×height (length + width) sq. units.

Total Surface Area of a Cuboid = 2(length × width + length × height + height × width) sq. Units.

Diagonal length of a Cuboid = Square root ($length^2 + breadth^2 + height^2$) units.

3) Cone

Volume of a Cone = $1/3 \times \pi \times radius^2 \times height$ cubic units.

Total Surface Area of the Cone = πr (slant height + radius)

4) Sphere

Volume of a Sphere = $4/3 \times \pi \times radius^3$ cubic units.

Surface Area of a Sphere = $4 \times \pi \times radius^2$ sq. units.

4) Hemi-Sphere

Volume of a Hemi-Sphere = $2/3 \times \pi \times radius^3$ cubic units.

Surface Area of a Hemi-Sphere = $3 \times \pi \times radius^2$ sq. units.

Height And Distance

To calculate the angle of elevation or depression we can use the following formula:

Sinθ=Perpendicular/Hypotenuse.

Cosθ=Base/Hypotenuse

Tanθ=Perpendicular/Base

Here, θ is either the angle of elevation or depression.

Terms Related to Height and Distance

1) Line of Sight: It is the straight line that is drawn from the eye of an observer to the point of an object which is to be viewed.

2) Horizontal Level: It is the horizontal line drawn from the eye of the viewer.

3) The angle of elevation: It is the angle formed between the line of sight and horizontal level if the object is above the horizontal level.

4) The Angle of Depression: It is the angle formed between the line of sight and the horizontal level if the object is below the horizontal level.

5) Pythagorean Theorem

Since height and distance involve a right-angled triangle so Pythagoras theorem can be used to find the length of the sides. Pythagoras theorem states that the square of the hypotenuse of a right-angled triangle is equal to the sum of the square of its base and height.

$(\text{Hypotenuse})^2=(\text{Base})^2 + (\text{Perpendicular})^2$

If the length of the base, perpendicular and hypotenuse of a right-angle triangle is a, b and c respectively.

Then, $a^2+ b^2= c^2$.

Thus, if the length of any two sides is known then the length of the third side can be found by using the Pythagoras theorem which is also called the Pythagorean triple.

Class Practice Problems

1. The perimeter of a square is equal to twice the perimeter of a rectangle of length of 8 cm and breadth 7 cm. What is the circumference of a semicircle whose diameter is equal to the side of the square?
A. 38.57 cm B. 23.57 cm C. 42.46 cm D. 47.47 cm

2. A path of uniform width surrounds a circular park. The difference of internal and external circumferences of this circular path is 132 m. Its width is (take $\pi=22/7$)
A. 22 m B. 20 m C. 21 m D. 24 m

3. Find the ratio of the diameter of the circles inscribed in an equilateral triangle, the diameter circumscribing that equilateral triangle and the height of the same equilateral triangle?
A. 1 : 2 : 1 B. 2 : 4 : 3 C. 1 : 3 : 4 D. 3 : 2 : 1

4. Find the area of a right-angled triangle if the radius of its circumcircle is 5 cm and the altitude drawn to the hypotenuse is 4 cm.
A. 20 cm^2 B. 22 cm^2 C.$20\sqrt{2}$ cm^2 D. $22\sqrt{2}$ cm^2

5. Find the area of a circle whose circumference is 44 cm.
A. 154 cm^2 B.150 cm^2 C.145 cm^2 D. 140 cm^2

6. The inner circumference of a circular field is 704 m. A road 7 m wide is constructed on the outside. Find the area of the path.
A. 5082 m^2 B. 5060 m^2 C. 5060.5 m^2 D. 5000 m^2

7. A square park has each side of 100 m. At each corner of the park, there is a flower bed in the form of a quadrant of radius 14 m. Find the area of the remaining part of the park.
A. 9184 m^2 B.9284 m^2 C. 9834 m^2 D. 9384 m^2

8. An equilateral triangle of side 6 cm has its corners cut off to form a regular hexagon. Area (in cm2) of this regular hexagon will be
A.$3\sqrt{3}$ B. $3\sqrt{6}$ C. $6\sqrt{3}$ D. $(5\sqrt{3})/2$

9. Two circles of unit radii, are so drawn that the centre of each lies on the circumference of the other. The area of the region, common to both the circles, is:
A. $((4\pi-3\sqrt{3}))/12$ B. $((4\pi-6\sqrt{3}))/12$ C. $((4\pi-3\sqrt{3}))/6$ D. $((4\pi-6\sqrt{3}))/6$

10. The diameter of the base of a cylindrical drum is 35 dm and its height is 24 dm. It is full of kerosene. How many tins, each of size 25 cm × 22 cm × 35 cm can be filled with kerosene from the drum?
A. 1000 B. 1200 C. 1400 D. 1800

11. A wooden box measures 20 cm × 12 cm × 10 cm. the thickness of the wood is 1 cm. The volume of the wood required to make the box is:
A. 960 cm cube B. 900cm cube C. 1000cm cube D. 1100 cm cube

12. If the areas of the three adjacent faces of a cuboidal box are 120 cm square, 72 cm square and 60 cm square respectively, then the volume of the box is:
A. 800 cm cube B. 680 cm cube C. 700 cm cube D. 720 cm cube

13. The size of a wooden block is (15 cm × 12 cm × 20 cm). How many such blocks will be required to construct a solid wooden cube of minimum size?
A. 50 B. 40 C. 60 D. 55

14. The ratio of the radius and height of a cone is 5: 12. Its volume is 2200/7 cm. Its slant height is:
A. 15cm B. 12.5cm C. 14cm D. 13 cm

15. Each dimension in metres of a rectangular solid is an integer less than 17, the volume of the solid is 3120 cubic metre. If the height of the solid is 16m and length of the solid is 15 metre, what is the surface area (in sq. metre) of the solid?
A. 1826 B. 1268 C. 1395 D. 1286

16. A rectangular block of metal has dimensions 21 cm, 77 cm and 24 cm. The block has been melted into a sphere. The radius of the sphere is.
A. 21 cm B. 7 cm C. 14 cm D.28 cm

17. The radius of cross-section of a solid cylindrical rod of iron is 50 cm. The cylinder is melted down and formed into 6 solid spherical balls of the same radius as that of the cylinder. The length of the rod (in metres) is
A.0.8 B. 2 C. 3 D. 4

18. Two right circular cones of equal height of radii of base 3 cm and 4 cm are melted together and made to a solid sphere of radius 5 cm. the height of a cone is
A. 10 cm B.20 cm C. 30 cm D. 40 cm

19. The radius of the base and the height of a right circular cone are doubled. The volume of the cone will be
A. 8 times of the previous volume B. 3 times of the previous volume
C. $3\sqrt{2}$ times of the previous volume D. 6 times of the previous volume

20. If h, c, v are respectively the height, curved surface area and volume of a right circular cone then the value of $3\pi vh^3 - c^2h^2 + 9v^2$ is
A. 2 B. –1 C. 1 D. 0

Tutorial Practice Problems

1. A person observed that he required 30 s time to cross a circular ground along its diameter than to cover it once along the boundary. If his speed was 30 m/min, then the radius of the circular ground is (take $\pi=22/7$).
A. 10.5 m B. 3.5 m C. 5.5 m D. 7.5 m

2. The area of a triangle is 216 cm2 and its sides are in the ratio 3 : 4 : 5. The perimeter of the triangle is
A. 6 cm B. 12 cm C. 36 cm D. 72 cm

3. The radius of a circular field is equal to the side of a square field. If the difference between the perimeter of the circular field and that of the square field is 32m, what is the perimeter of the square field?
A. 84 m B. 95 m C. 56 m D. 28 m

4. A wire, when bent in the form of a square, encloses a region having area 121 cm2. If the same wire is bent into the form of a circle, then the area of the circle is?
A. 144 cm^2 B. 180 cm^2 C. 154 cm^2 D. 176 cm^2

5. ABC is an equilateral triangle of side 2 cm. With A, B, C as centers and radius 1 cm three arcs are drawn. The area of the region within the triangle bounded by the three arcs is?
A. $3(\sqrt{3}-\pi/2)cm^2$ B. $(\sqrt{3}-3\pi/2)cm^2$ C. $(\pi/2)cm^2$ D. $(\pi/2-\sqrt{3})cm^2$

6. Two equal maximum sized circular plates are cut-off from a circular paper-sheet of circumference 352 cm. The circumference of each circular plate is.
A. 176 cm B. 180 cm C. 165 cm D. 150 cm

7. Four circles having equal radii are drawn with centres at the four corners of a square. Each circle touches the other two adjacent circle. If remaining area of the square is 168 cm square, what is the size of the radius of the circle?

A.1.4 cm B. 14 cm C.35 cm D.21 cm

8. The water in a rectangular reservoir having a base 80 m by 60 m is 6.5 m deep. In what time can the water be emptied by a pipe of which the cross-section is a square of side 20 cm, if the water runs through the pipe at the rate of 15 km per hour?
A. 40 hrs. B. 58hrs. C. 54hrs. D. 52 hrs.

9. A cistern of capacity 8000 litres measures externally 3.3 m by 2.6 m by 1.1 m and its walls are 5 cm thick. The thickness of the bottom is:
A. 22dm B. 1 dm C. 42 dm D. 2dm

10. A right-angle triangle having base 6.3 m and height equal to 10 m is turned around the height. Find the volume of the cone thus formed.
A. 410 m cube B. 415.8 m cube C. 512.6m cube D. 504m cube

11. The capacity of a cylindrical vessel is 25.872 litres. If the height of the cylinder is three times the radius of its base, what is the area of the base?
A. 616cm square B. 612cm square C. 600cm square D. 588cm square

12. A tank is 7 m long and 4 m wide. At what speed should water run through a pipe 5 cm broad and 4 cm deep so that in 6 hours and 18 minutes, the water level in the tank rises by 4.5 m?
A. 12 kmph B. 10 kmph C. 14 kmph D. 18 kmph

13. The surface area of cube is 864 cm square. Find its volume.
A. 1728 cm cube B. 1628 cm cube C. 1748 cm cube D. 1720 cm cube

14. Two solid cylinders of radii 4 cm and 5 cm and lengths 6 cm and 4 cm, respectively are recast into cylindrical disc of thickness 1 cm. The radius of the disc is
A. 7 cm B. 14 cm C. 21 cm D. 28 cm

15. The outer circumference of a 1 cm thick pipe is 44 cm. How much water will 7 cm of the pipe hold?
A. 1078 cm cube B. 1792 cm cube C. 303 cm cube D. 792 cm cube

16. The areas of three consecutive faces of a cuboid are 12 cm square, 20cm square and 15 cm square, then the volume (in cm square) of the cuboid is
A. 3600 B. 100 C. 80 D. 60

17. If a metallic cone of radius 30 cm and height 45 cm is melted and recast into metallic spheres of radius 5 cm, find the number of spheres.
A. 81 B. 41 C. 80 D. 40

18. A metallic sphere of radius 10.5 cm is melted and then recast into small cones each of radius 3.5 cm and height 3 cm. The number of cones thus formed is
A. 140 B. 132 C. 112 D.126

19. A right circular cone is 3.6 cm height and radius of its base is 1.6 cm. It is melted and recast into a right circular cone with radius of its base as 1.2 cm. Then the height of the cone (in cm) is
A. 3.6 cm B. 4.8 cm C. 6.4 cm D. 7.2 cm

20. If surface area and volume of sphere are S and V respectively, then value of S^3/V^2 is
A. 36 π units B.9 π units C. 18 π units D. 27 π units

Competitive Level Problems

1. Two goats are tethered to diagonally opposite vertices of a field formed by joining the mid-points of the adjacent sides of another square field of side $20\sqrt{2}$m. What is the total grazing area of the two goats if the length of the rope by which the goats are tethered is $10\sqrt{2}$ m?
A. 100π m² B. $50(\sqrt{2}-1)\pi$ m² C. $100\pi(3-2\sqrt{2})$ m² D. $200\pi(2-\sqrt{2})$ m²

2. The radius of the base and the height of a right circular cylinder are 3.5 cm and 7.5 cm respectively. The ratio of the total surface area to the curved surface area of the cylinder will be
A. 22 : 5 B. 22 : 15 C.22 : 7 D. 22 : 17

3. From a solid sphere of radius 15 cm, a right circular cylindrical hole of radius 9 cm whose axis passing through the centre is removed. The total surface area of the remaining solid is:
A. 1188π cm² B. 108π cm² C. 1170π cm² D. 144π cm²

4. A conical circus tent is to be made of canvas. The height of the tent is 35 m and the radius of the base is 84 m. If $\pi = 22/7$, then the canvas required is:
A. 24000 m² B. 24004 m² C. 24014 m² D.24024 m²

5. Water flows at the rate of 10 m per minute from a cylindrical pipe 5 mm in diameter. A conical vessel whose diameter is 40 cm and depth 24 cm is filled. The time taken to fill the conical vessel is:
A. 50 min B. 50 min. 12 sec C. 51 min. 12 sec D. 51 min. 15 sec

6. A cone, a hemisphere and a cylinder stand on equal bases of radius R and have equal heights H. Their whole surfaces are in the ratio:
A. $(\sqrt{3}+1) : 3 : 4$ B. $(\sqrt{2}+1) : 7 : 8$ C. $(\sqrt{2}+1) : 3 : 4$ D. None of these

7. A cylinder is circumscribed about a hemisphere and a cone is inscribed in the cylinder so as to have its vertex at the centre of one end and the other end as its base. The volumes of the cylinder, hemisphere and the cone are respectively in the ratio of:
A. $3 : \sqrt{3} : 2$ B. 3 : 2 : 1 C. 1 : 2 : 3 D. 2 : 3 : 1

8. A large solid sphere of diameter 15 m is melted and recast into several small spheres of diameter 3 m. What is the percentage increase in the surface area of the smaller spheres over that of the large sphere?
A. 200% B. 400% C. 500% D. can't be determined

9. A hemispherical basin 150 cm in diameter holds water one hundred and twenty times as much a cylindrical tube. If the height of the tube is 15 cm, then the diameter of the tube (in cm) is:
A. 23 B.24 C. 25 D.26

10. The total number of spherical bullets, each of diameter 5 decimeter, that can be made by utilizing the maximum of a rectangular block of lead with 11 metre length, 10 metre breadth and 5 metre width is
A. 8800 B. 8500 C. 8400 D. 90

HEIGHT AND DISTANCE

Height And Distance

To calculate the angle of elevation or depression we can use the following formula:

Sinθ=Perpendicular/Hypotenuse.

Cosθ=Base/Hypotenuse

Tanθ=Perpendicular/Base

Here, θ is either the angle of elevation or depression.

Terms Related to Height and Distance

1) Line of Sight: It is the straight line that is drawn from the eye of an observer to the point of an object which is to be viewed.

2) Horizontal Level: It is the horizontal line drawn from the eye of the viewer.

3) The angle of elevation: It is the angle formed between the line of sight and horizontal level if the object is above the horizontal level.

4) The Angle of Depression: It is the angle formed between the line of sight and the horizontal level if the object is below the horizontal level.

5) Pythagorean Theorem

Since height and distance involve a right-angled triangle so Pythagoras theorem can be used to find the length of the sides. Pythagoras theorem states that the square of the hypotenuse of a right-angled triangle is equal to the sum of the square of its base and height.

$(\text{Hypotenuse})^2=(\text{Base})^2+(\text{Perpendicular})^2$

If the length of the base, perpendicular and hypotenuse of a right-angle triangle is a, b and c respectively.

Then, $a^2+b^2=c^2$.

Thus, if the length of any two sides is known then the length of the third side can be found by using the Pythagoras theorem which is also called the Pythagorean triple.

Class Practice Problems

1. Find the angle of elevation of the sun when the shadow of a pole of 18 m height is $6\sqrt{3}$ m long?
A. 30° B. 60° C. 45° D. None of these

2. The angle of elevation of the sun, when the length of the shadow of a tree is $\sqrt{3}$ times the height of tree, is:
A. 30 degree B. 45 degree C. 60 degree D. 9 degree

3. A ladder 10 m long just reaches the top of a wall and makes an angle of 60° with the wall. Find the distance of the foot of the ladder from the wall ($\sqrt{3}=1.73$).
A. 4.32 m B. 17.3 m C. 5 m D. 8.65 m

4. From a point P on a level ground, the angle of elevation of the top of a tower is 300 If the tower is 100 m high, the distance of point P from the foot of the tower is:
A. 149 m B. 156 m C. 173 m D. 200 m

5. From a point 20 m away from the foot of a tower, the angle of elevation of the top of the tower is 30°. The height of the tower is:
A. $10\sqrt{3}$ m B. $20\sqrt{3}$ m C. $10/\sqrt{3}$ m D. $20/\sqrt{3}$ m

6. An observer 1.6 m tall is $20\sqrt{3}$ away from a tower. The angle of elevation from his eye to the top of the tower is 30°. The height of the tower is:
A. 21.6 m B. 23.2 C. 24.72 m D. None of these

7. A tower is $100\sqrt{3}$ metres high. Find the angle of elevation of its top from a point 100 metres away from its foot.
A. 50^o B. 40^o C. 80^o D. 60^o

8. An observer 2 m tall is $10\sqrt{3}$ m away from a tower. The angle of elevation from his eye to the top of the tower is 30^o. The height of the tower is:
A. 10 m B. 12 m C. 14 m D. 16 m

9. On the same side of a tower, two objects are located. Observed from the top of the tower, their angles of depression are 45° and 60°. If the height of the tower is 600 m, the distance between the objects is approximately equal to :
A. 272 m B. 284 m C. 288 m D. 254 m

10. The angle of elevation of the top of a lighthouse 60 m high, from two points on the ground on its opposite sides are 45° and 60°. What is the distance between these two points?
A. 45 m B. 30 m C. 103.8 m D. 94.6 m

11. The angle of elevation of the top of a tower from a point on the ground is 30° and moving 70 metres towards the tower it becomes 60°. The height of the tower is:
A. 10 metre B. $10/\sqrt{3}$ metre C. $10\sqrt{3}$ metre D. $35\sqrt{3}$ metre

12. A tree breaks and falls to the ground such that its upper part is still partially attached to its stem. At what height did it break, if the original height of the tree was 24 cm and it makes an angle of 30° with the ground?
A. 12 cm B. 8 cm C. 9.5 cm D. 7.5 cm

13. The top of a 15 m. high tower makes an angle of elevation of 60 degree with the bottom of an electric pole and an angle of 30 degree with the top of the pole. What is the height of the pole?
A. 12 m B. 10 m C. 11 m D. 5 m

14. From the top of a temple near a river the angles of depression of both the banks of river are 45° & 30°. If the height of the temple is 100 m then find out the width of the river.
A. $100(\sqrt{3}-1)$m B. $50(\sqrt{3}-1)$m C. $200(\sqrt{3}-1)$m D. $300(\sqrt{3}-1)$m

15. The angle of elevation of an aeroplane from a point on the ground is 60°. After 15 second flight, the elevation changes to 30°, If the aeroplane is flying at a height of $1500\sqrt{3}$ m, find the speed of the plane:
A. 300 m/sec B. 200 m/sec C. 100 m/sec D. 150 m/sec

Tutorial Practice Problems

1. The angle of elevation of a ladder leaning against a wall is 60° and the foot of the ladder is 4.6 m away from the wall. The length of the ladder is:
A. 2.3 m B. 4.6 m C. 7.8 m D. 9.2 m

2. The angle of elevation of the sun, when the length of the shadow of a tree is equal to the height of the tree, is:
A. 30° B. 45° C. 60° D. None of these

3. The angle of elevation of a ladder leaning against a wall is 60^o and the foot of the ladder is 12.4 m away from the wall. The length of the ladder is:
A. 14.8 m B. 6.2 m C. 12.4 m D. 24.8 m

4. From a tower of 80 m high, the angle of depression of a bus is 30°. How far is the bus from the tower?
A. 40 m B. 138.4 m C. 46.24 m D. 160 m

5. The thread of a kite is 120 m long and it is making 30° angular elevation with the ground. What is the height of the kite?
A. 60 m B. 20 m C. 40 m D. 10 m

6. The shadow of a building is 20 m long when the angle of elevation of the sun is 60º. Find the height of the building.
A. 34.64 m B. 38.64 m C. 42.64 m D. 49.64 m

7. A flagstaff 17.5 m high casts a shadow of length 40.25 m. What will be the height of a building, which casts a shadow of length 28.75 m under similar conditions?
A. 14 cm B. 13.5 cm C. 12.5 cm D. 11.4 cm

8. The angle of elevation of the top of a tower from a point A on the ground is 300. On moving a distance of 20 metres towards the foot the tower to a point B, the angle of elevation increases to 600. The height of the tower is:
A. √3 m B. 5√3 m C. 10√3 m D. 20√3 m

9. A vertical post 15 ft. high is broken at a certain height and its upper part, not completely separated meets the ground angle of 300. Find the height at which the post is broken.
A. 10 ft. B. 5 ft. C. 15√3 (2-√3) ft. D. 5√3 ft.

10. A man standing at a point P is watching the top of a tower, which makes an angle of elevation of 30º with the man's eye. The man walks some distance towards the tower to watch its top and the angle of the elevation becomes 60º. What is the distance between the base of the tower and the point P?
A. Data inadequate B. 8 units C. 12 units D. None of these

11. Two ships are sailing in the sea on the two sides of a lighthouse. The angle of elevation of the top of the lighthouse is observed from the ships are 30° and 45° respectively. If the lighthouse is 100 m high, the distance between the two ships is:
A. 173 m B. 200 m C. 273 m D. 300 m

12. From the top of a hill 100 m high, the angles of depression of the top and bottom of a pole are 30° and 60° respectively. What is the height of the pole?
A. 46.67 m B. 56.67 m C. 66.67 m D. None of these

13. The angle of elevation of the top of a tower from the point P and Q at distance of ‘a’ and ‘b’ respectively from the base of the tower and in the same straight line with it are complementary. The height of the tower is:
A. √ab B. a/b C. ab D. a^2 b^2

14. The length of the shadow of a vertical tower on level ground increases by 10 metres when the altitude of the sun changes from 45° to 30°. Then the height of the tower is:
A. 5√3 m B. 10(√3 + 1) m C. 5(√3 + 1) m D. 10√3 m

15. A man standing at a point P is watching the top of a tower, which makes an angle of elevation of 30°. The man walks some distance towards the tower and then his angle of elevation of the top of the tower is 60°. If the height of tower is 30 m, then the distance he moves is:
A. 22 m B. 22√3 m C. 20 m D. 20√3 m

Competitive Level Problems

1. The altitude of the sun at any instant is 60º. Find the height of the vertical pole that will cast a shadow of 30 m.
A. 10√3 m B. 20√3 m C. 30√3 m D. 40√3 m

2. A vertical toy 18 cm long casts a shadow 8 cm long on the ground. At the same time a pole casts a shadow 48 m. long on the ground. Then find the height of the pole?
A. 1080 cm B. 180 m C. 108 m D. 118 cm

3. The angle of elevation of a ladder leaning against a wall is 60º and the foot of the ladder is 12.4 m away from the wall. The length of the ladder is:

A. 20.8 m B. 22.8 m C. 24.8 m D. None of these

4. When the sun's altitude changes from 30° to 60°, the length of the shadow of a tower decreases by 70m. What is the height of the tower?
A. 55.6 m B. 60.6 m C. 65.6 m D. 70.6 m

5. The angle of elevation of the top of a tower from a certain point is 30°. If the observer moves 40 m towards the tower, the angle of elevation of the top of the tower increases by 15°. The height is:
A. 44.6 m B. 54.6 m C. 64.6 m D. 74.6 m

6. If the angle of elevation of the sun changes from 300 to 450, the length of the shadow of a pillar decreases by 20 metres. The height of the pillar is:
A. 20 (√3-1) m B. 20 (√3+1) C. 10 (√3-1) m D. 10 (√3+1)

7. The shadow of the tower becomes 60 metres longer when the altitude of the sun changes from 450 to 300 .Then the height of the tower is:
A. 20(√3+1) m B. 24 (√3+1) C. 30 (√3+1) m. D. 30 (√3-1) m

8. A toy leaves the earth at a point A and rises vertically at uniform speed. After two minutes of vertical rise boy finds the angular elevation of the balloon as 60°. If the point at which boy is standing is 150 m away from point A, what is the speed of the toy?
A. 98 m/s B. 1.08 m/s C. 1.16 m/s D. 2.16 m/s

9. Two pillars of equal height are on either side of a road, which is 120m wide. The angles of elevation of the top of the pillars are 600 and 300 at a point on the road between the pillars. Find the height of the pillars.
A. 10√3 m B. 30√3 m C. 20√3 m D. None of these

10. Two pillars of equal height are on either side of a road, which is 100m wide. The angles of elevation of the top of the pillars are 600 and 300 at a point on the road between the pillars. Find the height of the pillars.
A. 25√3 m B. 30√3 m C. 10√3 m D. None of these

SEATING ARRANGEMENT

Class Practice Problems

linear arrangements:

Q (1 – 5) Six people – C,D,E,F,G, and H are standing in a straight line facing North not necessarily in the same order. D is standing second to the right of F. C is standing fourth to the left of H and H is not standing on the extreme end of the line. E is standing second to the right of D

1.What is position of G with respect to E?
A. Immediate left B. 2nd to the left C. 3rd to the left D. 3rd to the right E) None of these

2.Which of the following pairs represent people standing at the extreme ends?
A. FH B. CE C. DE D. CH E) None of these

3. Who is standing 2nd to the right of C?
A. F B. D C. G D. E E) None of these

4. Four out of five are alike in a certain way based on their positions in the arrangement. One that does not belong to the group is?
A. CG B. GE C. GH D. ED E) None of these

5. If all the people are asked to stand in an alphabetical order from left to right, positions of how many will remain unchanged?
A. one B. Two C. three D. None E) None of these

Q(6 – 10) ABCXYZ are seated in a straight-line facing North. C is third to the right of Z
and B sits second to the right of C. X sits to the immediate right of A.

6. Which of the following represents the pairs of persons sitting exactly in the middle of
the line?
A. XB B. ZB C. BX D. XC E) XY

7. What is X`s position with respect to Z?
A. Immediate right of Z B. Second to the left C. Third to the right D. Second to the right
E) None of these

8. Four out of five are alike bases on their seating positions, find the one which does not belong to the group?
A ZA B. ZB C. XA D. XC E) CY

9. How many persons are seated between A and C?
A. one B.two C.Three D.Four E) None

10. If A:X and Z:A , then Y :
A. Y B. B C. X D. A (E)None of these

(11– 13): Six trees namely Lemon, Ashoka, Banana, Mango, Apple and Papaya are planted in a line. Lemon is third to the left of Papaya tree. Ashoka is at the right end. Banana and Mango trees are immediate neighbours of Lemon. Banana tree is also neighbour of Apple tree.
11. Which of the following trees is at the left end of the row?
(A Mango B. Apple C. Banana D.Papaya (E)Lemon

12. Which among the following trees are not neighbours?

(A Banana and Apple B.Papaya and Ashoka C. Mango and Banana D. Mango and Lemon
(E) Lemon and Banana

13. Which pair of trees represent the trees in the middle of the row?
(A Lemon and Banana B. Banana and Apple C. Ashok and Papaya D. Mango and Apple
(E) Ahoka and Banana

Directions for Q(14 – 18):Read the paragraph carefully and answer the questions below it.
I. Nine family members are sitting in a theatre in one row.
II. They are J, K, L, M, N, O, P, Q and R. L is at the right of M and at third place at the right of N.
III. K is at one end of the row.
IV. Q is immediately next to O and P.
V. O is at the third place at the left of K.
VI. J is right next to the left of O.

14. Which of the following statement is true?
A. There is one person between L and O B. R and P are neighbours
C. M is at one extreme end D. N is at two seats away from J E) None of these

15. The family members sitting on the right of O are
A. RML B.JQP C.QPK D.KPR (E)None of these

16. Who is sitting in the centre of the row?
A. L B. J C. O D. Q E) None of these

17. Who are sitting next to L?
A. A and O B. M and J C. M and O D. P and J E) None of these

18. Who is at the other end of the row?
A. R B. J C. P D.N (E) None of these

(Q19 – 23)Ten people are sitting in two parallel rows containing five people each, in such a way that there is an equal distance between adjacent person. In row 1 P, Q, R , S and T are seated and all of them are facing South. In row 2 A, B C , D and E are seated and all of them are facing North. Therefore, in the given seating arrangement each member seated in a row faces another member of the other row. D sits third to the left of A. P faces immediate neighbor of D. R sits second to the right of P. S sits second to the left of Q. B and E are immediate neighbors and E does not face P.

19. How many persons are seated between
Q and T ?
A. None B. One C. Two D. Three E) None of these

20. Four of the following five are alike in a certain way and, thus, form a group. Which is the one that does not belong to that group ?
A. R B. S C. C D. T E) None of these

21. Who amongst the following represent the people sitting exactly in the middle of the rows ?
A. P , E B. S , D C. S, A D. P, B E) None of these

22. Which of the following is true regarding B ?
A. A and C are immediate neighbors of B B. B sits at one of the extreme ends of the line
C. Q faces B D. D sits to the immediate left of B E) None of these

23. Four of the following five are alike in a certain way and thus, form a group. Which is the one that does not belong to that group ?A

A. T-E B. Q-C C. S-B D. R-A E) None of these

Circular Arrangements:

Directions – (Q. 1– 5) Study the following information to answer the given questions – A, B, C, D, E, F and G are sitting along a circle facing at the centre and are playing cards. E is the neighbour of A and D. There is one person between F and C but G is not between F and C. F is on the immediate right of A.

1. Who are the neighbours of B?

A. C and D B. F and C C. A and F D. Data inadequate E) None of these

2. Which pair given below has the second person sitting immediately to the right of the first?

A. CB B. DG C. EA D. AB E) None of these

3. Which of the following has the person sitting adjacent to each other from left to right in order as given?

A. CDG B. EDG C. BGC D. FBC E) None of these

4. What is the position of F?

A. To the immediate left of A B. To the immediate right of B C. 2nd to the right of C D. 3rd to the left of D (E) None of these

5. Which of the following does not have the pair sitting adjacent to each other?

A. BA B. CB C. DE D. D E) All are sitting adjacent to each other

Directions (Q. 6-11):Study the following information and answer the questions given below:

M, N, P, R, T, W, F and H are sitting around a circle facing the centre. P is third to the left of M and second to the right of T. N is second to the right of P. R is second to the right of W, who is second to the right of M. F is not an immediate neighbour of P.

6. Who is to the immediate right of P?

A. H B. F C. R D. Data inadequate E) None of these

7. Who is to the immediate right of H?

A. R B. F C. M D. Data inadequate E) None of these

8. Who is to the immediate left of R?

A. P B. H C. W D. T E) Data inadequate

9. Who is third to the right of H?

A. T B. W C. R D. F E) Data inadequate

10. Who is second to the right of F?

A. M B. R C.T D. Data inadequate E) None of these

11. In which of the following is the first person sitting in between the second and the third person?

A. NHM B. PHN C.TRP D. TWF E) None of these

Directions (Q. 12-16):Study the following information and answer the questions given below:

A,B,C,D,E,F,G and H are sitting around a circle facing the centre . D is fourth to the right of H and second to the left of B.. F is fourth to the right of B**.** C is fourth to the right of E who is not immediate next to B or D. A is not an immediate neighbour of D.

12 .What is B`s position with respect to G?
A. Third to the right B. Third to the left C. Fifth to the right D. Fourth to the left
E) Fourth to the right

13. In which of the following combinations is the third person sitting in between the first and the second person?
A. ABC B.GCD C. AHE D. CBA E)None of these

14. Who is third to the right of A?
A. H B. E C.F D. A E) None of these

15. Who is to the immediate left of D?
A. G B. C C. F D. H E) None of these

16. Who is fourth to the left of G?
A. E B. F C. A D. H E) None of these

Directions (Q. 17-21):Study the following information and answer the questions given below:
A,B,C,D,E,F,G and H are sitting around a circle facing the centre .H is fourth to the left of B and second to the right of F. A is third to the left of C, who is not an immediate neighbour of F. G is second the left of A. D is second to the right of E

17. Who is on the immediate right of F?
A. H B. A C. G D. Data inadequate E) None of these

18. Who is third to the left of A?
A. C B. F C. B D. Data inadequate E) None of these

19. In which of the following pairs is the first person sitting on the immediate left of the second person?
A. EH B. CE C. AF D. DB E) None of these

20. Which of the following pairs represents the immediate neighbours of E?
A. DH B. HC C. CA D. Data inadequate E) None of these

21. Who is on the immediate right of H?
A. E B. C C. H D. Data inadequate E) None of these

Tutorial Practice Problems

Directions – (Q. 1 – 6) Study the following information to answer the given questions –
Twelve people are sitting in two parallel rows containing six people each, in such a way that there is an equal distance between adjacent person. In row – 1 P, Q, R, S, T and V are seated and all of them are facing South. In row – 2 A, B, C, D, E and F are seated and all of them are facing North. Therefore, in the give seating arrangement each member seated in a row-faces another member of the other row .S sits third to right of Q. Either S or Q sits at an extreme end of the right of E. Two people sit between B and F. Neither B nor F sits at an extreme and of the lien. The immediate neighbour of B faces the person who sits third to left of P. R and T are immediate neighbours of each other. C sits second to the left of A. T does not face the immediate neighbour of D.

1. Who amongst the following sit at extreme ends of the rows ?
A. S, D B. Q, A C. V, C D. P, D E) Q, F

2. Who amongst the following faces S ?
A. A B.B C.C D.D E) F

3. How many person are seated between V and R ?
A. One B. Two C.Three D. Four E) None

4. P is related to A in the same was as is related To B based on the given arrangement.
To which of the following is T related to, following the same pattern ?
A. C B.D C.E D.F (E) Cannot be determined

5. Which of the following is true regarding T ?
A. F faces T B.V is an immediate neighbour of T C. F faces the one who is second to right of T
D. T sits at one of the extreme ends of the line E) Q sits second to the right of T

6. Four of the following five are alike in a certain way based on the given arrangement and so from a group. Which is the one that does not belong to that group ?
A. A-T B. B-T C. F-P D. C-V E)E-Q

(7 – 10). Six chemicals L,M,N,O,P and Q are kept in bottles of different colours viz. green, red , blue, white, pink and violet, not necessarily in this order. These bottle are arranged from left to right. Chemical M is kept in white bottle. Chemical L is not kept in green bottle and is kept to the immediate left of the violet bottle. Chemical O is kept tithe blue bottle and is kept exactly between the bottles containing chemicals L and M. The red bottle is at the extreme left end. The bottle containing chemical Q is not kept at either of the ends. The green bottle is kept at the extreme right end. Chemical P Is not kept near the white bottle.

7. Four of the following are alike in a certain way based on their positions , which is
the one that doesn't belong to this group?
A. LM B. LP C. QO D. LQ E) NO

8. Which bottle contains Chemical L?
A Pink B. Blue C. Red D. White E) None of these

9. Which of the following combinations of
chemical and bottle is correct?
A. P - Red B. N – Green C. P- Green D. Q - Pink E) None of these

10. If all the six chemicals are arranged alphabetically from left to right, positions of
how many will remain unchanged?
A. One B. Two C. Three D. Four E) None

Directions (Q. 11-15):Study the following information and answer the questions given below: A,B,C,D,E,F,G and H are sitting around a circular table. Only E, D and G are facing outside the table, while rest are facing the centre of the table. B is second to the right of A, who is fifth to the right of E. C is third to the left of D, who is sitting second to the right of B. F is second to the left of G.

11. Who is third to the left of G?
A. H B. E C. F D. Data inadequate E) None of these

12. Who is second to the right of H?
A. A B. B C. C D. Data inadequate E) None of these

13. If H and G interchanges their positions, who will be third to the right of D?
A. A B. B C.H D. C E) None of these

14. In which of the following combinations, is the first person sitting between the second and the third persons?
A. CAG B. AGB C.DEF D. EHC E) None of these

15. Who is fourth to the right of F?
A. H B. E C. D D. C E) None of these

Directions (Q16 – 22) : Study the following information carefully and answer the questions given below.
Eight friends , Meenal, Rumia, Shikha, Ali, Peter, Harleen, Ketan and Bharat are sitting around square table in such a way that four of them sit at four corners of the square while four sit in the middle of each of the four sides. The ones who sit at the four corners face the centre while those who sit in the middle of the sides face outside. Bharat sits second to the right of Shikha. Bharat does not sit at any of the corners. Meenal sits third to the right of Peter. Peter is not an immediate neighbour of Shikha. Rumia and Ketan are immediate neighbours of each other but Rumia does not sit at any of the corners of the table. Harleen is neither an immediate neighbour of Peter nor Shikha.

16. Four of the following five are alike in a certain way and so from a group. Which is the one that does not belong to that group ?
A. Peter B. Rumia C. Harleen D. Shikha E) Bharat

17. Who sits third to the left of Ali ?
A. Bharat B. Rumia C. Shikha D. Peter E) Cannot be determined

18. What is the position of Peter with respect to Meenal ?
A. To immediate left B. Second to the left C. Third to the left D. Third to the right
E) Second to the right

19. Who amongst the following sits second to the right of Ketan ?
A. Shikha B. Ali C. Bharat D.Harleen E) Meenal

20. Who amongst the following represent
the immediate neighbours of Harleen ?
A. Meenal, Ketan B. Bharat, Rumia C. Bharat, Meenla D. Ali, Rumia E) Ketan

21. Who amongst the following sits exactly between Peter and Ali ?
A. Only Bharat B. Ketan and Rumia C. Only Harleen D. Harleen and Meenal E) No one

22. Who amongst the following is an immediate neighbour of Meenal ?
A. Rumia B. Ali C. Ketan D. Harleen E) Shikha

(23 – 25) Eight friends A,B,C,D,E,F,G and H are sitting around a circle facing centre. 4 of them drive a car and other 4 ride a bike. No two riding bike sit together. A is 3rd to the left of H and A does not ride a car. G who ride a bike is 2nd to the right of E. F is neighbour of both B and C, and F does not drive a car. C is also a neighbour of H.

23. Who is 3rd to the right of F?
A. B B. A C. D D. H E) None of these

24. Who among the following does not drive a car?

A. A B. B C. E D. C E) All above drive car

25. If all arranged in alphabetical order starting from A in anti-clockwise direction, then positions of how many people will remain unchanged excluding A.

A. One B. Two C. Three D. Four E) None

CALENDAR & CLOCKS

Introduction

Calendar:

Odd Days: We are supposed to find the day of the week on a given date. For this, we use the concept of 'odd days.

In a given period, the number of days more than the complete weeks are called odd days.

Leap Year:

(i) Every year divisible by 4 is a leap year, if it is not a century.

(ii) Every 4th century is a leap year and no other century is a leap year.

Note: A leap year has 366 days.

Examples:

i. Each of the years 1948, 2004, 1676 etc. is a leap year.

ii. Each of the years of 400, 800, 1200, 1600, 2000 etc. is a leap year.

iii. None of the years 2001, 2002, 2003, 2005, 1800, 2100 is a leap year.

Ordinary year: The year which is not a leap year is called an ordinary year. An ordinary year has 365 days.

Counting of odd days:

a. 1 ordinary year = 365 days = (52 weeks + 1 day) 1 ordinary year has 1 odd day

b. 1 leap year = 366 days = (52 weeks + 2 days) 1 leap year has 2 odd days.

c. 100 years = 76 ordinary years + 24 leap years

= (76 x 1 + 24 x 2) odd days = 124 odd days.

= (17 weeks + 5 days)

= 5 odd days.

Number of odd days in 100 years = 5.

Number of odd days in 200 years = (5 x 2) = 3 odd days.

Number of odd days in 300 years = (5 x 3) = 1 odd day.

Number of odd days in 400 years = (5 x 4 +1) = 0 odd day.

Similarly, each one of 800 years, 1200 years, 1600 years, 2000 years etc. has 0 odd days.

Clocks

The face or dial of a watch is a circle whose circumference is divided into 60 equal parts, called minute spaces.

A clock has two hands; the smaller one is called the hour hand or short hand while the larger one is called the minute hand or long hand.

i. In 60 minutes, the minute hand gains 55 minutes on the hour hand.

ii. In every hour, both the hands coincide once.

iii. The hands are in the same straight line when they are coincident or opposite to each other.

iv. When the two hands are at right angles, they are 15-minute spaces apart.

v. When the hands are in opposite directions, they are 30-minute spaces apart.

vi. Angle traced by hour hand in 12 hrs = 360°.

vii. Angle traced by minute hand in 60 min. = 360°.

viii. Too fast and too slow: if a watch or a clock indicates 8.15, when the correct time, 8 is said to be 15 minutes too fast.

On the other hand, if it indicates 7.45, when the correct time is 8, it is said to be 15 minutes too slow.

CALENDAR

1. If 22nd April, 1982 was Thursday, then what day of the week was 3rd November, 1982?
A. Monday B. Wednesday C. Friday D. Sunday

2. If 30th June, 1989 was a Friday, then what day of the week was 17th September, 1993?
A. Monday B. Wednesday C. Friday D. Sunday

3. If 26th February, 2014 is on Wednesday, then what day of the week is on 14th July, 2017?
A. Friday B.Saturday C. Wednesday D. Sunday

4. If 10th April, 1963 was Wednesday, then what day of the week was 23rd August, 1959?
A. Sunday B.Monday C. Friday D. Tuesday

5. If 4th August, 1996 was a Sunday, then what day of the week was 12th April, 1992?
A. Friday B.Saturday C. Monday D. Sunday

6. If 1st January, 2012 is on Sunday, then what day of the week is 1st January, 2016?
A. Friday B.Sunday C. Wednesday D. Saturday

7. If 31st January, 2012 is on Sunday, then what day of the week was 30th July, 1993?
A. Monday B. Sunday C. Friday D. Wednesday

8. It was Sunday on Jan 1, 2006. What was the day of the week Jan 1, 2010?
A. Sunday B. Saturday C. Friday D. Wednesday

9. On 8th Feb, 2005 it was Tuesday. What was the day of the week on 8th Feb, 2004?
A. Tuesday B. Monday C. Sunday D. Wednesday

10. If 20th January, 2000 was a Thursday, then what day of the week was 26th February, 1997?
A. Tuesday B. Sunday C. Wednesday D. Thursday

11. If the first day of the year 2005 is a Saturday, then what day of the week will be 1st January, 2009?
A. Thursday B. Friday C. Sunday D. Monday

12. What day of the week will 1st January, 2018 be, given that 1st January, 2012 is a Saturday?
A. Monday B. Saturday C. Sunday D. Friday

13. On 8th Dec, 2007 Saturday falls. What day of the week was it on 8th Dec, 2006?
A. Sunday B. Thursday C. Tuesday D. Friday

14. What was the day of the week on 28th May, 2006?

A. Thursday B. Friday C. Saturday D. Sunday

15. What was the day of the week on 17th June, 1998?
A. Monday B. Tuesday C. Wednesday D. Thursday

16. What day of the week was 18th July, 1978?
A. Sunday B. Monday C. Tuesday D. Friday

17. What day of the week would be 26th March, 2023?
A. Sunday B. Monday C. Tuesday D. Friday

18. Which will be the next leap year after 2096?
A. 2100 B. 2102 C. 2104 D. 2108

19. What will be the day of the week 15th August, 2010?
A. Sunday B. Monday C. Tuesday D. Friday

20. Which of the following is not a leap year?
A. 700 B. 800 C. 1200 D. 2000

21. On which dates of March, 2008 will a Sunday, come?
A. 2, 9, 16, 23, 30 B. 1, 8, 15, 22, 29 C. 7, 14, 21, 28 D. 3, 10, 17, 24, 31

22. If holiday are declared only on Sundays and 19th March in a particular year was a Sunday, is 23rd September a holiday in that year?
A. Yes, 23rd September is a holiday B. 23rd September is not a holiday
C. 23rd September is a holiday only if it is a leap year D. Cannot be determined

23. Today is Monday. After 61 days, it will be:
A. Wednesday B. Saturday C. Tuesday D. Thursday

24. If today is Sunday, then what day of the week will be the 426th day from today?
A. Saturday B. Friday C. Tuesday D. Wednesday

25. If today is Wednesday, what day will it be, 1 year and 10 days from today?
A. Sunday B. Friday C. Sunday D. Cannot be determined

26. The calendar for the year 2007 will be the same for the year:
A. 2014 B. 2016 C. 2017 D. 2018

27. Which year will have the same Calendar as that of 2002?
A. 2008 B. 2011 C. 2009 D. 2013

28. Which year will have the same calendar as that of 2008?
A. 2014 B. 2024 C. 2032 D. 2036

29. Which among the following years is a leap year?
A. 2600 B. 2700 C. 2800 D. 3000

30. How many days are there in x weeks x days?
A. 7x2 B. 8x C. 14x D. 7

CLOCK

1. How many degrees does an hour-hand move in 10 minutes?
A. 10° B. 20° C. 15° D. 5°

2. How many degrees will the minute-hand move in the same time, in which the hour-hand moves 10°?

A. 40° B. 80° C. 120° D. 160°

3. A boy observes the reflection of a wall clock in a mirror: The time observed by the boy in the mirror is 4 hours 20 minutes. What is the actual time shown on the clock?
A.7 hours 15 minutes B.7 hours 50 minutes C. 7 hours 40 minutes D. 7 hours 35 minutes

4. What is the angle between the two hands of a clock, when the clock shows 3 hours 25 minutes?
A. $45\frac{1^\circ}{2}$ B. 46° C. $46\frac{1^\circ}{2}$ D. $47\frac{1^\circ}{2}$

5. What is the angle between the two hands of a clock, when the time is 2 hours 35 minutes?
A. $122\frac{1^\circ}{2}$ B. $142\frac{1^\circ}{2}$ C. $132\frac{1^\circ}{2}$ D. $116\frac{1^\circ}{2}$

6. The time on the watch is 4:30. If the minute hand points towards the south, the hour hand will point towards
A. South-East B. East C. West D. North-West

7. If the time in clock is 7 hours 15 minutes, then what time does it show on the mirror?
A. 4 hours B. 4 hours 40 minutes C. 4 hours 35 minutes D. 4 hours 45 minutes

8. An accurate clock shows 8 o'clock in the morning. Through how may degrees will the hour hand rotate when the clock shows 2 o'clock in the afternoon?
A. 144º B. 150º C. 168º D. 180º

9. The reflex angle between the hands of a clock at 10.25 is
A. 180° B. 192.5° C. 195° D. 197.5°

10. At what angle are the hands of a clock inclined at 20 minutes past 7?
A. 80° B. 90° C. 100° D. 120°

11. At what angle are the hands of a clock inclined at 4 hours 20 minutes?
A. 5° B. 10° C. 20° D. 25°

12. How many degrees will the minute-hand move in the same time in which the second hand moves 300°?
A. 6° B. 5° C. 4° D. 10°

13. A clock is started at noon. By 10 minutes past 5, the hour hand has turned through:
A. 145° B. 155° C. 158° D. 160°

14. At what angle the hands of a clock are inclined at 15 minutes past 5?
A. 58.5° B. 64° C. 67.5° D. 72°

15. At 3:40, the hour hand and the minute hand of a clock form an angle of:
A. 120° B. 125° C. 130° D. 135

16. At what angle are the hands of a clock inclined at 20 minutes past 7?
A. 80° B. 90° C. 100° D. 120°

17. The angle between the minute hand and the hour hand of a clock when the time is 8.30, is:
A. 80º B. 75º C. 60º D. 105º

18. At what time between 6 and 7 O'clock, are the hands of a clock together?
A. 6 hours $32\frac{8}{11}$ minutes B. 6 hours $33\frac{6}{11}$ minutes
C. 6 hours $34\frac{5}{11}$ minutes D. 6 hours $29\frac{7}{11}$ minutes

19. At what time between 3 and 4 O'clock are the hands of a clock in the opposite direction?

A. 3 hours $48\frac{6}{11}$ minutes
B. 3 hours $49\frac{1}{11}$ minutes
C. 3 hours $50\frac{4}{11}$ minutes
D. 3 hours $47\frac{2}{11}$ minutes

20. The angle between the two hands of a clock is 70°, when the hour hand is between 7 and 8. What time does the watch show?
A. 7 hours $50\frac{10}{11}$ minutes
B. 7 hours $25\frac{5}{11}$ minutes
C. 7 hours $42\frac{8}{11}$ minutes
D. Both (1) and (2)

21. What time does the clock show when the hour hand is between 3 and 4 and the angle between the two hands of the clock is 50°?
A. $8\frac{5}{11}$ min past 3
B. $25\frac{5}{11}$ min past 3
C. $24\frac{6}{11}$ min past 3
D. Both (1) and (2)

22. At what time between 5 and 6 O'clock, will the hands of a clock be at an angle of 62°?
A. 5 hours $17\frac{2}{11}$ minutes
B. 5 hours $38\frac{6}{11}$ minutes
C. 5 hours 16 minutes
D. Both (2) and (3)

23. At what time between 7 and 8 o'clock will the hands of a clock be in the same straight line but, not together?
A. 5 min. past 7
B. $5\frac{2}{11}$ min. past 7
C. $5\frac{3}{11}$ min. past 7
D. $5\frac{5}{11}$ min. past 7

24. How many times in a day, are the hands of a clock in straight line but opposite in direction?
A. 20 B. 22 C. 24 D. 48

25. At what time between 4 and 5 o'clock will the hands of a watch point in opposite directions?
A. 45 min. past 4
B. 40 min. past 4
C. $50\frac{4}{11}$ min. past 4
D. $54\frac{6}{11}$ min past 4

26. At what time between 9 and 10 o'clock will the hands of a watch be together?
A. 45 min. past 9
B. 50 min. past 9
C. $49\frac{1}{11}$ min. past 9
D. $48\frac{2}{11}$ min. past 9

27. A watch, which gains uniformly, was observed to be 4 minutes, slow at 6 a.m. on a Monday. On the subsequent Thursday at 7 p.m. it was noticed that the watch was 6 minutes fast. When did watch show the correct time?
A. 5 p.m. Tuesday B. 4 p.m. Tuesday C. 6 p.m. Tuesday D. 3 p.m. Tuesday

28. The minute-hand of a clock overtakes the hour-hand at intervals of 66 minutes of the correct time. How much in a day does the clock gain or lose?
A. $10\frac{113}{121}$ minutes
B. $11\frac{115}{121}$ minutes
C. $11\frac{109}{121}$ minutes
D. $10\frac{104}{121}$ minutes

29. A watch is 1 minute slow at 1 pm. on Tuesday and 2 minutes fast at 1 pm. on Thursday. When was it show the correct time?
A. 1.00 pm on Wednesday
B. 1.00 am on Wednesday
C. 5.00 pm on Wednesday
D. 5.00 am on Wednesday

30. A watch which gains 5 seconds in 3 minutes was set right at 7 a.m. In the afternoon of the same day, when the watch indicated quarter past 4 o'clock, the true time is:

A. $59\frac{7}{12}$ min. past 3

B. 4 p.m.

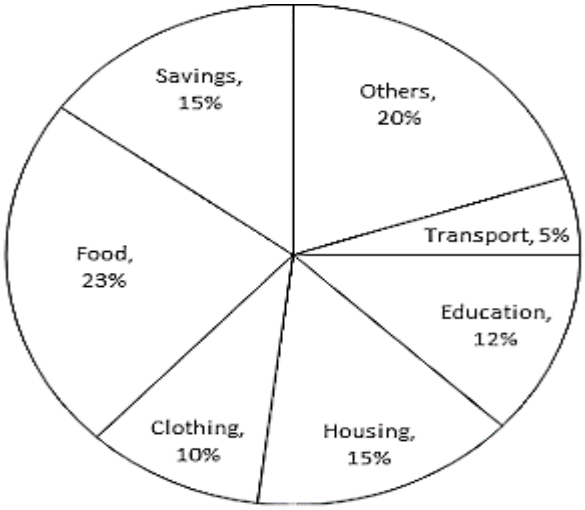
C. $58\frac{7}{11}$ min. past 3

D. $2\frac{3}{121}$ min. past 3

DATA INTERPRETATION

Class Practice Problems

Directions (1-5): Read the following pie-chart to answer the questions given below it:



1. If the total amount spent during the year 1998 was Rs. 46000/-, the amount spent on food, was:
A. Rs. 2000/- B. Rs. 10580/- C. Rs. 23000/- D. Rs. 2300/-

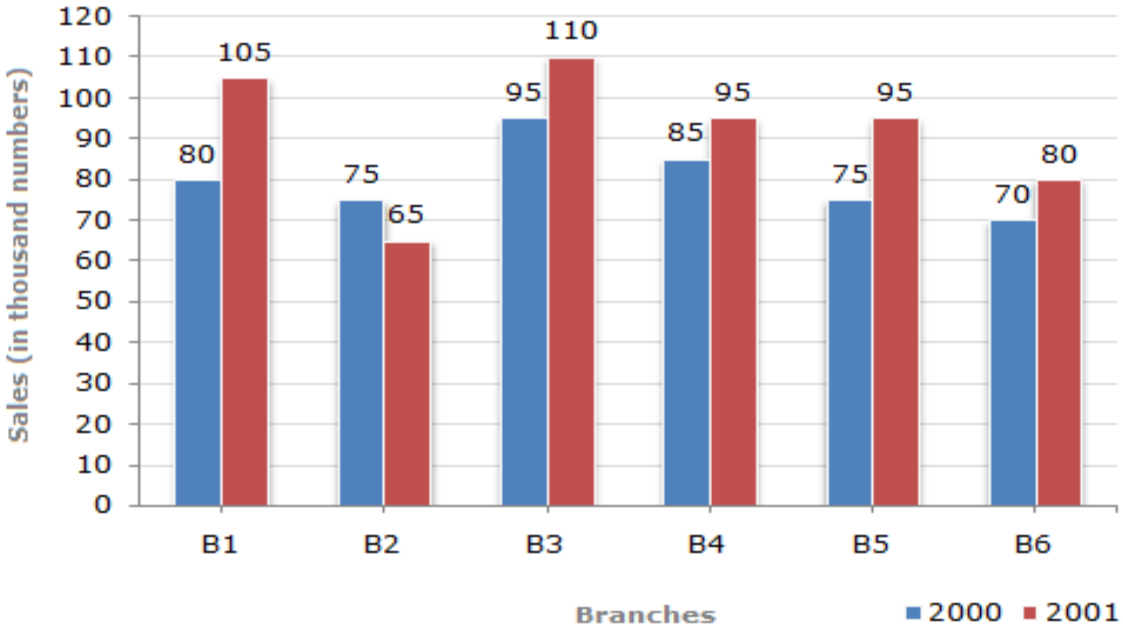
2. If the total amount spent was Rs. 46000/-, how much was spent on clothing and housing together?
A. Rs. 11500/- B. Rs. 1150/- C. Rs. 10000/- D. Rs. 15000/-

3. The ratio of the total amount of money spent on housing to that spent on education was:
A. 5 : 2 B. 2 : 5 C. 4 : 5 D. 5 : 4

4. Graph shows that the maximum amount was spent on:
A. Food B. Housing C. Clothing D. Others

5. If the total expenditure of the family for the year 1998 was Rs. 46000/-, the family saved during the year.
A. Rs. 1500/- B. Rs. 15000/- C. Rs. 6900/- D. Rs. 3067/- approx.

Direction(6-10): The bar graph given below shows the sales of books (in thousand number) from six branches of a publishing company during two consecutive years 2000 and 2001.
Sales of Books (in thousand numbers) from Six Branches - B1, B2, B3, B4, B5 and B6 of a publishing Company in 2000 and 2001.



6. What is the ratio of the total sales of branch B2 for both years to the total sales of branch B4 for both years?
A. 2:3 B.3:5 C.4:5 D.7:9

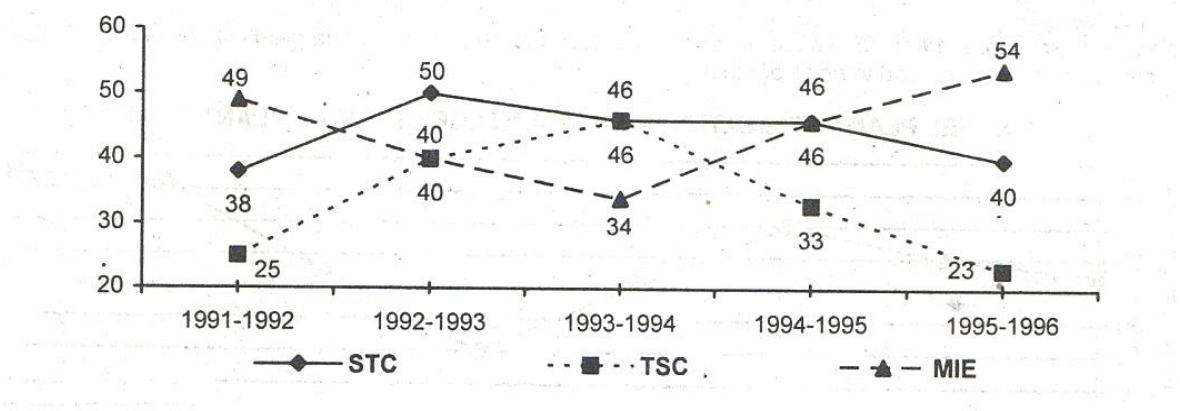
7. Total sales of branch B6 for both the years is what percent of the total sales of branches B3 for both the years?
A. 68.54% B.71.11% C.73.17% D.75.55%

8. What percent of the average sales of branches B1, B2 and B3 in 2001 is the average sales of branches B1, B3 and B6 in 2000?
A.75% B. 77.5% C. 82.5% D. 87.5%

9. What is the average sales of all the branches (in thousand numbers) for the year 2000?
A. 73 B. 80 C. 83 D. 88

10. Total sales of branches B1, B3 and B5 together for both the years (in thousand numbers) is?
A. 250 (B) 310 C. 435 D. 560

Directions for 11 to 15: These questions are based on the line graph given below which represents the Earnings Per Share (EPS) of three companies STC, TSC and MIE for the years 1991-1992 to 1995-1996.
(EPS in Rs.)



$$EPS = \frac{\text{Profit available for Shareholders}}{\text{Number of Shares}}$$

11. If TSC has 15, 000 shares in 1994-1995 and 31, 000 shares in 1995-1996, then find the approximate percentage change in profit available for shareholders from 1994- 1995 to 1995-1996.
A. 35% B. 59.6% C. 44.1% D. 61%

12. If the number of shares of TSC in 1993-1994 is the same as in 1994-1995, then which of the following is true.
A. Ratio of EPS for both these years is the same as that of the profit available from shareholders.
B. Profit available for shareholders for these two years is the same.
C. Ratio of EPS for these two years in half that of the profit available for the share holders.
D. Both (1) and (2)

13. If TSC, STC and MIE have 10, 000, 25, 000 and 15, 000 shares respectively in 1991-1992, then which company has the maximum profit available for shareholders in that year?
A. TSC B. STC C. MIE D. STC and TSC

14. If TSC and STC have Rs. 6 lacs each as profit available for shareholders in 92-93, then the ratio of the number of shares of STC and TSC is
A. 1 : 1 B. 4 : 5 C. 5 : 4 D. 20 : 12

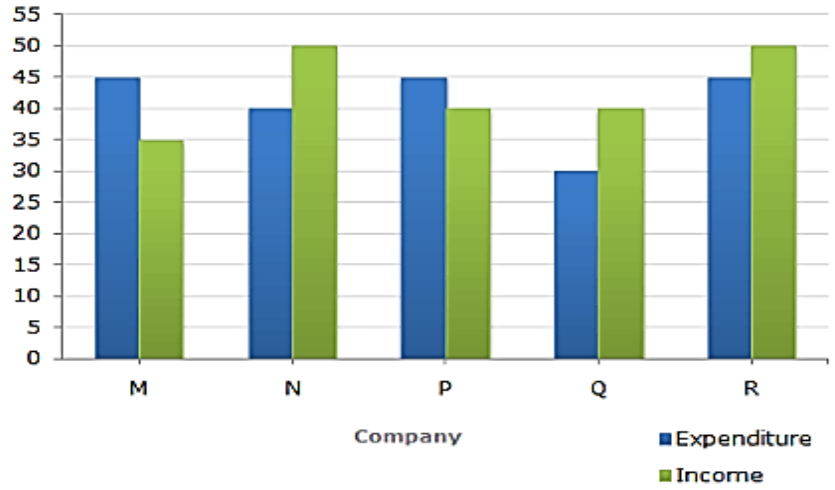
15. If STC has to pay 10% of the profit available for share-holders as tax in the year 1993-1994, then the tax payable for 12, 000 shares is

A. Rs. 62, 200 B. Rs. 55, 200 C. Rs. 60, 000 D. Rs. 50, 000

Direction(16 -20): The following bar graph shows the Income and Expenditures (in million US $) of five companies in the year 2001. The percent profit or loss of a company is given by-

$$\% \text{ Profit/Loss} = \frac{\text{Income - Expenditure}}{\text{Expenditure}} \times 100$$

Income and Expenditure (in million US $) of five companies in the year 2001.



16. The companies M and N together had a percentage of profit/loss of?

A. 12% loss B. 10% C. 10% profit D. no loss or profit

17. In 2001, what was the approximate percentage of profit/loss of all the five Companies taken together?

A. 5% profit B. 6.5% profit C. 4% loss D. 7% loss

18. Which company earned the maximum percentage profit in the year 2001?

A. M B. N C. P D. Q

19. For Company R, if the expenditure had increased by 20% in year 2001 from year 2000 and the company had earned profit of 10% in 2000, what was the Company's income in 2000 (in million US $)?

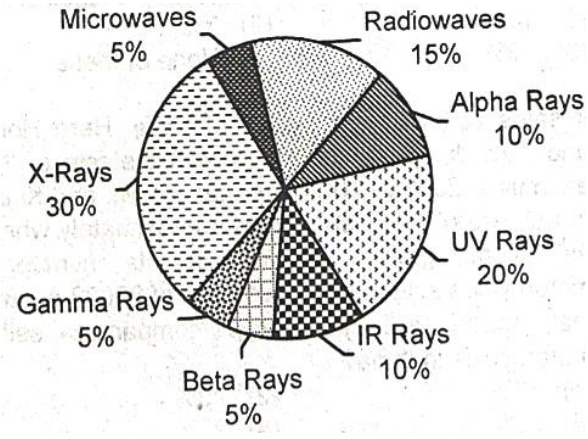
A. 35.75 B. 37.25 C. 38.5 D. 41.25

20. If the income of Company Q in 2001 was 10% more than its income in 2000 and the Company had earned a profit of 20% in 2000, then its expenditure in 2000 (in million US $) was?

A. 28.28 B. 30.30 C. 32.32 D. 34.34

Tutorial Practice Problems

Directions 1 to 5: These questions are based on the pie chart given below.Constituents of Sunrays received in 1 minute



Total sunrays received in 1 minute = 3600 units

1. If the human body can withstand a maximum of 9720 units of IR rays, when exposed to the sun continuously, then what is the maximum time (in minutes) that any person could stand in the sun without crossing the threshold limit of IR rays?
A. 19 B. 23 C. 27 D. 29

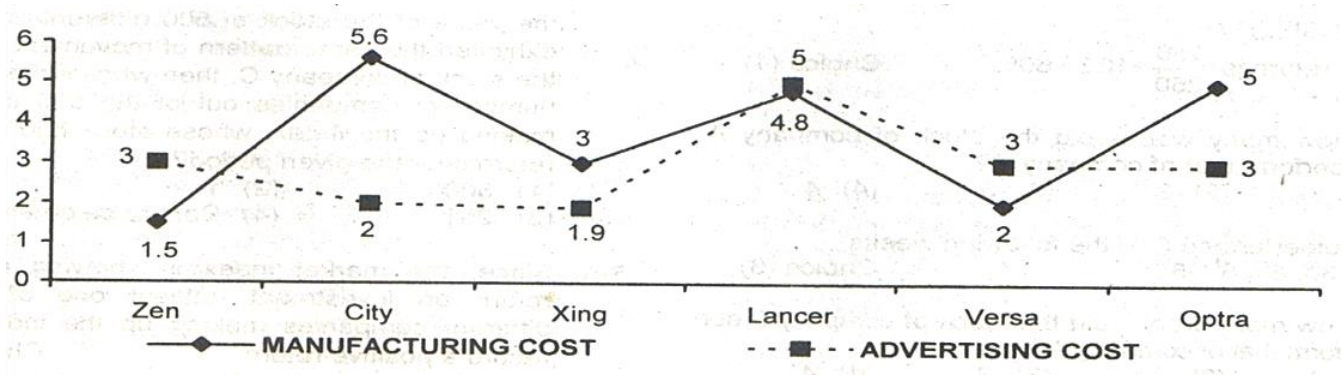
2. The amount of Beta rays in 10 minutes of sunrays is how many times the amount of IR rays in 3 minutes of sunrays?
A. 1.33 B. 1.44 C. 1.66 D. 1.55

3. How many minutes of exposure to the sun in a day would be enough to ensure that the body receives enough amount of Vitamin D, given that the body requires 40 units of Vitamin D every day and that 30 units of Beta rays generate in 1 unit of Vitamin D?
A. $5\frac{2}{3}$ B. $5\frac{1}{3}$ C. $6\frac{1}{3}$ D. $6\frac{2}{3}$

4. The amount of Alpha rays received in 2 minutes is how many more/less than the amount of radio saves received in 4 minutes?
A. 1200 units less B. 1320 units more C. 1440 units less D. 1600 units more

5. If presently the ozone layer in the atmosphere reflects away 60% of the sun's rays then what would the amount of gamma rays received in one minute be, if the ozone layer were to completely disappear?
A. 100 units B. 200 units C.300 units D. 450 units

Directions for 6 to 10: These questions are based on the line graph below.
(in Rs. lakhs)



Total Cost = Manufacturing Cost + Advertising Cost

6. For which of the following cars is the manufacturing cost as a percentage of advertising cost the least?
A. Xing B. City C. Lancer D. Zen

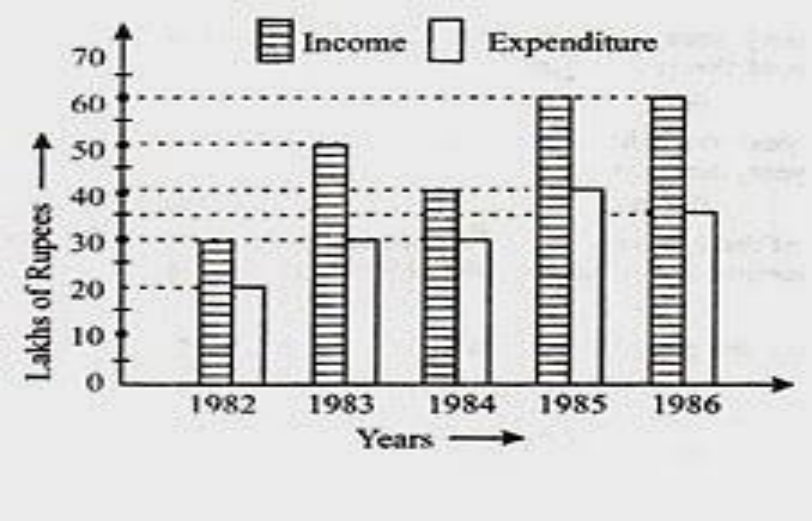
7. In a certain year, 30, 000 "City" cars, are produced, and are sold at Rs. 9.3 lacs/car. If 2% of the total profit is given as a bonus to the 2,040 engineers, the amount received by each engineer as bonus is (in Rs.)
A. 5, 000 B. 50, 000 C. 5 lacs D. None of these

8. Which of the following statements is true?
A. The difference in the manufacturing and the advertising costs of Optra is the same as that of Versa.
B. The ratio of the manufacturing to the advertising cost of Zen is the same as that of Xing.
C. The total cost of Zen and Xing put together is less than the total cost of Lancer.
D. None of these

9. The company that manufactures Zen produces 500 Zen cars per day while the company that manufactures City produces 600 City per day. They sell them at Rs. 6 lacs/car and Rs. 8.4 lacs/car respectively. The profit made by the former is approximately what percentage of that of the latter?
A. 100% B.156% C. 250% D. none of these

10 .The ratio of the manufacturing cost to the total cost is the least for
A. Optra B. Zen C. City D. lancer

Directions: (11–15): Read the graph and answer questions Income and Expenditure of a company over the year (in lakhs of rupees).



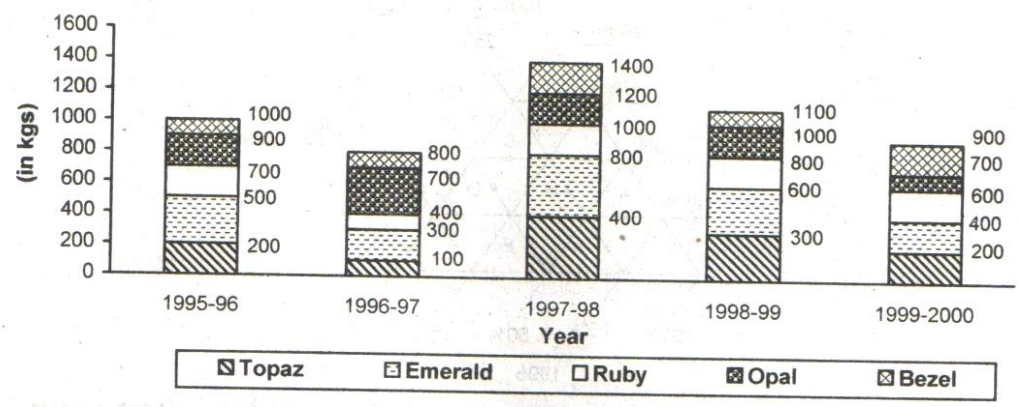
11. The ratio of the average income of all the years to the average profit is :
A. 24 : 13 B. 48 :17 C. 12 : 7 D. 6 : 5

12.Percentage increase in profit in 1986 over 1982 is:
A. 150 % B. 120 % C. 100% D. 80%

13. The total income exceeds the total expenditure over the year 1982 to 1986 by:
A.85 lakhs B. 105 lakhs C. 115 lakhs D. 120 lakhs

14. What is the difference in profit between 1983 and 1984 (in lakhs of rupees) :
A. No profit B. 5 C. 10 D. 15

15. The number of years in which the income is more than the average income of the given year is:
A. One B. Two C. Three D. Four
Directions for 16 to 19: The following questions are based on the stacked bar graph given below.
Sales of various precious stones in India for the period of 1995-1996 to 1999-2000



16. What is the total sales of ruby as a percent of the total sales of precious stones for the given period?
A. 17.3% B. 19.23% C. 23.1% D. None of these

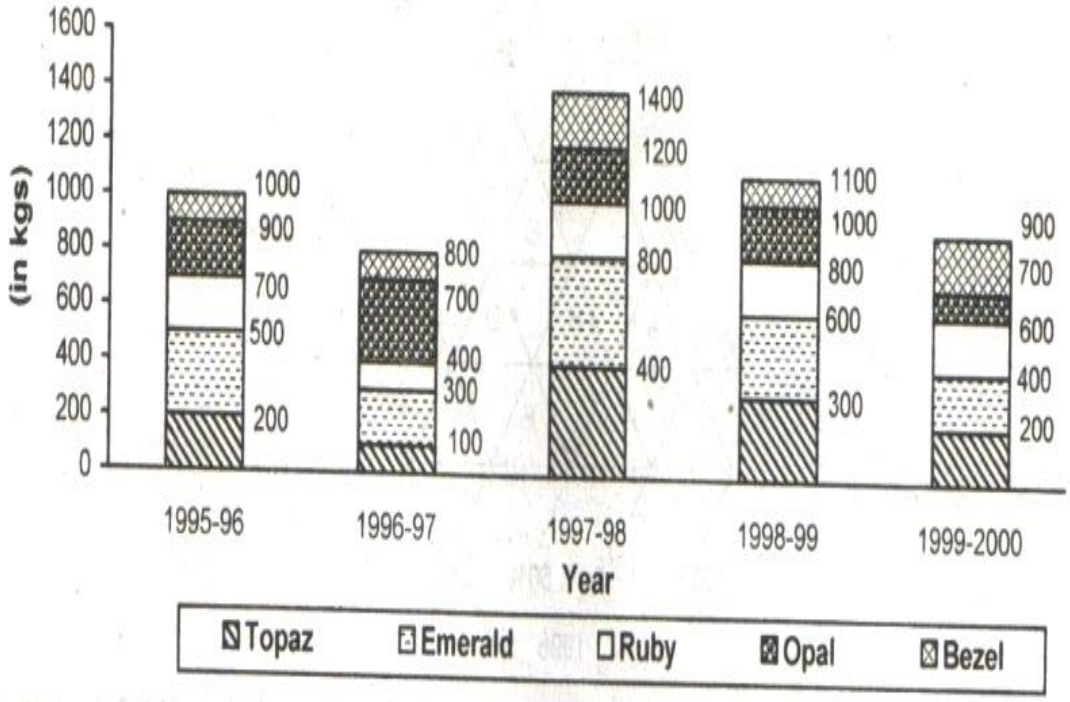
17. By what percent is the average annual sales of Emerald for the given period more than the sales of Opal in 1998-1999?
A. 120% B. 50% C. 25% D. 40%

18. For how many years is the sales of Bezel as a percentage of the total sales of precious stones less than that of Topaz?
A. One B. Two C. Three D. Four

19. If the sales of Topaz increased from 1994-1995 to 1995-1996 by 25% and increased from 1999-2000 to 2000-01 by 50%, then what is the difference between the sales of Topaz in 1994-95 and that in 2000-01?
A. 50, 000 tonnes B. 100, 000 tonnes C. 140, 000 tonnes D. 160, 000 tonnes

Compititive Level Problems

Directions for 1 to 4: The following questions are based on the stacked bar graph given below.
Sales of various precious stones in India for the period of 1995-1996 to 1999-2000



1. What is the total sales of ruby as a percent of the total sales of precious stones for the given period?
A. 17.3% B. 19.23% C. 23.1% D. None of these

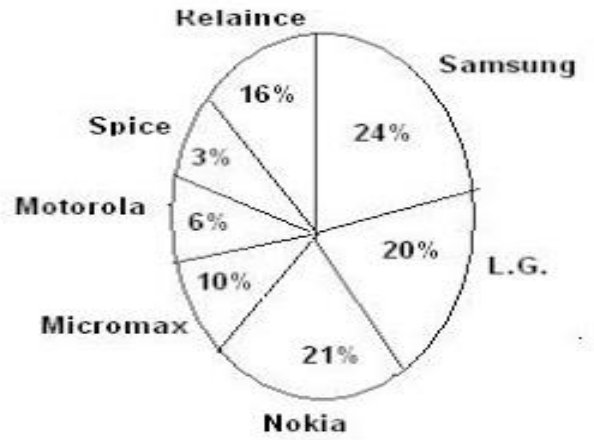
2. By what percent is the average annual sales of Emerald for the given period more than the sales of Opal in 1998-1999?
A. 120% B. 50% C. 25% D. 40%

3. For how many years is the sales of Bezel as a percentage of the total sales of precious stones less than that of Topaz?
A. One B. Two C. Three D. Four

4. If the sales of Topaz increased from 1994-1995 to 1995-1996 by 25% and increased from 1999-2000 to 2000-01 by 50%, then what is the difference between the sales of Topaz in 1994-95 and that in 2000-01?
A. 50, 000 tonnes B. 100, 000 tonnes C. 140, 000 tonnes D. 160, 000 tonnes

Direction for Question 5 to 9: Total numbers of users are 12 crores

Qs 1.



Company Name	Male : Female
L.G.	5:3
Nokia	5:4
Reliance	1:1
Spice	2:1
Micromax	4:5
Motorola	5:7
Samsung	3:2

The table shows the ratio of male to female users among these mobile phone users.

5. What is the total number of females using Nokia phones?
A. 0.96 crore B. 1.4 crore C. 1.12 crore D]1.32 crore

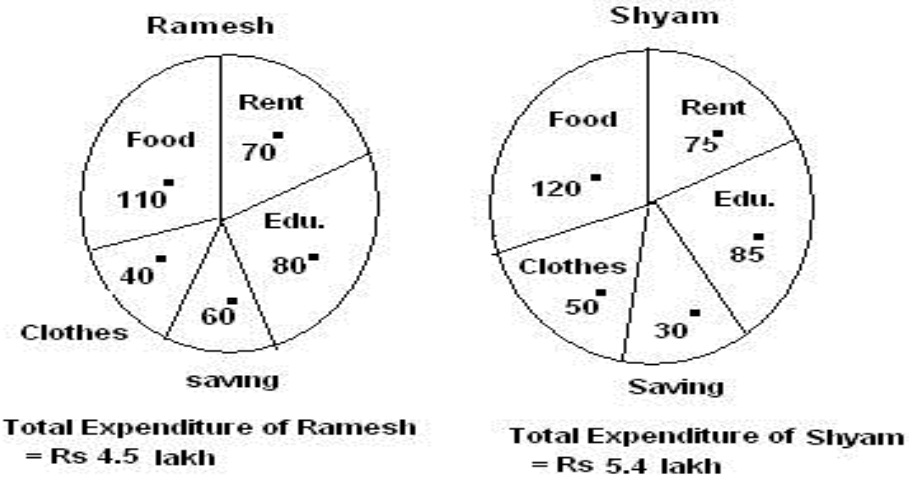
6. What is the difference between the total male and female mobile users?
A. 2.136 crores B. 1.326 crores C. 0.854 crores D. 1.46 crore

7. Number of females L.G. users is what percentage of number of male L.G. users?
A. 90% B. 80% C. 65% D. 60%

8. What is the ratio of the total number of male Spice users and the total number of female Reliance users?
A. 1:2 B. 1:3 C. 1:4 D. 2:3

9. Number of male Motorola users is how much percentage less than that of the number of female Micromax users?
A. 50% B. 123.33% C. 60% D. 55%

Directions for Question 10-15 : Following pie charts show the distribution of annual expenditure of two persons Ramesh and Shyam. Answer the following questions based on these charts. Total expenditure of Ramesh and Shyam is Rs 4.5 and 5.4 lakhs respectively.



10. What is the amount Ramesh and Shyam save yearly?
A. 1.25 lakhs B. 1.20 lakhs C. 1.15 lakhs D. 1.10 lakhs

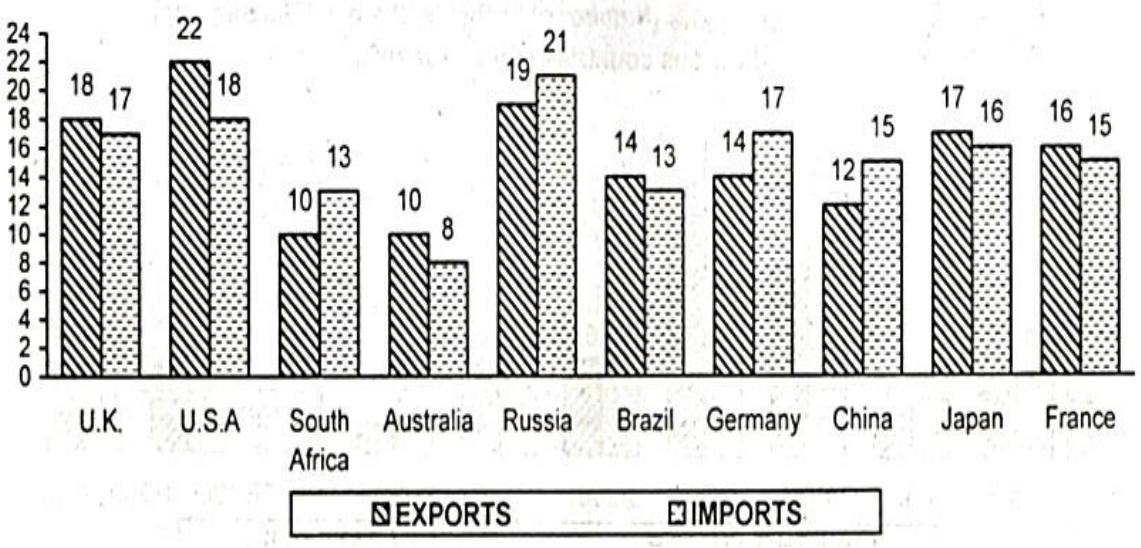
11. What is the ratio of the amount spent on clothes by Ramesh than that of Shyam?
A. 4:5 B. 3:5 C. 2:3 D. 3:4

12. Money spent by Shyam on food is what percentage of the money spent by Ramesh on education?
A. 80% B. 100% C. 120% D. 150%

13. What is the average of the amount spent for house rent by Ramesh and Shyam?
A. 0.75 lakhs B. 0.84 lakhs C. 1 lakhs D. 1.2 lakhs

14. Money spent by Shyam on education is how much percentage more than that of money spent by Ramesh on education?
A. 20% B. 22.5% C. 25% D. 27.5%

Directions for 15 to 19: These questions are based on the following graph.
The Country wise break up Exports/Import of Country 'XYZ' in 1996
(in Rs. thousand crores)



Trade Surplus = Exports – Imports; Trade Deficit = Imports – Exports
15. The cumulative trade deficit of country XYZ is approximately what percent of its average imports from each of the above-mentioned countries?
A. 65% B. 9% C. 6.5% D. 0.6%

16. If the average cost of exports is Rs. 2000 per ton and that of imports of Rs. 3000 per ton, then by what percent is the total tonnage of exports more/less than the total tonnage of imports
A. 33.3% more B. 49% less C. 32.8 % more/less D. 49% more

17. By what percentage are the imports from the country to which the exports are the highest more than the exports to the country from which the imports are the least?
A. 175% B. 80% C. 55.55% D. 125%

18. Which of the following statements is definitely true?
A. Country XYZ has a cumulative trade surplus of Rs. 1 crore
B. The cumulative trade deficit of country XYZ is approximately one-fifteenth of its total imports.
C. The trade deficit of country XYZ considering its trade with China alone is 300% more than its cumulative trade deficit/surplus.
D. The difference between the highest exports to any country and the lowest import from any country is equal to the average of the exports to Brazil and Germany.

19. What is the ratio of the total imports from Brazil, Japan, South Africa, Russia and China to the total exports to the other five countries?
A. 0.975 B. 1.026 C. 0.96 D. None of these

DATA SUFFICIENCY

Class Practice Problems

Directions: Each of the questions below consists of a question and two statements numbered I and II are given below it. You have to decide whether the data provided in the statements 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 in Statement I alone or in Statement II alone are sufficient to answer the question.
Give answer (D) if the data in both the Statements I and II even together are not sufficient to answer the Question.
Give answer (E) if the data in both the statements I and II even together are necessary to answer the question.

1. How is A related to B?
I . A is the sister-in-law of C, who is the daughter-in law of B, who is the wife of D.
II. B is the mother of A's son's only uncle's son.

2. Amongst A, B, C, D, E and F, each are having a different height. Who is the shortest?
I. C is shorter than only B.
II. A is taller than only D and F.

3. Point X is in which direction with respect to Y?
I . Point Z is at equal distance from both point X and point Y.
II. Walking 5 km to the East of point X and taking two consecutive right turns after walking 5 kms before each turn leads to point Y.

4. How is 'must' written in a code language ?
I. You must see is written as "la pa ni" and "did you See" is written as " jo ni pa" in that code language.
II. "You did that" is written as " pa si jo" in that code language .

5. On which day of the week does Arti's birthday fall ?
I. Sonu correctly remembers that Arti's birthday falls after Wednesday but before Sunday.
II. Raj correctly remembers that Arti's birthday falls before Friday but after Tuesday .

6. How is J related to M ?
I. M has only one brother and two sisters.
II. J is daughter of T who is wife of M .

7. On which day was Yasir born ? (His date of birth is February 29 .)
I. He was born between year 2005 and 2011.
II. He will complete 4 years on February 29, 2012.

8. Out of 64 students, 38 play both chess and cricket. How many students play only chess ?
I. Out of 64 students , 22 students don't play any game. 4 students play only cricket .
II. Out of 64 students, 20 are girls and 10 of them don't play any game.

9.What is the total number of students in the school?
I. The ratio of girls to boys is 2 : 3
II. The number of students has grown by 5% this year as compared to 4% last year from the number 2001, which it was year before last .

10. Who among the six of them is the tallest if Geeta is taller than Shilpa and Deepa is taller than Meena ? (Sunita and Sadhana are the other two.) .

I. Sadhana is taller than Sunita.
II. Sadhana is taller than Shilpa and Meena as well as Deepa.

Directions for data sufficiency questions (11-20):

a) If data in the statement I alone is sufficient to answer the question.
b) If data in the statement II alone is sufficient to answer the question.
c) If data either in the statement I alone or statement II alone are sufficient to answer the question.
d) If data given in both I & II together are not sufficient to answer the question.
e) If data in both statements I & II together are necessary to answer the question

11. What is Monica's position with respect to Rahul?
1. In a row of 25 students, Monica is sitting 12th from right end of row and Rahul is sitting 20th from left end of the row.
2. Monica is 4th from right end and Rahul is 8th from left end.

12. Who has secured less marks among P, Q, R , S & T ?
1. S has secured less marks than only R and T.
2. Q secured more marks than P.

13. On which floor is Shikha residing?
1. In a six storey building (Ground floor is parking space), Rekha is on fourth floor. Shikha likes to reside only on even numbered floors. Reema is not on the topmost floor.
2. Reema is two floors below Peter who is 3 floors above Shikha.

14. Amit is facing which direction?
1. Shikha is facing east direction and if she turns to her right she will face Raj.
2. Amit is facing opposite direction as that of Kiran who is facing Shikha.

15. In which month is Meena's birthday?
1. Shikha remembers that Meena's birthday was 4 months ago.
2. Raj remembers that after 2 months from now, Meena's birthday will be 6 months back

16. Among A, B, C, D and E, seated in a straight line,facing North, who sits exactly in the middle of the line?
I. A sits third of left of D. B sits to the immediate right of C.
II. B sits second to right of A. E is not an immediate right of C.

17. A six storey building (consisting of an unoccupied ground floor and five floors on top of the ground floor numbered 1, 2, 3, 4 and 5) houses different people viz. A, B, C, D and E. who lives on the third floor. ?
I. C lives on an even numbered floor. A lives immediately above D. B lives immediately above A . E does not live on the topmost floor .
II. D lives on an-odd numbered floor . A and B are immediate neighbours of each other . Similarly, C and E are immediate neighbours of each other, C does not live on an odd numbered floor.

18. Are all the four friends Abhay , Kavita Prashant an Yasir who are sitting around a circular table facing the centre.
I. Kavita sits second to left of Abhya. Abhay faces the centre. Yasir sits to the immediate right of Abhay as well as Kavita.
II. Prashant sits third to the right of Kavita . Abhay sits to immediate right of Prashant as well as yasir.

19. Is R the granddaughter of C ?
I. The only sister of A is the mother of R's brother, B.
II. C, the mother of A has only one grandson, B.

20. Who is oldest among Pete, Kevin, Joseph and Jason ?
I. Jason is older than Peter and Joseph.
II. Kevin is younger than Joseph.

Tutorial Practice Problems

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Give answer (D) if the data in both the Statements I and II even together are not sufficient to answer the Question.
Give answer (E) if the data in both the statements I and II even together are necessary to answer the question.

1. How is "sure" written in a code language ?
I. " he is sure" is written as "ja ha ma" is that code language.
II. "is she sure" is written as "ka ja ma" is that code language.

2. Among P, Q,R, S and T each having different age, who is the youngest among them ?
I. Q is younger than only P.
II. S is older than only R.

3. On which day of the week did Sourav visit Delhi ?
I. Sourav visited Delhi after Monday but before Thursday but not on an odd day of the week.
II. Sourav visited Delhi before Friday but after Monday

4. What is R's position from the left end in a row?
I. M is tenth from the left end of the row.
II. There are sixteen children between M and R.

5. Town P is towards which direction of town T ?
I. Town T is towards South of town K, which is towards West of town P.
II. Town P is towards South of town V and towards East of town T .

6. On which date is Arit's birthday is September 2010 ? I. Last year his birthday was on the last Thursday of the month in September 2010 ?
II. This year his birthday will be on the last Friday of the months in September 2010 .

7. How is "never" written is code language ?
I. " never ever go there" is written as " na ja ni ho" is that code language.
II. " go there and come back" is written as " ma ho sa ni da" is that code language.

8. Among M, P, K , J, T and W who is lighter than only the heaviest ?
I. P is heavier than M and T.
II. W is heavier than P but lighter than J who is not the heaviest .

9. What does "$" mean in a code language ?
I. " 5 $ # 3" means "flowers are really good".
II. " 7 # 3 5" means "good flowers ane available .

10.How is P related to J ?
I. M is brother of P and T is sister of P.
II. P's bother is married to J's husband who has one son and two daughters.

Directions for data sufficiency questions (11-20):

a) If data in the statement I alone is sufficient to answer the question.
b) If data in the statement II alone is sufficient to answer the question.
c) If data either in the statement I alone or statement II alone are sufficient to answer the question.
d) If data given in both I & II together are not sufficient to answer the question.
e) If data in both statements I & II together are necessary to answer the question

11. Who is taller among P, Q, R, S & T?
1. S is shorter than Q. P is shorter than only T.
2. Q is taller than only S. T is taller than P and R.

12. What is the distance between point P and point Q?
1. Point R is 10 m west of point P and point S is 10 m north of point P.
2. Point Q is 10 m south-east of point R. Point S is 20 m north-west of point Q.

13. How is Shubham related to Shivani?
1. Shubham is brother of Meenal. Shivani is niece of Pooja.
2. Neeraj is Meenal's uncle and Preeti's brother

14. How is PRODUCT written in that code language?
1. In a certain code language, AIEEE is written as BJFFF.
2. In a certain code language, GYPSY is written as FXORX

15. How is 'face' written in that code language?
1. In a certain code language, 'no one with face' is coded as 'fo to om sop' and 'no one has face' is coded as 'om sit fo sop'
2. In a certain code language, 'face of no light' is coded as 'om mot fo kiz' and 'no one is smart' is coded as 'sop fo sip lik'.

16. How is "happy" written in a code language ?
I. "I happy today" is written as" ke ne que" and "today happy day" is written
II. "I play is written as "que pa" .

17. H is the mother of J. How is J related to V ?
I. V is the only daughter of H.
II. V is the sister of J.

18. What is the colour of white snow in a colour code?
I. Green is called Black, Black is called Blue, and Blue is called Red.
II. Red is called White and White is called Orange.

19. Six people P, Q, R, S , T and U are seated around acircular table and are equidistant from each other. Who is second to the right of T ?
I. P is to the immediate left of Q and Q sits opposite R.
II. S is to the immediate left of U.

20. In a six storey building (Consisting of floors numbered 1, 2,3,4,5 and 6. The ground floor is numbered 1, the floor above it is numbered 2 and so on) the third floor is unoccupied . The building houses different people viz. P, Q, R, S and T, each living on a different floor. On which of the floors does T live ?
I. S lives between the floors on which R and T live.
II. There are two floors between T's floor and Q's floor.

Competitive Level Problems

1. Among five friends A, B, C, D and E sitting around a circular table and facing the centre, who is sitting to the immediate left of A ?
I. A sits third to the right of B, D is not an immediate neighbour of B.
II. B is an immediate neighbour of C.

2. Is X the wife of Y ?
I. X's daughter M is the only sister of R. R is the son of Y.
II. The mother of Y has only one grandson R.

3. How many employees are enrolled with the company
I. The Employee Engagement survey was administered to all employees in the company .
II. A total of 346 Employee Engagement. Surveys were returned to the HR department.

4. What was the grand total of Team A ?
I. Joseph correctly remembers that Team A scored a grand total of above 85 but below 94 points.
II. Surekha correctly remembers that Team A scored a grand total of above 80 and below 87 points

5. P, Q, R, S and T are seated around a circular table facing the centre, such that there is equal space between each of the adjacent members. Who sits to the immediate right of T ?
I. Q sits second to the right of T and S sits second to the left of T.
II. R is not am immediate neighbour of either P or Q.

6. Which directions is Khartik facing at the moment ?
I. After walking 4 meters early morning from point A, khartik is facing the opposite direction the sun .
II. Khartick took two consecutive left turns after covering a distance of 3 meters to reach point A.

7. Point A is towards which direction from point B.
I. If a person walks 5m towards West from point A, takes a left turn and walk 5m again, he would be 4m away from point B.
II. Point A is towards the North of point C, point C is towards the East of point D and point B is towards the East of point D.

8. Is S the mother of M ?
I. M is sister of Q, Q is sister of R and R is daughter of S.
II. M is daughter of L and L is sister of V.

9. Are all the five friends viz. A, B, C , d and E who are seated around circular table facing the centre.
I. A sits third to the right of D, D faces the centre. B sits second to the right of A.
II. C sits second to the left of E. E faces the centre . D sits second to the right of C.

10. How is " came" written is the code language?
I. " We came by car" is written as " 4 9 2 8" and " can we buy car" is written as "5 8 0 2" .
II. " can car be cheap" is written as " 8 1 5 3"and "came by cheap car" is written as "9 8 4 1" .

11. Which bag amongst P ,W, R,S and T is the heaviest?
I . Bag Q is heavier than R and S. . Bag T is heavier only than bag P .
II. Only three bags are lighter than R. The weight of bag Q is 50 kg . which is 2 kg . more than bag R .

12. Are all the five friends viz. A, B, C D and E who are seated around a circular table facing the centre ?
I. A sits third to the left of B. B faces the centre. D and E are immediate neighbours of each other . C sits second to right of E.
II. D sits second to right of C. C faces the centre. Both E and A are immediate neighbours of D. B ists second to right of A.

13. Is the time in the clock 9 o' clock now ?
I. After half an hour, the minute and minute and the hour hands of the clock will make an angle of exactly 900 with each other.
II. Exactly 15 minutes back, the hour and the minute's hand of the clock coincided with each other.

14. Is F the granddaughter of B ?
I. B is the father of M. M is the sister of T. T is the mother of F.
II. S is the son of F. V is the daughter of F . R is the brother of T.

15. How many daughters does W have ?
I. B and D are sisters of M.
II. M's father T is husband of W.
III. Out of the three children which T has only one is a boy .

16. Who among A, B, C , D E and E each having a different height, is the tallest ?
I. B is taller than A but shorter than E.
II. Only two of them are shorter than C.
III. D is taller than only F.
(1) Only I and II
(2) Only II and III
(3) Only I and III
(4) All I, II and III are required to answer the question
(5) All I, II and III are not sufficient to answer the question.

17. Towards which direction is village J from village W?
I. Village R is to the west of Village W and to the north of Village T.
II. Village Z is to the east of Village J and to the south of Village T.
III. Village M s to the north east of Village J and north of Village Z.
(1) Only III
(2) Only II and III
(3) All I, II and III are required to answer the question.
(4) Question cannot be answered even with all I , II and III
(5) None of these

18. How is the "go" written in a code language ?
I. " now or never again" is written as " torn ka na sa" in that code language .
II." you come again now" is written as " ja ka ta sa" in that code language
III. "again go now or never "; is written as " na ho ka sa torn" in that cod language
(1) Only I and IIII
(2) Only Ii and III
(3) Only I and II
(4)) All I II and III are required to answer the question
(5) None of these

Time & Work									
Class Practice Problems									
1-C	2-D	3-C	4-D	5-C	6-C	7-D	8-A	9-D	10-A
11-A	12-B	13-B	14-D	15-A	16-A	17-C	18-C	19-A	20-B
21-C	22-D	23-A	24-B	25-D					
Tutorial Practice Problems									
1-B	2-B	3-B	4-B	5-B	6-D	7-B	8-C	9-C	10-C
11-D	12-B	13-B	14-B	15-B	16-B	17-B	18-B	19-D	20-C
21-A	22-B	23-D	24-B	25-D					
Competitive Level Problems									
1-B	2-C	3-D	4-B	5-B	6-D	7-A	8-C	9-C	10-D

Pipe & Cistern Answer Key									
1-C	2-B	3-D	4-B	5-D	6-B	7-A	8-D	9-C	10-B
11-D	12-D	13-A	14-B	15-C	16-B	17-A	18-B	19-B	20-A

Time Speed & Distance									
Class Practice Problems									
1-A	2-D	3-B	4-B	5-B	6-B	7-A	8-C	9-B	10-A
11-C	12-B	13-C	14-A	15-A	16-C	17-A	18-C	19-D	20-C
21-D	22-D	23-C	24-B	25-B					
Tutorial Practice Problems									
1-D	2-B	3-A	4-B	5-B	6-B	7-C	8-B	9-D	10-A
11-B	12-D	13-A	14-B	15-D	16-C	17-C	18-D	19-D	20-B
21-B	22-B	23-B	24-C	25-D					
Competitive Level Problems									
1-A	2-A	3-C	4-B	5-D	6-B	7-B	8-D	9-B	10-D

Problems on Trains Answer Key									
1-D	2-C	3-B	4-B	5-C	6-D	7-B	8-B	9-B	10-B
11-B	12-C	13-C	14-C	15-B	16-D	17-A	18-B	19-A	20-A
21-B	22-B	23-C	24-B	25-B	26-A	27-C	28-D	29-D	30-C

Boat & Stream Answer Key									
1-C	2-B	3-B	4-B	5-C	6-C	7-C	8-B	9-B	10-A
11-B	12-A	13-D	14-C	15-B	16-A	17-B	18-C	19-D	20-C

Syllogism									
Class Practice Problems									
1-C	2-C	3-C	4-B	5-D	6-D	7-A	8-D	9-D	10-B
11-D	12-C	13-B	14-C	15-D	16-B	17-C	18-D	19-D	20-C
21-D	22-D	24-A	25-D						
Tutorial Practice Problems									
1-D	2-C	3-D	4-C	5-D	6-D	7-C	8-D	9-B	10-A
11-D	12-C	13-B	14-D	15-B	16-B	17-C	18-D	19-D	20-C
21-B	22-D	23-B							
Competitive Level Problems									
1-D	2-D	3-D	4-C	5-B	6-E	7-E	8-A	9-C	10-E

Number Ranking Test									
Class Practice Problems									
1-C	2-B	3-B	4-B	5-D	6-A	7-C	8-D	9-B	10-B
11-D	-D	13-A	14-B	15-C	16-C	17-C	18-D	19-D	20-B

21-C	22-B	23-A	24-C	25-B					
Tutorial Practice Problems									
1-A	2-B	3-B	4-B	5-A	6-D	7-D	8-A	9-B	10-A
11-A	12-D	13-D	14-A	15-B	16-D	17-A	18-D	19-A	20-C
21-C	22-C	23-D	24-B	25-A					
Competitive Level Problems									
1-D	2-C	3-B	4-C	5-B	6-D	7-C	8-C	9-C	10-D

Mensuration									
Class Practice Problems									
1-A	2-C	3-B	4-A	5-A	6-A	7-D	8-C	9-C	10-B
11-A	12-D	13-C	14-D	15-D	16-A	17-D	18-B	19-A	20-D
Tutorial Practice Problems									
1-B	2-D	3-C	4-C	5-C	6-A	7-B	8-D	9-B	10-B
11-A	12-B	13-A	14-B	15-D	16-D	17-A	18-D	19-C	20-A
Competitive Level Problems									
1-A	2-B	3-C	4-D	5-C	6-C	7-B	8-B	9-C	10-C

Height & Distance									
Class Practice Problems									
1-B	2-A	3-D	4-C	5-D	6-A	7-D	8-B	9-D	10-D
11-D	12-B	13-A	14-B	15-B					
Tutorial Practice Problems									
1-D	2-B	3-D	4-B	5-A	6-A	7-C	8-C	9-B	10-A
11-C	12-C	13-A	14-C	15-D					

Competitive Level Problems									
1-C	2-C	3-C	4-D	5-B	6-D	7-C	8-D	9-B	10-A

Seating Arrangements									
Linear Arrangement									
1-C	2-B	3-C	4-B	5-A	6-D	7-D	8-E	9-A	10-B
11-A	12-C	13-B	14-A	15-C	16-B	17-B	18-D	19-C	20-B
21-E	22-E	23-D							
Circular Arrangement									
1-B	2-C	3-A	4-E	5-E	6-A	7-5	8-D	9-D	10-C
11-A	12-1	13-2	14-C	15-A	16-C	17-B	18-C	19-D	20-B
21-A									
Tutorial Practice Problems									
1-D	2-A	3-B	4-B	5-C	6-E	7-D	8-A	9-C	10-B
11-2	12-A	13-C	14-C	15-D	16-C	17-A	18-D	19-D	20-B
21-E	22-E	23-B	24-C	25-A					

Calendar Answer Key									
1-B	2-C	3-A	4-A	5-D	6-A	7-D	8-C	9-C	10-C
11-A	12-C	13-D	14-D	15-A	16-C	17-A	18-C	19-A	20-A
21-A	22-B	23-B	24-A	25-D	26-D	27-D	28-D	29-C	30-B
Clock Answer Key									
1-D	2-C	3-C	4-D	5-C	6-A	7-D	8-D	9-D	10-C
11-B	12-B	13-B	14-C	15-C	16-C	17-B	18-A	19-B	20-D
21-B	22-D	23-D	24-B	25-D	26-C	27-B	28-C	29-D	30-B

Data Interpretation									
Class Practice Problems									
1-B	2-A	3-D	4-A	5-C	6-D	7-C	8-D	9-B	10-D
11-C	12-A	13-B	14-D	15-B	16-D	17-A	18-D	19-D	20-B
Tutorial Practice Problems									
1-C	2-C	3-D	4-C	5-D	6-D	7-B	8-C	9-D	10-B
11-B	12-A	13-A	14-C	15-C	16-D	17-C	18-C	19-A	
Competitive Level Problems									
1-D	2-C	3-C	4-A	5-C	6-B	7-D	8-C	9-D	10-B
11-C	12-B	13-C	14-D	15-C	16-D	17-B	18-D	19-A	

Data Sufficiency									
Class practice Problems									
1-D	2-D	3-B	4-A	5-E	6-B	7-C	8-A	9-B	10-D
11-A	12-A	13-E	14-D	15-D	16-E	17-A	18-C	19-E	20-E
Tutorial Practice Problems									
1-D	2-B	3-A	4-B	5-A	6-C	7-D	8-E	9-E	10-E
11-C	12-D	13-D	14-E	15-E	16-D	17-A	18-B	19-E	20-D
Competitive Level Problems									
1-A	2-D	3-D	4-E	5-E	6-A	7-A	8-E	9-C	10-D
11-B	12-D	13-C	14-D	15-B					