WORKBOOK OF ANALYTICAL SKILLS-II

PEA-516

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

NUMBER SERIES

Series completion

In this type of questions, some numbers and/or alphabetical letters are given. They all form a series and the series changes in certain order.

The series may also have one or more numbers/letters missing.

The candidates are required to observe that specific order in which the series changes and then complete the series.

Similarly, the candidates have to decide about the missing letter or number that would suit for the blank space if they continue to change in some order. Some common types are explained in the following slides.

Types of Series:

Number SeriesAlpha series Letter series

Number and letter Analogy

Tricks to solve series completion

Step 1: Observe are there any familiar numbers in the given series like primes numbers, perfect squares,cubes and so on which are easy to identify.

Step 2: Calculate the differences between the numbers. Observe the pattern in the differences.

If the differences are growing rapidly it might be a square series, cube series or multiplicative series. If the numbers are growing slowly, then it is an addition or subtraction series.

If the differences are not having any pattern then,

1. It might be a double or triple series. Here every alternate number or every 3rd number forms series
2. It might be a sum or average series. Here sum of two consecutive numbers gives 3rd number or average of first two numbers give next number.

Step 3: Sometimes number will be multiplied and will be added another number.

Types of number series:

I. Prime number Series:

Example: 2, 3,5,7,11,13,

Solution: The given series is prime number series. The next prime number is 17.

Example: 2, 5, 11,17,23,41.

Solution: The prime numbers are written alternately.

II. Difference Series:

Example: 2, 5, 8,11,14,17... 23.

Answer: The difference between the numbers is 3. (17+3 = 20)

Example: 45, 38,31,24,17... 3.

Answer: The difference between the numbers is 7. (17-7=10).

III. Multiplication Series:

Example: 2, 6, 18, 54,162... 1458.

Answer: The numbers are multiplied by 3 to get next number. (162x3 = 486).

IV. n^2 Series:

Example: 1, 4, 9, 16, 25,....., 49

Answer: The series is 1^2, 2^2, 3^2, 4^2, 5^2, ... The next number is 6^2=36;

Example : 0, 4, 16, 36, 64,..... 144.

Answer: The series is 0^2, 2^2, 4^2, 6^2, etc. The next number is 10^2=100.

V. n^2-1 Series :

Example : 0, 3, 8, 15, 24,35, 48,.....,

Answer : The series is 1^2-1, 2^2-1, 3^2-1 etc. The next number is 8^2 -1=63.

Another logic : Difference between numbers is 3, 5, 7, 9, 11, 13 etc. The next number is (48+15=63).

VI.n^2 +1 Series :

Example: 2, 5, 10, 17, 26, 37,..... , 65.

Answer: The series is 1^2+1, 2^2+1, 3^2+1 etc. The next number is 7^2+1=50.

Example: 3,12,48,192,.....,3072.

Answer : The numbers are multiplied by 4 to get the next number. (192x4 =768).

VII. Division Series:

Example : 720, 120, 24,..... ,2,1

Answer: 720/6=120, 120/5=24, 24/4=6, 6/3=2, 2/2=1. **

Example : 32, 48, 72, 108,....., 243.

Answer: . Number x 3/2= next number. 32x3/2=48, 48x3/2=72, 72x3/2=108, 108x3/2=162.

VIII. n^2+n Series (or) n^2-n Series :

Example : 2, 6, 12, 20,..... , 42.

Answer : The series is 1^2+1, 2^2+2, 3^2+3, 4^2+4 etc. The next number = 5^2+5=30.

Another Logic : The series is 1x2, 2x3, 3x4, 4x5. The next number is 5x6=30.

Another Logic : The series is 2^2-2, 3^2-3, 4^2-4, 5^2-5. The next number is 6^2-6=30.

IX. n^3 Series :

Example : 1, 8, 27, 64, 125, 216, ...

Answer : The series is 1^3, 2^3, 3^3, etc. The missing number is 7^3=343.

X. n^3+1 Series :

Example : 2, 9, 28, 65, 126, 217, 344, ...

Answer : The series is 1^3+1, 2^3+1, 3^3+1, etc. The missing number is 8^3+1=513.

XI. n^3-1 Series :

Example : 0, 7, 26, 63, 124,..... , 342.

Answer: The series is 1^3-1, 2^3-1, 3^3-1 etc. The missing number is 6^3-1=215.

XII. n^3+n Series :

Example : 2, 10, 30, 68, 130,....., 350.

Answer : The series is 1^3+1, 2^3+2, 3^3+3 etc .The missing number is 6^3+6=222.

XIII. n^3-n Series :

Example :0, 6, 24, 60, 120, 210,..... ,

Answer : The series is 1^3-1, 2^3-2, 3^3-3, etc. The missing number is 7^3-7=336.

Another Logic : The series is 0x1x2, 1x2x3, 2x3x4, etc. The missing number is 6x7x8=336.

XIV. n^3+n^2 Series :

Example : 2, 12, 36, 80, 150,.....,

Answer: The series is 1^3+1^2,2^3+2^2,3^3+3^2etc. The missing number is 6^3+6^2=252

XV. n^3-n^2 Series

Example: 0,4,18,48,100,.....,

Answer : The series is 1^3-1^2,2^3-2^2,3^3-3^2 etc. The missing number is 6^3-6^2=180

XVI. xy, x+y Series:

Example: 48,12,76,13,54,9,32,.....,

Answer : 4+8=12, 7+6=13, 5+4=9 , 3+2=5.

XVII. Factorial Series:

Example: 1,1,2,6,24,120,.....,

Answer : 0!=1, 1!=1, 2!=2, 3!=6, 4!=24, 5!=120, 6!=7

Class Practice Problems

1. In following question, a number series is given with one term missing. Choose the correct alternativethat will same pattern and fill in the blank spaces.: 1, 4, 9, 16, 25, x

   A. 35 B. 36 C. 48 D. 49

2. In following question, a number series is given with one term missing. Choose the correct alternative thatwill same pattern and fill in the blank spaces.: 1, 6, 13, 22, 33,

   A. 44 B. 45 C. 46 D. 47

3. In following question, a number series is given with one term missing. Choose the correct alternativethat will same pattern and fill in the blank spaces.: 19, 2, 38, 3, 114, 4…

   A. 228 B. 256 C. 352 D. 456

4. In following question, a number series is given with one term missing. Choose the correct alternative thatwill same pattern and fill in the blank spaces.: 4, 5, 9, 18, 34,..

   A. 43 B. 49 C. 50 D. 59

5. In following question, a number series is given with one term missing. Choose the correct alternative that will same pattern and fill in the blank spaces.: 2, 1, 2, 4, 4, 5, 6,7,8,8,10,11,

   A. 9 B. 10 C. 11 D. 12

6. In following question, a number series is given with one term missing. Choose the correct alternative thatwill same pattern and fill in the blank spaces.: 11, 10, (…….), 100, 1001, 1000, 10001

   A. 101 B. 110 C. 111 D. None of these

7. In following question, a number series is given with one term missing. Choose the correct alternative thatwill same pattern and fill in the blank spaces.: 123456147, 12345614, 2345614, 234561,

   A. 3456 B. 2345 C. 23456 D. 34561

8. In following question, a number series is given with one term missing. Choose the correct alternative thatwill same pattern and fill in the blank spaces.: In the Series 3, 9, 15, … what will be the 21st term ?

   A. 117 B. 121 C. 123 D. 129

9. In following question, a number series is given with one term missing. Choose the correct alternative thatwill same pattern and fill in the blank spaces.: Which term of the series 5, 8, 11, 14, … is 320 ?

   A. 104th B. 105th C. 106th D. 64^{th}

10. In following questions, one term in number series is incorrect. : Find out the incorrect number 24, 27,31, 33, 36

A. 24 B. 27 C. 31 D. 33

Direction (11-20) Find the next one…

11. 8,17,35,71,143,__
a.287 b.299 c.285 d.286

1. 3 , 5, 9, 17, 33 __
a. 60 b. 62 c. 65 d. 64

2. 98 72 50 32 18 __
a.10 b.8 c.6 d.12

3. 46 ,60, 52, 54 ,58 ,48 __
a. 64 b. 54 c. 66 d. 58

4. 20,20,19,16,17,13,14,11 _ _
a. 11,13 b. 12,12 c.10,10 d. 10,12

5. 500,356,456,392 __
a. 400 b. 418 c. 430 d. 428

6. 41,42,41,45,37,46,__
a.56 b.19 c.28 d.62

7. 4,6,9,14,21,32,__
a.45 b.48 c.51 d.55

8. 3,7,17,31,53__
a.71 b.69 c.79 d.83

9. 6,24,96,384, __
a.1568 b.1563 c.1655 d.1536

Tutorial Practice Problems

What will come next

1. 1,2,6,21,88,445, __
a.2760 b.2600 c.2670 d.2676
2. 10,17,26,37,50, __
a.65 b.63 c.71 d.66
3. 20,30,42,56,72,__
a.91 b.88 c.92 d.90

4. 56,42,30,20,12,__
   a.6 b.8 c.10 d.12
5. 65,126,217,344,__
   a.516 b.315 c.513 d.520
6. 0,7,26,63,124,__
   a.215 b.217 c.213 d.218
7. 64040,27030,8020,__
   a.1000 b.1010 c.1800 d.1001
8. 0,6,24,60,120,__
   a.212 b.200 c.210 d.212
9. 24,12,12,18,36,__
   a.42 b.44 c.90 d.88
10. 5,16,49,104,__
    a.181 b.180 c.172 d.176
11. 9,27,31,155,161,1127,__
    a.1603 b.12764 c.1135 d.34178
12. 8,8,32,288,4608,___
    a.115200 b.115300 c.115000 d.114200
13. 9,13.5,27,67.5__
    a.198.5 b.200.5 c.134.5 d.202.5
14. 1,0,5,8,17,24,37,__
    a. 49 b.42 c.48 d.43
15. 1,5,11,49,239__
    a.1441 b.1444 c.1414 d.1244
16. 1,30,136,417,838,__
    a.833 b.764 c.814 d.839
17. 3,4,12,45,196__
    a. 1100 b.1005 c.1005 d.1092
18. 6,9,11.25,22.50,26.50,__
    a.60.25 b.66 c.66.25 d.56
19. 2807,1400,697,346,171,__
    a.80 b.66 c.88 d.84
20. 16,4,2,1.5,1.5,__
    a.3.25 b.1.875 c.1.25 d.1.7

Competition Level (Wrong one out)

1. 1 3 10 36 152 760 4632
   (a) 3 (b) 36 (c) 4632 (d) 760 (e) 152

2. 2, 12, 18, 45, 180, 1170, ?
   (a) 12285 (b) 10530 (c) 11700 (d) 12870 (e) 9945

3. 67, 1091, 835, 899, 883, ?
   (a) 889 (b) 887 (c) 883 (d) 894 (e) 896

4. 12, 30, 120, 460, 1368, 2730
   16 (a) (b) (c) (d) (e)

   What will come in place of (d) ?

   (a) 1384 (b) 2642 (c) 2808 (d) 1988 (e) None of these

5. 72, 74, 84, 110, 160, 244, 364

(a) 364 (b) 244 (c) 160 (d) 74 (e) 72

6. 30, 42, 48, 54, 65, 81, 126
(a) 42 (b) 48 (c) 126 (d) 30 (e) 65

7. 77, 78, 159, 472, 1889, 9446, 56677
(a) 159 (b) 472 (c) 1889 (d) 56677 (e) 77

8. 2159, 1967, 1782, 1611, 1461, 1339, 1254
(a) 1967 (b) 2159 (c) 1461 (d) 1254 (e) 1611

9. 854, 886, 923, 964, 1007, 1054, 1107
(a) 923 (b) 1007 (c) 854 (d) 1054 (e) 1107

10. 465, 633, 775, 897, 993, 1065, 1113
(a) 465 (b) 633 (c) 993 (d) 775 (e) 1113

11. 12, 12, 30, 120, 654, 4620
(a) 12 (b) 654 (c) 30 (d) 120 (e) 4620

12. 1174, 1275, 1445, 1671, 1961, 2323
(a) 1174 (b) 1275 (c) 1671 (d) 1961 (e) 2323

13. 9, 25, 58, 125, 260, 531, 1075
(a) 9 (b) 25 (c) 260 (d) 531 (e) 1075

14. 4, 11, 39, 163, 823, 4947, 34639
(a) 11 (b) 4 (c) 4947 (d) 39 (e) Series is correct

15. 19, 24, 33, 43, 55, 69, 85
(a) 24 (b) 19 (c) 33 (d) 55 (e) 85

16. 36, 34, 22, -8, -64, -154 , -286
(a) 36 (b) 22 (c) -8 (d) -64 (e) Series are correct

17. 3, 8, 17, 36, 73, 146, 297
(a) 3 (b) 17 (c) 297 (d) 146 (e) Series are correct

18. 0, 1, 9, 36, 81, 225, 441
(a) 0 (b) 1 (c) 36 (d) 81 (e) Series are correct

19. 5,9,25,59,125,225,369
(a)59 (b)5 (c)25 (d)225 (e) 369

20. 540,550,575,585,615,620,645
(a)540 (b)585 (c)615 (d)645 (e) 575

Coding Decoding

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

To remember them use the Code- **EJOTY (5, 10, 15, 20, 25)**

A-Z , B-Y …….are opposite to each other. The sum of two opposite letters is 27. A=1 , Z=26 so A+Z=1+26=27.

Number coding

In this, either the numerals are assigned to the alphabets of the given code or the alphabets are assigned to the numerals. The candidate has to observe the direction of solving the problem.

Mixed coding

In this, three or more complete messages are given. The procedure to solve is any two messages bearing the common word are picked up. Proceeding similarly, all possible combinations of two messages are analyzed.

Mixed number coding

It is the same as mixed coding but instead of alphabetical codes numerical codes are given.

Decoding

Conversion of the coded numbers or alphabets to the original text. The procedure to decode is the same as coding. That is, find the pattern that is followed in the given series.

SYMBOLS CODING

In this type of coding, symbols like!, @, # and so on will be used for coding the numbers or alphabets.

Class Practice Problems

1. If COURSE is coded as FRXUVH, how is RACE coded as?
   A. ABHF B.UDFH C.DUHF D.WQYF
2. In a certain code, MONKEY is written as XDJMNL. How is TIGER written in that code?
   A.QDFHS B.FHSQD C.DQSFH D.STFDQ
3. If BOMBAY is written as MYMYMY, how will TAMIL NADU be written in that code?
   A. YMNYMNYMN B.ABHABHABH C.ABCDABCDA D.MNUMNUMNU
4. In a certain code, TOGETHER is written as RQEGRJCT. In the same code, what will PAROLE be written as?
   A.PQJGNC B.CNGJPQ C.NCPQJG D.NCJQPG
5. If in a certain language, COUNSEL is coded as BITIRAK, how is GUIDANCE written in that code?
   A.OHYFZJBB B.OFHBJZYB C.BJZYBHFO D.FOHYZJB
6. If in a certain code, TWENTY is written as 863985 and ELEVEN is written as 323039, how is TWELVE written in that code?
   A.203863 B.368302 C.863203 D.320368
7. In a certain code, if LOGIC is coded as 1512201824, how is PEARL coded as?
   A.112226915 B.113331596 C.112226571 D.113336734
8. If APPLE is written as 24991320, how is LOVELY coded as?
   A.13101310130 B.1310320130 C.13101350140 D.13101340120
9. If ENGLAND is written as 1234526 and FRANCE is written as 785291, how is GREECE coded?
   A.117186 B.381191 C.131871 D.112235

10. If **tee see pee** means **drink fruit juice**, **see kee lee** means **juice is sweet**, **lee ree mee** means **he is intelligent**, then which word means **sweet**?
    A.See B.Pee C.Tee D.Kee
11. If white is called blue, blue is called red, red is called yellow, yellow is called green, green is called black, black is called violet and violet is called orange, what would be the color of human blood?
    A.Blue B.Yellow C.Black D.Violet
12. If the animals which can walk are called swimmers, animals who crawl are called flying, those living in water are

called snakes and those which fly in the sky are called hunters, then what will a lizard be called?
A.Flying B.Swimmer C.Snakes D.Hunters

13. In a certain code language, 'col tip mot' means 'singing is appreciable ', 'mot baj min' means 'dancing is good'and 'tip nop baj' means 'singing and dancing', then, which of the following means 'good' in that code language?
A.Mot B.Bai C.Min D.Nop

14. In a certain code language, '851' means 'good sweet fruit', '783'means 'good red rose' and '341' means'rose and fruit'. Which of the following digits stands for 'sweet' in that language?
A.2 B.3 C.4 D.5

15. In a certain code, **2** is coded as **P**, **3** as **N**, **9** as **Q**, **5** as **R**, **4** as **A** and as **B**. How is **599423** coded in that code?
A.QRQPAN B.RQQAPN C.AQPQRN D.QRANPA

16. In a certain code language, '123' means 'hot filtered coffee', '356'means 'very hot day' and '589' means 'day and night'. Which digit stands for 'very'?
A.3 B.6 C.9 D.7

17. In a certain code, '256' means 'you are good'; '637' means 'we are bad' and '358' means 'good and bad'. Which of the following represents 'and 'in that code?
A.5 B.6 C.7 D.8

18. If in a certain language NZTUJGZ is coded as MYSTIFY, how is OFNFTJT coded in that language?
A.REGULAR B.MORNING C.MINDFUL D.NEMESIS

19. In a certain code, SQHOOKD is written as TRIPPLE. How CHRONRD is written in that code?
A.GLITTER B.TROUSER C.JANUARY D.DISPOSE

20. If HUMJTK is coded as FRIEND, how is EDRIRL written in that code ?
A.SUNDAY B.MONDAY C.BEAUTY D.CANDLE

Tutorial Practice Problems

1. In a certain code language FILES is written as GJMFT , How will SCOUT be written in that code ?
a)TDOPV (b) TDPVU (c) DTPOU (d) TDPOU (e) None of these
2. In a certain code language NUMBER is written as MTLADQ , how will VIOLIN be written in that code?
(a) VHKNHM (b) WJNKMH (c) UHNKHM (d) TDPOU (e) None of these
3. In a certain code language HOUSE is written as GPTTD , how will BROAD be written in that code ?
(a) CQPBE (b) ASNBD (c) ASOBD (d) ASNBC (e) None of these
4. In a certain code language DELHI is written as FGNJK , how will ALWAR be written in that code ?
(a) CNYCT (b) DMXCT (c) CNWCT (d) CNDTY (e) None of these
5. In a certain code language WALK is written as UYJI, how will TRIM be written in that code ?.
(a) RHGK (b) SGHK (c) ROGK (d) PQGK (e) None of these
6. In a code language VICTORY =YLFWRUB than what is the code for FAILURE = ?
(a) JELOZUH (b) IDLOXUH (c) JDLKWUH (d) IDOLKUH (e) None of these
7. In a code language COULD = BNTKC and MARGIN=LZQFHM than what is the code for MOULDING=?
(a) LNTKCHMF (b) CNMFINTK (c) LNKTCHMF (d) NITKCHMP (e) None of these
8. In a code language SAND =VDQG and BIRD=ELUG than what is the code for LOVE= ?
(a) PRYG (b) ORTG (c) NPUH (d) ORYH (e) None of these
9. In a code language SATELLITE=FUBTLDSHK than what is the code for LAUNCHING=?
(a) OVBCFMHGI (b) BVCRTOMPU(c) OVBMCFMHG (d) VBUMCINGP
10. In a system of coding ACCESS is coded CEEGUU, PONTIFF as HHKPORV, LIMERICK as EGKKMNOT and LAMINATE as CCGKNOPV. what is likely to be the word of which the code is COTUV?
a)TRAPS b)PARTS c)SMART d) none of these
11. In a certain code language,
(A) 'pit na som' means 'bring me water'
(B) 'na jo tod' means 'water is life'
(C) 'tub od pit' means 'give me toy'
(D) 'jo lin kot' means 'life and death'
Which of the following represents 'is' in that language ?
A) jo B) na C) tod D) lin
12. If ROSE is coded as 6821, CHAIR is coded as 73456 and PREACH is coded as 961473, what will be the code for SEARCH ?
A) 246173 B) 214673 C) 214763 D) 216473
13. In a certain code language, '3a, 2b, 7c' means 'Truth is Eternal';
'7c, 9a, 8b, 3a' means 'Enmity is not Eternal' and
'9a, 4d, 2b, 8b' means 'Truth does not perish'.
Which of the following means 'enmity' in that language ?
A) 3a B) 7c C) 8b D) 9a
14. In a certain code language,
(A) 'pit dar na' means 'you are good'
(B) 'dar tok pa' means 'good and bad'

(C) 'tim na tok' means 'they are bad'
In that language, which word stands for 'they' ?
A) na B) tok C) tim D) pit

15. In a certain code language TUTDNES is written as STUDENT. How will SUORECS be written in that codelanguage?
a. BATTERY B.FASHION C.SOURCES D.LIMITED
16. ZA5, Y4B, XC6, W3D,
A. E7V B.V2E C.VE5 D.VE7
17. In a certain code 'TOME' is written as '@ $ * ?' and ARE is written as ' • £ ? ' How can 'REMOTE' be writtenin that code?
a) ?*$@? £ B. *$@? £? C. £?*$@? D. *$? £@?
18. In a certain code 'PALM' is coded as '!@?$' and 'ARM' is written as '@*$', how can 'ALARM' be written in that code?
A.@!@?$ B. @$?!@ C. ?@@!$ D.NONE OF THESE
19. If Pour is wrtten as 4156
Sware is written as 78269
Clear is written as 3@926
Then what is the code for PEARL= ?
A) 429@6 B) 4962@ C) 4692@ D) 4926@
20. In a certain code language, 'dom put ta' means 'bring hot food';
'put tir sop' means 'food is good' and
'tak da sop' means 'good bright boy'.
Which of the following does mean 'hot' in that language ?
A) dom B) pul C) ta D) Can't be determined

ALPHABET TEST

Class Practice Problems

1. Arrange the given words Alphabetical Order and choose the one that comes first.
(A) Wasp (B) Waste (C) War (D) Wrinkle (E) Wrist
2. Arrange the given words Alphabetical Order and choose the one that comes first
(A) Science (B) Scrutiny (C) Scripture (D) Scramble (E) Script
3. Arrange the given words Alphabetical Order and choose the one that comes first.
(A) Intense (B) Intellect (C) Intend (D) Intelligent (E) Integument
4. Arrange the given words Alphabetical Order and choose the one that comes first.
(A) Nature (B) Native (C) Narrate (D) Nascent (E) Naughty
5. Arrange the given words Alphabetical Order and choose the one that comes first.
(A) Didactic (B) Dictum (C) Dictionary (D) Diastole (E) Dictate
6. Arrange the given words Alphabetical Order and choose the one that comes first.
(A) Praise (B) Practical (C) Prank (D) Prayer (E) Practices
7. Arrange the given words Alphabetical Order and choose the one that comes first.
(A) Animate (B) Animosity (C) Anguish (D) Ankle (E) Announce
8. Arrange the given words Alphabetical Order and choose the one that comes first.
(A) Probe (B) Proclaim (C) Proceed (D) Problem (E) Probate
9. Arrange the given words Alphabetical Order and choose the one that comes first.
(A) Signature (B) Sight (C) Shrine (D) Shrill (E) Shrink
10. How many pairs of letters in the word 'CHAIRS' have as many letters between them in the word as in the alphabet?
(A) 2 (B) 3 (C) 1 (D) 4
11. How many pairs of letters are there in the word " CASTRAPHONE" which have as many letters between them in the word as in the alphabet?
(A)4 (B)5 (C)6 (D)1
12. A B C D E F G H I J K L M N O P Q R S T U V W X Y Z .
Which letter in this series is the eighth letter to the right of the letter which is tenth letter to the left of the last but one letter of the series?
(A) A (B) X (C) C (D)W
13. How many meaningful English words can be formed with the letters ESRO using each letter only once in each word?
(A) NONE (B) 1 (C) 3 (D) 2
14. If in the word 'DISTURBANCE', the first letter is interchanged with the last letter, the second letter is interchanged with the tenth letter and so on, which letter would come after the letter T in the newly formed word ?
(A) S (B) I (C) N (D)T
15. If the first and second letters in the word DEPRESSION' were interchanged, also the third and the fourth letters, the fifth and the sixth letters and so on, which of the following would be the seventh letter from the right ?
(A) R (B)P (C)D (D)S
16. What should come next in the following letter sequence?
A A B A B C A B C D A B C D E A B C D
(A)A (B)E (C)C (D)B
17. If the first half of the English alphabet is reversed and then next portion of English alphabet is reversed so as 'A' takes the portion of 'M' and 'N' takes the portion of 'z' then which letter will be 6th to the left of 17th letter to the right of 7th letter from

the left?
(A) U (B) V (C) C (D) D

18. From the word 'LAPAROSCOPY' how many independent meaningful words can be made without changing the order of the letters and using each letter only once ?
(A) 3 (B)4 (C)2 (D)1
19. From the word 'ASTOUNDER', how many independent words can be made with-out changing the order of the letters and using each letter only once ?
(A)1 (B)2 (C)3 (D)4

20. Arrange these words in alphabetical order and tick the one that comes last
1.Abandon 2. Actuate 3. Accumulate 4. Acquit 5. Achieve
(A) Actuate (B) Abandon (C) Accumulate (D) Achieve

TUTORIAL PRACTICE PROBLEMS

1. If the first and second letters in the word 'MISFORTUNE' were interchanged, also the third and the fourth letters, the fifth and the sixth letters and so on, which letter would then be the eighth letter counting to your left ?
(A) O (B) F (C) T (D) I
2. How many independent words can 'HEARTLESS' be divided into without changing the order of the letters and using each letter only once ?
(A) 2 (B) 3 (C) 4 (D) 5
3. Arrange the following words will come in middle if all of them are arranged alphabetically as in a dictionary?
(A)SAVE (B) SAVIOUR (C) SAVAGE (D) SAVOUR
4. How many meaningful English words can be made from the letters EOPR using each letter only once?
(A) NONE (B) 1 (C) 2 (D) 3
5. If the sequence of the English alphabet is reversed then which letter is 7th to the left of second vowel from the right of English alphabet in the new series?
(A) U (B) V (C) L (D) M
6. Q 2 3 B 9 V 5 L S R F P012
If one is subtracted from each of the numbers, which of the following will be the fourth to the right of the thirteenth from the right ?
(A)4 (B) 8 (C) 2 (D) 1
7. If the positions of the third and tenth letters of the word 'DOCUMENTATION' are interchanged, and likewise the position of the fourth and seventh letters, the second and sixth letters, is also interchanged, which of the following will be eleventh letter from the right end ?
(A) U (B) C (C) T (D)I
8. How many letters are there in the word 'CREATIVE' which have as many letters between them in the word as in the alphabet ?
(A) 1 (B) 2 (C) 3 (D) 4
9. If the last four letters of the word 'CONCENTRATION' are written in reverse order followed by next two in the reverse order and next three in the reverse order and then followed by the first four in the reverse order, counting from the end, which letter would be eighth in the new arrangement ?
(A) E (B) N (C) R (D) T
10. If the position of the first letter of English alphabet is interchanged with the position of the fourteenth letter, second letter with fifteenth letter, and so on, in such a way that M is interchanged with Z, then which of the following letters will be 7th to the right of 13th letter from the right?
(A) U (B) G (C) H (D) I
11. LAP BUT CAR SON HID If the positions of the first and the third alphabets of each of the words are interchanged, which of the following would form a meaningful word in the new arrangement?
(A)HID (B) SON (C) LAP (D) BOTH LAP AND BUT
12. Of the six members of a panel sitting in a row X is to left of Q but on the right of P. Y is in the right of Q but is on the left of Z, Z is to the left of R. Find the members who are at the extreme?
(A) QZ (B)PR (C) XY (D) AZ
13. C U B A E D E D A B E B A U C D B C A D B D U B C A C B E D A
If all the A's are dropped from the above arrangement, which of the following will be eleventh from the left end of the above arrangement?
(A)E (B) D (C) C (D)U
14. If it is possible to form a word with the first , fourth, seventh and eleventh letters in the word "SUPERFLUOUS" write the first letter of that word other wise x is the answer
(A) S (B) L (C) E (D) X
15. If it is possible to make a meaningful word from the third, fifth, sixth, eighth and tenth letters of the word PAROCHIALISM using each letter only once, third letter of the word would be your answer. If more than one such word can be formed, your answer would be 'y' and if no such word can be formed, answer is 'G'.
(A) Y (B) G (C) A (D) X
16. In the following Color sequence, R stands for Red, Y for Yellow , G for Green, B for Blue and W for white of the sequence is continued, which color will come next?

B B R B R W B R W G B R W G Y B R B R W B R W
(A)White (B)Yellow (C)Red (D)Green

17. How many pairs of letter are there in the word 'BUCKET' which have as many letters between them in the word as in the alphabet ?
(A)1 (B)3 (C) more than 3 (D) 2
18. If the positions of the fifth and twelfth letters of the word 'GLORIFICATIONS' are interchanged; and likewise the position of the fourth and fourteenth letters, the third and tenth letters, the second and eleventh letters and the first and thirteenth letters are interchanged, which of the following will be twelfth letter from the right end ?
(A) O (B)T (C) I (D) R
19. How many pairs of letters are there in the word 'SEQUENTIAL' which have as many letters between them as are in the alphabet ?
(A) 1 (B) 2 (C) 3 (D) 4
20. Select the combination of numbers so that the letters are arranged accordingly in the form of meaningful word.
T L P N A E
12 3 4 5 6
(A)3,2,5,4,1,6 (B)3,2,5,4,6,1 (C) 4,5,3,6,2,1 (D) 4,6,1,3,5,2

INTEREST

SIMPLE INTEREST

If the interest on a sum borrowed for certain period is calculated uniformly, it is called **simple interest (SI).**Simple interest is a quick method of calculating the interest charge on a loan.

Principal: The amount borrowed or invested.

Loan period or duration: Is the time that the principal amount is either borrowed or invested. It is usually given in years, but in some cases, it may be quoted in months or even days.

Interest: Is the extra money paid by the borrower to the owner (lender) as a form of compensation for the use of the money borrowed.

The statement **"rate of interest 10% per annum"** means that the interest for one year on a sum of **Rs.100** is

Rs.10. If not stated explicitly, rate of interest is assumed to be for one year.

Formula

SIMPLE INTEREST **=** $\frac{\text{PRINCIPAL*RATE OF INTEREST*TIME}}{\mathbf{100}}$

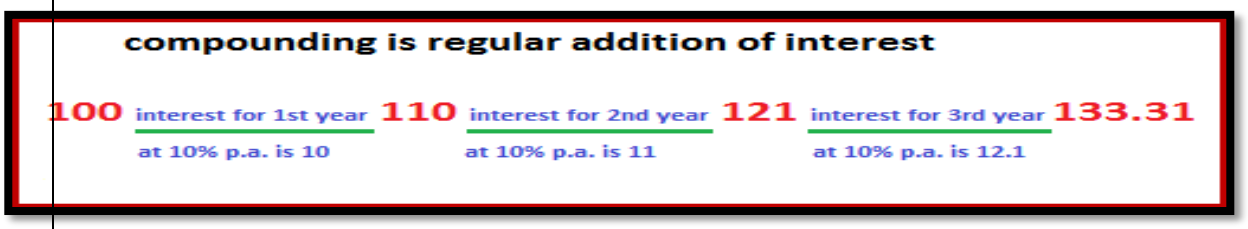
Example: Calculate the simple interest on Rs. 1000 at the rate of 5% per annum for a time period of 2 years.
Solution: Principal=1000

Rate of interest=5% p.a.Time= 2 years
SIMPLE INTEREST= $\frac{P*R*T}{100} = \frac{1000*5*2}{100} = Rs.100$

COMPOUND INTEREST

Compound Interest is the interest calculated on a sum of money which includes principal and interest calculated forthe previous year.

Example: Calculate the interest if compounded annually for an amount of Rs. 100 for a time period of 3 years at therate of 10 % per annum.
Solution: Here, Principal =Rs. 100Time Period=3 years
Rate of interest =10% per annum



Amount 110 is the principal for the 2nd year, amount 121 is the principal for the 3rd year, and amount 133.1 is theprincipal for the 4th year.
Under compound interest, Amount is found by the formula given below:

Time (in years)	Amount	Interest
1	P(1 + R/100)	$\frac{PR}{100}$
2	$P(1+\frac{R}{100})^2$	$P(1+\frac{R}{100})^2 - P$
3	$P(1+\frac{R}{100})^3$	$P(1+\frac{R}{100})^3 - P$
4	$P(1+\frac{R}{100})^4$	$P(1+\frac{R}{100})^4 - P$
n	$P(1+\frac{R}{100})^n$	$P(1+\frac{R}{100})^n - P$

Class Practice Problems

Type 1 – Simple Interest

1. A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 945 in 5 years. The sum is?
   A. 650 B. 690 C. 620 D. 700
2. How much time will it take for an amount of Rs. 450 to yield Rs. 81 as interest at 4.5% per annum of simpleinterest?
   A. 3.5 years B. 4 years C. 4.5 years D. 5 years
3. A sum of Rs. 12,500 amounts to Rs. 15,500 in 4 years at the rate of simple interest. What is the rate of interest?
   A. 3% B. 4% C. 5% D. 6%
4. What will be the ratio of simple interest earned by certain amount at the same rate of interest for 6 years andthat for 9 years?
   A. 1: 3 B. 1: 4 C. 2: 3 D. Data inadequate
5. A person borrows Rs. 5000 for 2 years at 4% p.a. simple interest. He immediately lends it to another person at6 ¼% per annum for 2 years. Find his gain in the transaction per year?
   A. Rs. 112.50 B. Rs. 125 C. Rs. 150 D. Rs. 167.50
6. A father left a will of Rs.35 lakhs between his two daughters aged 8.5 and 16 such that they may get equal amounts when each of them reach the age of 21 years. The original amount of Rs.35 lakhs has been instructed tobe invested at 10% p.a. simple interest. How much did the elder daughter get at the time of the will?
   A. 17.5 lakhs B. 21 lakhs C. 15 lakhs D. 20 lakhs
7. At what rate percent per annum will a sum of money double in 8 years?
   A. 12.5% B. 13.5% C. 11.5% D. 14.5%
8. A sum of Rs. 725 is lent in the beginning of a year at a certain rate of interest. After 8 months, a sum of Rs.362.50 more is lent but at the rate twice the former. At the end of the year, Rs. 33.50 is earned as interest fromboth the loans. What was the original rate of interest?
   A. 3.46% B. 5% C. 4.5% D. 6%

Type 2 – Compound Interest

9. The compound interest on Rs. 30,000 at 7% per annum is Rs. 4347.The period (in years) is?
   A. 2 B. 2.5 C. 3 D. 4
10. The Compound interest on Rs. 20,480 at 6 1⁄4 % per annum for 2 years 73 days is?
    A. Rs. 2929 B. Rs. 2219 C. Rs. 3021 D. Rs. 3049
11. A man invests Rs.5000 for 3 years at 5% p.a. compound interest reckoned yearly. Income tax at the rate of 20% on the interest earned is deducted at the end of each year. Find the amount at the end of the third year?
    A. Rs. 5624.32 B. Rs. 5423 C. Rs. 5634 D. Rs. 5976
12. The population of a town was 3600 three years back. It is 4800 right now. What will be the population threeyears down the line, if the rate of growth of population has been constant over the years and has been compounding annually?
    A. Rs. 600 B. Rs. 6400 C. Rs. 6500 D. Rs. 6600
13. A tree increases annually by 1⁄5 th of its height. If its height today is 50 cm, what will be the height after 2years?
    A. 64 cm B. 72 cm C. 66 cm D. 84 cm
14. The compound interest on Rs. 30,000 at 7% per annum is Rs. 4347. The period (in years) is?
    A. 1 B. 2 C. 3 D. 3.5
15. A sum amounts to Rs. 882 in 2 years at 5% compound interest. The sum is?
    A. Rs. 800 B. Rs. 822 C. Rs. 840 D. Rs. 816
16. What annual payment will discharge a debt of Rs. 1025 due in 2 years at the rate of 5% compound interest?
    A. Rs. 560 B. Rs. 560.75 C. Rs. 551.25 D. Rs. 550
17. The present worth of Rs. 242 due in 2 years at 10% per annum compound interest is?
    A. Rs. 180 B. Rs. 240 C. Rs. 220 D. Rs. 200
18. If in a certain number of years Rs. 10000 amounts to Rs. 160000 at compound interest, in half that time Rs. 10000 will amount to?
    A. Rs. 50000 B. Rs. 40000 C. Rs. 80000 D. Rs. 60000
19. The compound interest on Rs. 30,000 at 7% per annum is Rs. 4347. The period (in years) is?
    A. 1 B. 2 C. 3 D. 3.5

Tutorial Practice Problems:

1. A sum of Rs. 500 amounts to Rs. 650 in 3 years at simple interest. If the interest rate is increased by 4%, it would amount to how much for the same time period?
   a) Rs. 910 b) Rs. 810 c) Rs. 710 d) Rs. 610
2. Simple interest on a sum of Rs. 1550 for 2 years is Rs. 60 more than the simple interest on Rs. 1450 for the same duration and at the same interest. Find the rate of interest.
   a) 15% b) 30% c) 10% d) 20%
3. A sum of money invested for 5 years at $7\frac{1}{2}$% per annum yield Rs. 180000 simple interest. What is the total amount received at the end of 5 years?
   a) Rs. 400000 b) Rs. 480000 c) Rs. 540000 d) Rs. 660000
4. Rs. 800 becomes Rs. 956 in 3 years at certain rate of simple interest. If the rate of interest is increased by 4%, what amount will Rs. 800 become in 3 years?
   a) Rs. 1020. 8 b) Rs. 1025 c) Rs. 1052 d) data inadequate
5. A certain sum at a certain rate of simple interest amounts to Rs. 2250 in 4 years and Rs. 2400 in 7 years. Find the sum and rate of interest.
   a) Rs. 3050, 3.52% b) Rs. 5020, 2.43% c) Rs. 2050, 2.43% d) Rs. 3050, 2.85%
6. Rs. 20000 is being compounded at 20% per annum. If the rate of interest is charged half yearly. What will be the amount after 2 years?
   a) Rs. 28292 b) RS. 27292 c) Rs. 29282 d) Rs. 22358
7. The compound interest earned on a sum in 3 years at 15% per annum compounded annually is Rs. 6500.52. What is the sum?
   a) Rs. 2480 b) Rs. 10500 c) Rs. 14800 d) none of these

8. Sudharshan invested Rs. 15000 at compound interest at the rate of 10% per annum for one year. If the interest is compounded every six months what amount will Sudharshan get at the end of the year?
   a) Rs. 16537.50 b) Rs. 16500 c) Rs. 16525.50 d) Rs. 18150
9. The compound interest earned by Suresh on a certain amount at the end of two years at the rate of 8% per annum was Rs. 1414.4. What was the total amount that Suresh got back at the end of two years in the form of principal plus interest earned?
   a) Rs. 9414.4 b) Rs. 9914.4 c) Rs. 9014.4 d) Rs. 8914.4
10. How much will Rs. 20000 amount to (approximately) in 2 years at the rate of 15% per annum, the interest being compounded semi-annually?
   a) Rs. 27809 b) Rs. 27609 c) Rs. 26709 d) Rs. 28709
11. What will be the compound interest on a sum of Rs. 3000 at 10% per annum for 3/2 years (if interest compounded half yearly)
   a) Rs. 473 b) Rs. 374 c) Rs. 495 d) Rs. 347
12. The compound interest on Rs 8000 for 3 years at 8% for first year, 10% for second year and 12% for third year will be:
   a) Rs. 2722.24 b) Rs. 2644.48 c) Rs. 2836.18 d) Rs. 2684.12
13. If the compound interest on a sum of Rs. 5000 at the rate of 10% per annum is Rs. 1050, then what is the time period (interest compounded yearly)?
   a) 1 year b) 21/2 years c) 3 years d) 2 years
14. Rs. 12000 amounts to Rs. 20736 in 3 years at r% per annum of compound interest, find the value of 'r'?
   a) 10% b) 25% c) 12% d) 20%
15. A sum of Rs. 400 would become Rs. 441 after 2 years at r% compound interest; find the value of 'r'?
   a) 15% b) 5% c) 10% d) 20%
16. The effective annual rate of interest corresponding to a nominal rate of 8% per annum payable half yearly is:
   a) 8% b) 8.01% c) 8.13% d) 8.16%
17. A sum of money doubles in 3 years at r% compound interest. In 9 years it will be k times of the original principal. What is the value of k?
   a) 10 b) 9 c) 6 d) 8
18. Find the difference between the simple interest and compound interest on a principal of Rs. 5000 at the rate of 15% per annum for two years.
   a) Rs. 112.5 b) Rs. 115 c) Rs. 105 d) Rs. 120
19. What will be the difference between the simple interest accrued on a sum of Rs. 4500 at 12% per annum for 2 years and that on a sum of Rs. 5600 at 9% per annum for 2 years?
   a) Rs. 75 b) Rs. 72 c) Rs. 69 d) Rs. 76
20. The simple interest accrued on an amount of Rs. 20000 at the end of three years is Rs. 7200. What would be the compound interest accrued on the same amount at the same rate in the same period?
   a) Rs. 8342.36 b) RS. 8098.56 c) Rs. 8246.16 d) Rs. 8112.86

Competition Level

1. A man deposited Rs.1850 in a bank at 7% per annum and Rs.2150 in another bank at 9% per annum. Find the rate of interest for the whole sum:
   a)8.133% b)8.075% c)8.25% d)8.375%

2. Rs. 9600 is invested in two parts, one part at rate of 11% per annum and remaining part at 15% simple interest. If the simple interest received after four years is Rs.5088. Then find the difference between both parts?
   a) Rs.1200 b) Rs.1000 c)Rs.1600 d)Rs.800

3. A man borrowed a total amount of Rs.45000, one part of it at rate of 10%per annum simple interest and

remaining part on 12% per annum. If at the end of three years, he paid in all Rs.59940. To settle the loan amount. What was the amount borrowed at 12% per annum?
a)Rs.21000 b)Rs.18000 c)Rs.24000 d)Rs.27000

4. A person invested a sum of Rs. 90000 in 3 Schemes A, B & C at the rate of 16%, 19% & 31% per annum respectively. The amount invested in scheme C is 50% more than the amount invested in scheme A. Find the total amount invested in scheme B, if he gets a total amount of Rs.150300 in three years.
a)30000 b)40000 c)50000 d)35000

5. The rate of simple interest for first 3 years is 8%, for next 4 years it is 8.5% and the period beyond 7 years it is 7.5% per annum. If the total simple interest at the end of 13 years is Rs.9270. Find the initial investment.
a)Rs.8100 b)Rs.9600 c)Rs.9000 d)Rs.10000

6. The rate of S.I. on a certain sum of money is 6.5% per annum for first four years, 9% per annum for next 7 years, and 10% per annum for the period beyond 11 years. If the Amount received at at the end of 19 years is Rs.43040. Find the sum.
a)14000 b)16000` c)20000 d)18000

7. A person deposited certain money at the starting of each year, if rate of interest is 13% per annum. At the end of 3rd year, the total amount is Rs.24948. Then find how much money he deposited each year.
a)Rs.6400 b)Rs.6600 c)Rs.6200 d)Rs.6300

8. A person invested five-twelvth of total principal at 9% per annum, 2/9 part at 11% per annum and remaining part at 16% per annum simple interest. If the total simple interest in one year is Rs.38790. Find the total investment.
a)Rs.324000 b)Rs.288000 c)Rs.360000 d)Rs.252000

9. If a man receives on 1/4th of his capital 7.2% simple interest, 5.3% of the remaining 2/5th capital and on the remaining capital 5.8%. The total amount received by man after three years is Rs.82600. Then find total principal?
a)Rs.65000 b)Rs.60000 c)Rs.72000 d)Rs.70000

10. A person deposited some money in bank. Bank gives 6(2/3)% per annum simple interest. After 4 years he withdraws Rs.2550. Bank gives 12.5% per annum simple interest on remaining amount. At the end of fifth year, total amount is Rs.15300. Find the initial investment.
(a)Rs.12750 (b)Rs.15750 (c) Rs.11250 (d)Rs.12000

11. A person deposited some money in a scheme. Scheme gives 6.25% per annum simple interest. After 5 years he invests Rs. 1650 more. After that he receives 9(1/11)% per annum simple interest for three years, now he withdraws rupees Rs.800 from his amount and on remaining amount Scheme gives 5% simple interest for next two years. At the end of tenth year, he received total amount of Rs.17600. Find the initial investment.
a)Rs.8800 b)Rs.8400 c)Rs.8000 d)Rs.10400

12. A person borrowed a sum at 18% per annum and return Rs. 13800 after 1 year. Now the rate of becomes 15% per annum on rest of the amount. If the interest of the 2nd year is 19/32 of the 1st year. Find the amount borrowed?
a)Rs.52000 b)Rs. 60000 c)Rs. 48000 d)Rs.44000

13. A certain sum of money is invested in two parts in such a way that the S.I. from first part at rate of 16% per annum for 18 years is equal to the simple interest on second part at the rate of 22% per annum for 15 yrars. Find the sum of money, if difference between both investments is Rs.4200.
a)56650 b)67800 c)72100 d)61800

14. Rs.11400 is invested in three parts in such a way that the rate of interest is 4%, 5 (1/4)% & 7(1/2)% per annum for 12years, 10 years and 8 year respectively. If simple interest on each part is equal. Find the difference between maximum and minimum invested parts?
a)Rs.840 b)Rs.360 c)Rs.460 d)Rs.920

15. A sum of Rs. 7,930 is divided into three parts and given on loan at 5% simple interest to A. B and C for 2, 3 and 4 years respectively. If the amounts of all three are equal after their respective periods of loan, then A received a loan of
(a) Rs. 3,050 (b) Rs. 2,760 (c) Rs. 2,750 (d) Rs. 2,800

16. Rs. 18210 is invested in three Schemes-A, B and C for 5 years, 8 years and 4 years respectively. If these three Schemes give a simple interest of 12%, 10% and 12.5% respectively. After completion of each scheme a person gets amount in the ratio 3:7:4 from these schemes. Then find the sum of money invested in Scheme C?
a)Rs.4320 b)Rs.5760 b)Rs.5880 c)Rs.5120

17. A certain sum of money becomes 2.25 times of itself in 2 years. Then find the rate of interest if compounded annually.
a)25% b)50% c)15% d)75%

18. A certain sum of money becomes 512/162 times of itself in 4 years. Then find the rate of interest if compounded annually.
a)33.33% b)22.22% c)25% d)27.5%

19. If the amount received at the end of 2nd and 3rd year at compound interest on a certain Principal is Rs. 9,600 and Rs.10,272 respectively, what is the rate of interest (in %)?
(a) 7 (b) 8 (c) 6 (d)5

20. A certain sum of money becomes Rs.54000 in 4 years and it becomes Rs.59582 in 7 years. Find the rate of interest, if compounded annually.
a)5% b)3% c)3(1/3)% d)6(2/3)%

21. A sum of money becomes 13.824 times of itself in 30 years then in how many years it was 2.4 times of itself?
(a)15 years (b)10 years (c)20 years (d)5 years

22. A sum of money becomes Rs.625 in 2019 when Rs.1 was given on compound interest in 1939. What was its worth in 1999?
a) Rs.312.5 b) Rs.225 c) Rs.125 d) Rs.500

23. If a sum of money Rs.48600 becomes Rs.115200 in 4.5 years. Then in 7.5 years it will become how much if it is given at compound interest annually?
a)Rs.159600 b)Rs.204800 c)Rs.230400 d)Rs.172800

24. An investor invested his saving in the stock market. The value of his investments increased 12% and 9% in the first year and the second year respectively. If the value of his investments after two years became Rs 97,664 then how much had he invested (in Rs)?
(a) 81000 (b) 75000 (c) 80000 (d) 72000

25. Compound interest on a certain sum for 1 year at 14% per annum compounded half yearly is Rs.289.8. the simple interest at the same rate of interest for one year would be
a)Rs.140 b)Rs.300 c)Rs.280 d)Rs.299

26. A sum of money becomes Rs.64800 at compound interest. If rate of interest in three years is 12.5%, 6(2/3)% and 9.09%respectively. Find the C.I.
a) Rs.14700 b) Rs.16300 c) Rs.13500 d) Rs.15300

27. P=146000, Rate=10% per annum compounded annually and Time = 2 years 25 days. Find amount.
a)Rs.177870 b)Rs.142286 c)Rs.152280 c)Rs.163460

28. Giri invested Rs.10000 at rate of interest 20% per annum. The interest was compounded yearly for the first two years and in the third year it was compounded half yearly. What will be the total interest earned at the end of the third year?
a) Rs.7224 b)Rs.7324 c)Rs.7424 d)Rs.7524

29. P=6750, Rate=6(2/3)% per annum compounded annually and Time = 2 years. Find difference between C.I and S.I.
a)Rs.32 b)Rs.30 c)Rs.27 d)Rs.45

30. Find the difference between C.I and S.I. for three years. If the principal is 15625 and rate of interest compounded annually is 12%.
a) Rs.640 b) Rs.702 c) Rs.720 d) Rs.625

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 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

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 "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

PUZZLE TEST

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

INEQUALITIES

S.NO	SYMBOL	MEANING
1.	>	First element is Greater than the Second element.
2.	<	First element is Smaller than the Second element.
3.	=	First element is Equal to the Second element.
4.	≥	First element is Greater than or Equal to the Second element.
5.	≤	First element is Smaller than or Equal to the Second element.
6.	≠	First element is either greater than or smaller than the Second element.

Class Assignment

Directions (1-10): In these questions, relationship between different elements is show in the statements. The **Statements** are followed by conclusions. Study the conclusions based on the given **Statements** and select theappropriate answer from the given options:

A] If only conclusion I follows. B] If only conclusion II follows.
C] If either conclusion I or II follows D] If neither conclusion I nor II follows.E] If both conclusions I and II follow.

1. **Statements:** Q>H≤D≥G>S=B≤L=I<Z
   Conclusion: I: S<Z II: D≥B

2. **Statements:** H=B≤C≤N>M=X≥P=L>D
   Conclusion: I: H<N II: M≥ L

3. **Statements:** C>B<O<P=L>H=M≥S>X
   Conclusion: I: O>S II: S≤O

4. **Statements:** X>T<Y<B≥C>M=O≥P>Q
   Conclusion: I: T<C II: Q<M

5. **Statements:** S>W=N≤X≤K=J>C≥V
   Conclusion: I: W=K II: W<J

6. **Statements:** A ≥ B ≥ C ≤ D; E ≥ F ≥ G = A
   Conclusions: I. F > D II. B ≥ F

7. **Statements:** E ≥ G ≠ H ≥ F; I ≥ H ≥ J
   Conclusions: I. G < H II. H < G

8. **Statements:** V ≥ U = T; Q = R ≤ S ≥ V
   Conclusions: I. V < Q II. U ≤ R

9. **Statements:** P ≠ Q = R ≥ S ≥ T; U < V ≤ W < X
   Conclusions: I. T < X II. P > Q

10. **Statements:** F ≥ G < E; G > D ≥ C; D ≥ A < B

Conclusions: I. F > C II. F ≥ A

Directions (11-13): In these questions, relationship between different elements is show in the statements. The **Statements** are followed by conclusions. Study the conclusions based on the given **Statements** and select the appropriate answer from the given options:

A] If only conclusion I follows.
B] If only conclusion II follows.
C] If either conclusion I or II follows
D] If neither conclusion I nor II follows.

E] If both conclusions I and II follow.

11. **Statements:** A > E ≥ T ≥ Y; E ≤ W < R; W ≥ Z > B
Conclusions: I. R < B II. T = B

12. **Statements:** A ≥ D ≤ Z; P ≤ D; R > Q = D
Conclusions: I. R > A II. P ≤ Z

13. **Statements:** C > B > L, Q = E > P = C
Conclusions: I. Q > B II. L < E

14. **Statements:** S > A = N > D; A > L > E; M < L < O
Conclusions: I. S > E II. A < O

A] Both conclusions I and II follows B] Only conclusion II follows
C] Only conclusion I follows D] Either conclusion I or II followsE]
Neither conclusion I nor II follows

15. **Statements:** W < Q > R; R = T; T < S
Conclusions: I. Q < T II. S > W

A] Only conclusions I follows B] Only conclusions II follows
C] Either conclusions I or II follows D] Neither conclusions I nor II followsE]
Both conclusions I and II follows

Directions (16-21): In these questions # , ?, $ and % is used with different meaning as follows:'A @ B' means 'A is smaller than B'.
'A # B' means 'A is either smaller than or equal to B'.
„A ? B „ means 'A is equal to B'. 'A $ B' means 'A is greater than B'.
'A % Q' means 'A is either greater than or equal to B'.
In each of the following questions assuming the given Statements to be follows, find which of the two conclusions Iand II given below them is/are definitely follows and select the answer from the given options:

A] Only conclusion I follows B] Only conclusion II follows
C] Either conclusion I or conclusion II follows D] Neither conclusion I nor II followsE]
Both conclusions I and II follows

16. **Statements:** Q ? H @ L @ F
Conclusions: I. Q @ F II. H @ F

17. **Statements:** D $ E, E % I, I % K
Conclusions: I. D % I II. E % K

18. **Statements:** V @ W, W # U, U @ R
Conclusions: I. V @ R II. W @ R

19. **Statements:** F @ J, J # T, T % R

Conclusions:

20. **Statements:** M $ K, K ? H, H % L
Conclusions: I. M $ L II. M @ H

21. **Statements:** P > T > G, S > T = N
Conclusions: I. N >G II. S > P

Home Assignment

Directions (22-31): In these questions, relationship between different elements is show in the statements. The **Statements** are followed by conclusions. Study the conclusions based on the given **Statements** and select the appropriate answer from the given options:

A] Only conclusion I follows B] Only conclusion II follows
C] Either conclusion I or II follows D] Neither conclusion I nor II follows E]
Both conclusions I and II follow

22. **Statements:** H = I ≤ R; M ≥ R<S
Conclusions: I. M=I II. M > I

23. **Statements:** $D > H \geq N$; $S > I \leq H$
Conclusions: I. $N \leq S$ II. $N < D$

24. **Statements:** $P \leq O < I$; $P > Y > W$
Conclusions: I. $Y \leq I$ II. $O > W$

25. **Statements:** $A < J = N$; $H \geq Y \geq I > S = N$
Conclusions: I. $S = J$ II. $S > J$

26. **Statements:** T ≥ J ≥ F; U < J ≥ H= S
Conclusions: I. S > F II. T ≥ H

27. **Statements:** Y ≥ U ≥ H = Q; R ≥ U = M
Conclusions: I. M > Q II. M = Q

28. **Statements** A < J = N; H ≥ Y ≥ I > S = N
Conclusions: I. S = J II. S > J

29. **Statements:** T ≥ J ≥ F; U < J ≥ H= S
Conclusions: I. S > F II. T ≥ H

30. **Statements:** Y ≥ U ≥ H = Q; R ≥ U = M
Conclusions: I. M > Q II. M = Q

31. **Statements:** L ≤ F = G < W; H < S ≤ L
Conclusions: I. S ≤ G II. W > H

32. **Statement**: P < Q < R < S ≥ T = F ≥ Z ≥ H > U
Conclusion: I. S > Z II. S = Z

A] Both conclusions I and II follow B] Either conclusion I or II followsC]
Only conclusion I follows D] Only conclusion II follows
E] Neither conclusion I nor II follows

Direction (33-38): In the following questions, the symbol @, ©, $, % and ∗ are uses with the following meaning asillustrated below.

„P © Q" means „P is not smaller than Q"
„P % Q" means „P is not greater than Q"
„P*Q" means „P is neither smaller than nor equal to Q"
„P@ Q" means „P is neither greater than nor smallerthan Q"
„P $ Q" means „P is neither greater than nor equal to Q".

Now in each of the following questions assuming the given Statements to be follows, find which of the conclusions I,II and III given below then is/ are definitely follows?

33. **Statements:** F % T, T @ J, J * W
Conclusions: I. J @ F II. J * F III. W $ T
A] Only I is follows B] Only II is follows
C] Only III is follows D] Only either I or II is followsE]
Only either I or II and III are follows

34. **Statements:** R * D, D © K, K $ M
Conclusions: I. M * R II. K $ R III. D * MA] None is follows
B] Only I is follows
C] Only II is follows D] Only III is followsE]
Only II and III are follows

35. **Statements:** Z © F, F $ M, M % K
Conclusions: I. K * F II. Z * M III. K * ZA] Only I is follows
B] Only II is follows
C] Only III is follows D] Only II and III are followsE]
None of the above

36. **Statements:** H @ B, B © R, A $ R
Conclusions: I. B * A II. R % H III. A $ H A] Only I and II are follows
B] Only I and III are follows
C] Only II and III are follows D] All I, II and III are followsE]
None of above

37. **Statements:** M $ J, J * T, K © T
Conclusions: I. K * J II. M $ T III. M $ KA] None is follows
B] Only I is follows
C] Only II is follows D] Only III is followsE]
Only II and III are follows

38. **Statements:** P > Q > R = S; S > T = U
Conclusions: I. P > U II. P > T

A] Only I follows B] Both I and II follow
C] Neither I nor II follows D] Only II followsE]
Either I or II follows

Competitive Assignment

Direction (39): Study the following information carefully to answer the given questions.'M%N' means
'M is neither smaller nor equal to N'
'M&N' means 'M is neither greater nor equal to N''M$N'
means 'M is not smaller than N'
'M*N' means 'M is neither smaller nor greater than N''M@N'
means 'M is not greater than N'
Now in each of the following questions, assuming the given Statements to be follows, find which of the twoconclusions
given below them is/are follows

39. **Statement:** A$B, B&P, B @ Q, Q @ R
Conclusion: I. A @ Q II. B @ R

A] Only conclusion I is follows. B] Only conclusion II is follows.
C] Either conclusion I or II is follows. D] Neither conclusion I nor II is follows.E]
Both conclusion I and II are follows.

Directions (40-42): Study the following information carefully and answer the questions given below:

„P @Q" means „P is not smaller than Q."
„P %Q" means „P is neither greater than nor smaller than Q."
„P *Q" means „P is not greater than Q."
„P × Q" means „P is neither smaller than nor equal to Q."
„P #Q" means „P is neither greater than nor equal to Q."
Now in each of the following questions assuming the given statement to be follows, find which of the two conclusionsI and II give below them is/are definitely follows. Give answer:

A] Only conclusion I follows B] Only conclusion II follows
C] Either conclusion I or conclusion II follows D] Neither conclusion I nor II followsE]
Both conclusions I and II follows

40. **Statements:** M @ Q, Q × S, S % T
Conclusions: I. T #M II. M × S

41. **Statements:** A × B, B * C, C # A
Conclusions: I. B *A II. B #A

42. **Statements:** A % B, B * C, C @ D
Conclusions: I. A %C II. A #C

43. **Statement:** A>Q, B<T, A = B
Conclusions: I. B = Q II. B > Q

A] If only conclusion I is follows. B] If only conclusion II Is follows.
C] If either conclusion I or II is follows. D] Neither conclusion I nor II is follows.E]
Both conclusion I and II are follows.

44. **Statement:** Z < A, A > R, A = W
Conclusions: I. R < Z II. Z < W

A] If only conclusion I is follows. B] If only conclusion II Is follows.
C] If either conclusion I or II is follows. D] Neither conclusion I nor II is follows.E]
Both conclusion I and II are follows.

45. **Statement:** K > H ≥ Y = A < T ≤ I
Conclusions: I. A < I II. K ≥ A

A] Only Conclusion I follows B] Only Conclusion II follows
C] Either Conclusion I or II follows D] Neither Conclusion I nor II followsE]
Both Conclusion I and II follows

Directions(46-50): Study the following information carefully and answer the questions given below:
„A @ B" means „A is neither greater than nor smaller than B]"
„A % B" means „A is not greater than B]"
„A # B" means „A is neither smaller than nor equal to B]"
„A © B" means „A is not smaller than B]"
„A δ B" means „A is neither greater than nor equal to B]"

46. Statements : A # B, B @ C, C δ D

Conclusions : I.A # D II.A δ D

A] if only conclusion I is true
B] if only conclusion II is true
C] if either conclusion I or II is true
D] if neither conclusion I nor II is true

E] if both conclusions I and II are true

47. Statements : A δ B, C % D, B © CConclusions : I. A δ C II. B % D

A] if only conclusion I is true B] if only conclusion II is true
C] if either conclusion I or II is true D] if neither
conclusion I nor II is trueE] if both conclusions I and II are true

48. Statements : A # B, B @ C, C © D Conclusions : I. C δ A II. A # D

A] if only conclusion I is true B] if only conclusion II is true
C] if either conclusion I or II is true D] if neither
conclusion I nor II is trueE] if both conclusions I and II are true

49. Statements : W @ X, X © Y, Z δ YConclusions :I. W © Y II. X # Z

A] if only conclusion I is true B] if only conclusion II is true
C] if either conclusion I or II is true D] if neither
conclusion I nor II is trueE] if both conclusions I and II are true

50. Statements : W δ X, X @ Y, Y #Z Conclusions : I. W @ Y II.Z # C

A] if only conclusion I is true B] if only conclusion II is true
C] if either conclusion I or II is true D] if neither
conclusion I nor II is trueE] if both conclusions I and II are true

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

NUMBER SERIES

Class Practice Problems

1. B	2. C	3. D	4. D	5. B	6. A	7. D	8. C	9. C	10. C
11. A	12. C	13. B	14. A	15. A	16. D	17. C	18. A	19. C	20. D

Tutorial Practice Problems

1. D	2. A	3. D	4. A	5. C	6. A	7. B	8. C	9. C	10. A
11. C	12. A	13. D	14. C	15. A	16.	17. B	18.	19. D	20. B

Competition Level

1. D	2. A	3. B	4. C	5. B	6. E	7. A	8. D	9. C	10. D
11. B	12. A	13. E	14. C	15. B	16. A	17. E	18. D	19. D	20. A

Coding Decoding

Class Practice Problems

1. B	2. A	3. D	4. C	5. D	6. C	7. A	8. B	9. B	10. D
11. B	12. A	13. C	14. D	15. B	16. B	17. D	18. D	19. D	20. D

21. C	22. D	23. C	24. D						

Tutorial Practice Problems

1. B	2. C	3. D	4. A	5. C	6. B	7. A	8. D	9. C	10. C
11. C	12. B	13. C	14. C	15. C	16. D	17. C	18. D	19. D	20. D

ALPHABET TEST

Class Practice Problems

1. C	2. A	3. E	4. C	5. D	6. B	7. C	8. C	9. B	10. A
11. C	12. C	13. D	14. A	15. B	16. B	17. B	18. C	19. C	20. A

TUTORIAL PRACTICE PROBLEMS

1. C	2. B	3. A	4. C	5. C	6. A	7. C	8. C	9. C	10. C
11. D	12. B	13. D	14. B	15. C	16. D	17. A	18. B	19. D	20. B

Interest

Class Practice Problems

1. C	2. B	3. D	4. C	5. A	6. B	7. A	8. A	9. A	10. A
11. A	12. B	13. B	14. B	15. A	16. B	17. D	18. B	19. B	

Tutorial Practice Problems:

1. C	2. B	3. D	4. C	5. C	6. C	7. D	8. A	9. B	10. C
11. A	12. B	13. D	14. D	15. B	16. D	17. D	18. A	19. B	20. B

Competition Level

1.b	2.a	3.c	4.b	5.c	6.b	7.d	8.a	9.d	10.a
11.a	12.c	13.d	14.a	15.b	16.b	17.b	18.a	19.a	20.c
21.b	22.c	23.b	24.c	25.c	26.d	27.a	28.c	29.b	30.b

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 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					

Inequalities									
Q. No.	**Answer**	**Q. No.**	**Answer**	**Q. No.**	**Answer**	**Q. No.**	**Answer**	**Q. No.**	**Answer**
1.	A	2.	B	3.	D]	4.	B	5.	C
6.	D	7.	C	8.	D	9.	D	10.	A
11.	D	12.	B	13.	E	14.	C	15.	D
16	E	17.	B	18.	E	19.	D	20.	A
21.	A	22.	C	23.	B	24.	B	25.	A
26.	B	27.	C	28.	A	29.	B	30.	C
31.	E	32.	B	33.	E	34.	C	35.	A

36.	D	37.	A	38.	B	39.	B	40.	E
41.	B	42.	C	43.	C	44.	D	45.	A
46.	D	47.	D	48.	E	49.	E	50.	D

Puzzle Test									
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					