

# WORKBOOK OF Analytical Skills- II

**PEA-306**



**Department of Analytical Skills  
Centre for Professional Enhancement**

## **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 do not 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 covers all the types of the questions.

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## UNIT 1

### Time and Work, Pipes and cisterns

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  $\frac{1}{5}$  work in 1 day and same  $\frac{1}{5}$  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  $\frac{1}{8}$  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  $\frac{1}{n}$ .
- Similarly, if the work done by a person in one day is  $\frac{1}{k}$ , 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  $\frac{pq}{p+q}$  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  $\text{LCM}(p, q) \div (\text{lcm}/p + \text{lcm}/q)$  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 =  $\frac{1}{10}$

Work done by B in 1 day =  $\frac{1}{15}$

Work done by A and B together in 1 day =  $\frac{1}{10} + \frac{1}{15} = \frac{1}{6}$

They can complete it in 6 days.

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

$\frac{10 \times 15}{10 + 15} = \frac{150}{25} = 6$  days.

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

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

$\frac{30}{(\frac{30}{10} + \frac{30}{15})} = 6$  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

$$300/10 = 30, 300/15 = 20, 300/20 = 15 \text{ and } 300/25 = 12$$

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

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

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 =  $6 \times 1/18 = 1/3$

The remaining  $2/3$  work is done by B in 4 days and hence complete work done by B will be  $4 \times (3/2) = 6$  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 =  $4+4 = 8$  day-hours. Amount of work completed after two days =  $4+4 = 8$  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 =  $8+24 = 32$  day-hours. Similarly on 4th day the amount of work done would be  $4+8+12+16 = 40$  day-hours. Work done on the 5th day =  $4+12+16+20 = 52$  day-hours. Total work done after 5 days =  $8+32+40+52 = 132$  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 =  $2 \times (1/20) + (1/20 + 1/30 + 1/60) = 1/5$

So work completed in 15 days =  $5 \times 1/5 = 1$

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 men can complete a work in D2 day then  $M1 \times D1 = M2 \times D2$

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  $M1 \times D1 \times H1 = M2 \times D2 \times H2$

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

$$(M1 \times D1 \times H1)/W1 = (M2 \times D2 \times H2)/W2$$

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 :)]

$$x = (36 \times 18)/27$$

$$x = 24$$

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

$$30 \times 6 \times x = 39 \times 5 \times 12$$

$$x = 13$$

**Ex3.** - An industrial loom weaves 0.128 meters of cloth every second. Approximately, how many 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

$$x = (25 \times 1)/0.128$$

$$x = 195.31 \text{ So time will be approx. 195 seconds}$$

**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)

$$125 : 150 :: 35 : x$$

$$125 \times x = 150 \times 35$$

$$x = (150 \times 35)/125$$

$$x = 42.$$

**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)

$$\text{Books } 900:600 :: 18 : x$$

$$\text{Days } 12:10$$

$$(900 \times 12 \times x) = (600 \times 10 \times 18)$$

$$x = 600 \times 10 \times 18$$

$$x = 11.$$

**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?

$$[ (100 \times 35) + (100 \times 5) + (200 \times 5)] \text{ men can finish the work in 1 day}$$



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 can also be solved by using formula

$$(M_1 \times D_1 \times H_1)/W_1 = (M_2 \times D_2 \times H_2)/W_2$$

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.

### 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 & 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
4. 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
5. 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
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 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
8. 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
9. A can do a piece of work in 8 hours. B can do same piece of work in 12 hours. A starts working at 9AM 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
10. 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
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 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
13. 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
14. 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 many days will they take to complete it?
- A. 3 days  
B. 4 days  
C. 5 days  
D. 6 days

15. 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  $\frac{1}{3}$  days
- D. 56 and  $\frac{2}{3}$  days

16. 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

17. 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

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. 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

20. 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

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 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 ₹

23. 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 ₹
24. 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 ₹
25. 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
26. 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
27. A water tank can 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
28. 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
29. 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 L  
D. 8640 L
30. 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

31. 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
32. 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
33. 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
34. 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
35. 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
36. 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
37. 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
38. 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

39. 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

40. 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

### Company Specific

1. 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

2. 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

3. 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

4. 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

5. 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

6. 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
7. 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
8. 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
9. 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
10. 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
11. 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. 4days  
B. 3days  
C. 5days  
D. 6days
12. 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
13. 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

14. One pipe fill  $\frac{1}{4}$  of the tank in 4 minutes and another pipe fills  $\frac{1}{5}$  of the tank in 4 minutes. Find the time taken by both pipe together to fill half the tank?

- a)  $\frac{40}{9}$  minutes      b)  $\frac{50}{9}$  minutes
- c)  $\frac{44}{9}$  minutes      d)  $\frac{53}{9}$  minutes
- e) None of these

15. Two pipes can separately fill the tank in 15hrs and 30hrs respectively. Both the pipe are opened and when the tank is  $\frac{1}{3}$  full a leak is developed due to which  $\frac{1}{3}$  water supplied by the pipe leaks out. What is the total time to fill the tank?

- a)  $\frac{20}{3}$  hr      b)  $\frac{35}{3}$  hr      c)  $\frac{40}{3}$  hr
- d)  $\frac{50}{3}$  hr      e) None of these

16. Three pipes A, B and C is attached to a cistern. A can fill it in 20 minutes and B can fill it in 30 minutes. C is a waste pipe. After opening both the pipes A and B, Riya leaves the cistern to fill and returns when the cistern is supposed to be filled. But she found that waste pipe C had been left open, she closes it and now the cistern takes 5 minutes more to fill. In how much time the pipe C can empty the full cistern?

- a) 26.8 minutes      b) 25.8 minutes
- c) 27.8 minutes      d) 28.8 minutes
- e) None of these

17. A pipe can empty a tank in 60 minutes alone. Another pipe whose diameter is twice the diameter of first pipe is also opened. Now find the time in which both pipe will empty the tank together.

- a) 8 min      b) 10 min      c) 12 min
- d) 14 min      e) None of these

18. Two pipes P and Q can fill a tank in 10 min and 12 min respectively and a waste pipe can carry off 12 litres of water per minute. If all the pipes are opened when the tank is full and it takes one hour to empty the tank. Find the capacity of the tank.

- a) 30      b) 45      c) 60
- d) 75      e) None of these

19. Two pipes P and Q can fill a tank in 36 and 24 minutes respectively. If both the pipes are opened simultaneously, after how much time pipe Q should be closed so that tank is full in 30 minutes.

- a) 2min      b) 4min      c) 6min
- d) 8min      e) None of these

20. Two pipes A and B can fill a tank in 20 and 30 minutes respectively. Both the pipes are opened together but after 5 minutes pipe B is closed. What is the total time required to fill the tank

- a)  $16\frac{1}{3}$  min      b)  $16\frac{2}{3}$  min
- c)  $17\frac{2}{3}$  min      d)  $18\frac{2}{3}$  min
- e) None of these



## UNIT 2

### Time speed and 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.

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

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

$$\text{Distance} = \text{Speed} * \text{Time and,}$$

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

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

Solution:

$$\text{Distance} = \text{speed} * \text{time} = 40 * 15/60 = 10 \text{ km.}$$

#### 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,

$$\text{Average Speed when time is same} = (x+y)/2$$

**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,

$$\text{Average speed} = (45+65)/2 = 55 \text{ kmph.}$$

##### Case 2: Average Speed When Distance is Constant

$$\text{Average Speed} = 2ab/(a+b) \text{ (where a and b are two speeds)}$$

**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 = 36 kmph

### 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  $t_1$  and  $t_2$  time in reaching  $y$  and  $x$  respectively, then the ratio between the speed of two trains =  $\sqrt{t_2} : \sqrt{t_1}$

If two trains leave  $x$  and  $y$  stations at time  $t_1$  and  $t_2$  respectively and travel with speed  $L$  and  $M$  respectively, then distance from  $x$ , where two trains meet is =  $(t_2 - t_1) \times \{(product\ of\ speed) / (difference\ in\ speed)\}$

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  $t_1$  and  $t_2$  time to cross a pole, then the time taken by them to cross each other if the train is moving in opposite direction =  $(2 \times t_1 \times t_2) / (t_2 + t_1)$

If two trains of equal lengths and different speeds take  $t_1$  and  $t_2$  time to cross a pole, then the time taken by them to cross each other if the train is moving in the same direction =  $(2 \times t_1 \times t_2) / (t_2 - t_1)$

### Boat And Stream

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 =  $\frac{1}{2}$  (Downstream Speed + Upstream Speed)

Speed of Stream =  $\frac{1}{2}$  (Downstream Speed – Upstream Speed)

Average Speed of Boat =  $\{(\text{Upstream Speed} \times \text{Downstream Speed}) / \text{Boat's Speed in Still Water}\}$

### Practice Problems

1. A train is moving with a speed of 90 km/h. Its speed is  
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  
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. 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
5. 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] 25 km/hr
6. 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
7. 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
8. 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
9. 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
10. 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
11. 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 hrs 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
12. 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

13. A man covers  $\frac{1}{3}$  of his journey at 40 km/hr and the remaining at 20 km/hr. He takes 15 hour in total journey. The distance total journey is ?  
 A] 300 km                      B] 360 km                      C] 240km                      D] 120 km
14. A man covers  $\frac{1}{4}$  of his journey at 20 km/hr and the remaining at 30 km/hr. He takes 15 hour in total journey. The distance total journey is ?  
 A] 400 km                      B] 460 km                      C] 440km                      D] 420 km
15. 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
16. 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
17. Walking at  $\frac{7}{8}$  of its usual speed, a train is 10 minutes too late. Find its usual time to cover the journey.  
 A] 60 min                      B] 70 min                      C] 50 min                      D] 40 min
18. 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
19. 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.
20. 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.
21. A constable is 114 m behind a thief. The constable runs 21 m and the thief 15 m in a minute. In what time will the constable catch the thief?  
 A] 16 min                      B] 17 min                      C] 18 min                      D] 19 min
22. 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
23. 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

24. A student reaches his school from his residence 10 minutes late if he walks at a speed of 5km/hr and reaches 15 min early if he walks at a speed of 8km/hr. Find distance between his school & his residence.
- A] 4.48 km                      B] 6.6 km                      C] 5.56 km                      D] 8 km
25. A train leaves Delhi at 6 a.m. and reaches Agra at 10 a.m. Another train leaves Agra at 8 a.m. and reaches Delhi at 1:00 p.m. At what time do both trains cross each other?
- A] 8.30 a.m.                      B] 8.56 a.m.                      C] 9.06 a.m.                      D] 9.00 a.m.
26. Two trains of length 300 m and 200 m, traveling at 36 km/hr and 54 km/hr respectively, enter a two track tunnel 400 m simultaneously on different tracks and from opposite directions. After they have crossed each other, in how much time will tunnel be free of traffic?
- A] 20 second                      B] 15 second                      C] 36 second                      D] 70 second
27. A train starts from Delhi to Mumbai and another from Mumbai to Delhi. After meeting at Bhopal they take 16 hrs and 9 hours respectively to cover the remaining journey. If the speed of the train which heads towards Mumbai is 90 km/hr, find the speed of the other train.
- A] 67.5 km/hr                      B] 80 km/hr                      C] 90 km/hr                      D] 120 km/hr
28. A Police patrol party traveling at 60 km/h crossed and escaping thief traveling in the opposite direction at 48 km/h. The police party has to travel for a further 5 minutes before it can find a gap in the median where it can take a U turn and start chasing the thief. After how much time after the police party crosses the thief does it catch him?
- A] 25 minutes                      B] 50 minutes                      C] 15 minutes                      D] 32 minutes
29. 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
30. 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
31. 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 km/hr                      B] 5 km/hr  
C] 8 km/hr                      D] 9 km/hr
32. The speed of a boat in still water in 15 km/hr and the rate of current is 3 km/hr. The distance travelled downstream in 12 minutes is:
- A] 1.2 km                      B] 1.8 km                      C] 2.4 km                      D] 3.6 km
33. A boat takes 90 minutes less to travel 36 miles downstream than to travel the same distance upstream. If the speed of the boat in still water is 10 mph, the speed of the stream is:
- A] 2 mph                      B] 2.5 mph                      C] 3 mph                      D] 4 mph
34. A man can row at 5 kmph in still water. If the velocity of current is 1 kmph and it takes him 1 hour to row to a place and come back, how far is the place?
- A] 2.4 km                      B] 2.5 km                      C] 3 km                      D] 3.6 km

35. A boat covers a certain distance downstream in 1 hour, while it comes back in  $1\frac{1}{2}$  hours. If the speed of the stream be 3 kmph, what is the speed of the boat in still water?  
 A] 12 kmph                      B] 13 kmph                      C] 14 kmph                      D] 15 kmph
36. Speed of a boat in standing water is 9 kmph and the speed of the stream is 1.5 kmph. A man rows to a place at a distance of 105 km and comes back to the starting point. The total time taken by him is:  
 A] 16 hours                      B] 18 hours                      C] 20 hours                      D] 24 hours
37. 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 km/hr                      B] 1.5 km/hr                      C] 2 km/hr                      D] 2.5 km/hr
38. In a river flowing at 2 km/hr, a boat travels 32 km upstream and then returns downstream to the starting point. If its speed in still water be 6 km/hr, find the total journey time.  
 A] 10 hours                      B] 12 hours                      C] 14 hours                      D] 16 hours
39. A boat covers a certain distance downstream in 4 hours but takes 6 hours to return upstream to the starting point. If the speed of the stream be 3 km/hr, find the speed of the boat in still water  
 A] 15 km/hr                      B] 12 km/hr                      C] 13 km/hr                      D] 14 km/hr
40. If a man rows at the rate of 5 kmph in still water and his rate against the current is 3 kmph, then the man's rate along the current is:  
 A] 5 kmph                      B] 7 kmph                      C] 12 kmph                      D] 8 kmph
41. A man can row 8 km/hr in still water. If the river is running at 3 km/hr, it takes 3 hours more in upstream than to go downstream for the same distance. How far is the place?  
 A] 32.5 km                      B] 25 km                      C] 27.5 km                      D] 22.5 km
42. A man can row 4 kmph in still water. If the river is running at 2 kmph it takes 90 min to row to a place and back. How far is the place?  
 A] 2 km                      B] 4 km                      C] 5 km                      D] 2.25 km
43. At his usual rowing rate, Rahul can travel 12 miles downstream in a certain river in 6 hours less than it takes him to travel the same distance upstream. But if he could double his usual rowing rate for his 24-mile round trip, the downstream 12 miles would then take only one hour less than the upstream 12 miles. What is the speed of the current in miles per hour?  
 A]  $2\frac{1}{3}$  mph                      B]  $1\frac{1}{3}$  mph                      C]  $1\frac{2}{3}$  mph                      D]  $2\frac{2}{3}$  mph

### Company Specific

1. Walking at the rate of 4kmph a man covers certain distance in 2hr 45 min. Running at a speed of 16.5 kmph the man will cover the same distance in.  
 A] 12 min   B] 25 min   c] 40 min   d] 60 min
2. Two boys starting from the same place walk at a rate of 5kmph and 5.5kmph respectively. What time will they take to be 8.5km apart, if they walk in the same direction?  
 A] 17 hrs   B] 25 hrs   C] 31 hrs   D] 45 hrs

3. A thief steals a car at 2.30pm and drives it at 60kmph. The theft is discovered at 3pm and the owner sets off in another car at 75kmph when will he overtake the thief  
A] 5 pm    B] 6 pm    C] 5.30 pm    D] 4 pm
4. A man takes 5hr 45min in walking to certain place and riding back. He would have gained 2hrs by riding both ways. The time he would take to walk both ways is?  
A] 8 hr 45 min    B] 7 hr 45 min  
C] 7 hr 40 min    D] 8 hr 30 min
5. Two persons A and B start moving at each other from point P and Q respectively which are 1400 Km apart. Speed of A is 50 Km/hr and that of B is 20 Km/hr. How far is A from Q when he meets B for the 22nd time?  
A] 1000Km    B] 400Km    C] 800 Km    D] 1400 Km
6. Ram and Bharat travel the same distance at the rate of 6 km per hour and 10 km per hour respectively. If Ram takes 30 minutes longer than Bharat, the distance travelled by each is  
A] 6 km    B] 10 km    C] 7.5 km    D] 20 km
7. A cat takes 5 leaps for every 4 leaps of a dog, but 3 leaps of the dog are equal to 4 leaps of the cat. What is the ratio of the speed of the cat to that of the dog?  
A] 11 : 15    B] 15 : 11    C] 16 : 15    D] 15 : 16
8. Walking at  $\frac{3}{4}$  of his normal speed, Abhishek is 16 minutes late in reaching his office. The usual time taken by him to cover the distance between his home and the office is  
A] 48 min    B] 60 min    C] 42 min    D] 62 min
9. In covering a certain distance the speed of A and B are in the ratio of 6: 9, A takes 20 min more, than B to reach the destination. The time taken by A to reach the destination is:  
A] 1 Hour    B] 2 Hours  
C] 1 1/2 Hour    D] 1 1/4 Hour
10. Two trains of length 100m and 200m run on parallel tracks. When they run in the same direction it will take 20 seconds to cross each other and when they run in opposite direction it will take 10 seconds to cross each other. Find the speed (all in kmph) of 2 trains.  
A] 81, 27    B] 30, 81    C] 27, 20    D] 22.5, 7.5
11. A and B are two stations. A train goes from A to B at 64 km/h and returns to A at a slower speed. If its average speed for the whole journey is 56 km/h, at what speed did it return?  
A] 48 km/hr    B] 49.77 km/hr  
C] 30 km/hr    D] 47.46 km/hr
12. Two trains are running on parallel lines in the same direction at speeds of 40 Kmph and 20 Kmph respectively. The faster train crosses a man in the second train in 36 seconds. The length of the faster train is  
A] 200 m    B] 9185 m    C] 225 m    D] 210 m
13. A boat takes a circular route to travel a total distance of 24 km to reach its initial position. The speed of the boat in still water is 5 km/hr and the speed of the stream is 3 km/h. How much time (in hrs) does the boat travel upstream and downstream respectively?  
A] 12, 3    B] 3, 12    C] 5, 3    D] 3, 5
14. Boat goes downstream from P to Q in 2hrs, upstream in 6hrs and if speed of stream is 6kmph, then find the distance PQ  
A] 6 km    B] 4 km    C] 10 km    D] 36 km

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 km/hr                      B] 8 km/hr  
C] 6 km/hr                      D] 12 km/hr
16. A boat sails 15 km of a river towards upstream in 5 hours. How long will it take to cover the same distance downstream, if the speed of current is one-fourth the speed of the boat in still water:  
A] 1.8 h    B] 3 h            C] 4 h    D] 5 h
17. 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 : 4            C] 25 : 16    D] 16 : 25
18. In a stream running at 2 km/h, a motor boat goes 10 km upstream and returns to the starting point in 55 minutes. Find the speed (all in km/h) of the motor boat in still water.  
A] 2            B] 11            C] 22            D] None
19. 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] 10            B] 6            C] 5            D] 4
20. Speed of a boat in standing water is 14 kmph and the speed of the stream is 1.2 kmph. A man rows to a place at a distance of 4864 km and comes back to the starting point. The total time taken by him is:  
A] 700 hours                      B] 350 hours  
C] 1400 hours                      D] 1010 hours

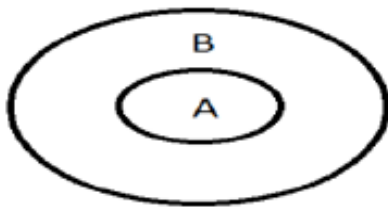


## UNIT 3

### Syllogism

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

#### CONCEPT 1 – All A is B

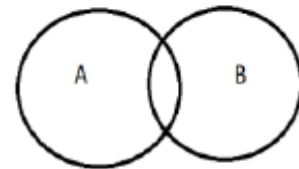


The Possible conclusions are:

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

#### CONCEPT 2 - Some A is B.

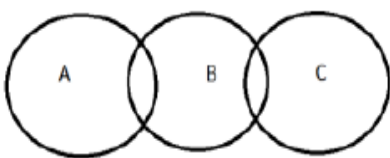
The Diagram for Some A is B is



The possible conclusions are:

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

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



Now the Possible Conclusions are:

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

There is no DIRECT CONNECTION between A and C.

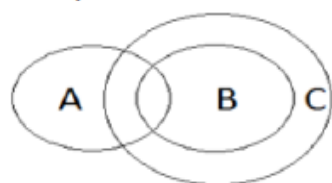
So it is not possible to derive any conclusion between

#### CONCEPT 4 – All A is B and All B is C

The Conclusions are:

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

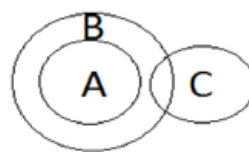
**Concept 5 – Some A is B, All B is C.**



The possible conclusions are:

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

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

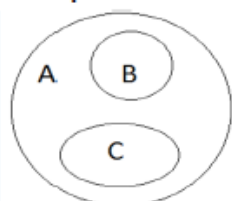


The possible conclusions are:

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

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

**Concept 7 – All B is A and All C is A**



The Possible Conclusions are:

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

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

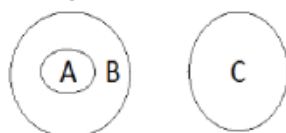
**Concept 8 – No A is B**



The Possible Conclusions are:

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

**Concept 9 – All A is B and No B is C**



The Possible Conclusions are:

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

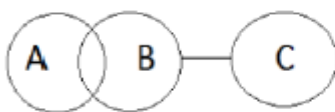
**Concept 10 – All A is B and No A is C**



The Possible Conclusions are:

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

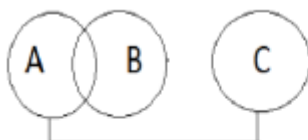
**Concept 11 – Some A is B; No B is C**



The Possible Conclusions are:

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

**Concept 12 – Some A is B; No A is C**



The Possible Conclusions are:

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

## Practice Problems

Directions (Questions 1-5): Given two statements, verify the conclusions and mark the answer as given below:

Mark (A) if only conclusion I follows.

(B) if only conclusion II follows.

(C) if both conclusions I & II follow.

(D) if no conclusion follows.

1. Statements: Some Goats are Birds. All Cars are Goats.

Conclusions: I. Some Cars are Birds. II. No Bird is Goat.

2. Statements: All Grapes are Bananas. All Bananas are Potatoes.

Conclusions: I. Some Potatoes are Bananas. II. Some Grapes are Potatoes.

3. Statements: Some Cats are Rats. Some Rats are Ants.

Conclusions: I. No Rat is Ant. II. No Cat is Ant.

4. Statements: All chalks are Dusters. Some Chalks are Boards.

Conclusions: I. Some Dusters are Boards. II. Some Chalks are Dusters.

5. Statements : Some Bags are Books. All Books are Boxes.

Conclusions: I. All Bags are Boxes. II. No Book is Boxes.

6. Statements: All roots are stems. Some branches are trees. Some stems are branches.

Conclusions: I. Some trees are stems II. Some trees are branches

III. All trees are stems IV. Some trees are not branches

A. Only I, II & III follow

B. Only I & II follow

C. Only I follows

D. Only II follow

7. Statements: All clouds are stars. No stars are planets. Some clouds are satellites.

Conclusions: I. No planet is cloud II. Some satellites are stars

III. Some planets are not satellites IV. Some satellites are not planets

A. Only II follows

B. Only I & II follows

C. Only I, II & IV follows

D. All follows

8. Statements: No mat is fan. Some fans are cars. All cars are shirts.

Conclusions: I. All mats are cars    II. All shirts are cars

III. Some shirts are fans IV. No shirt is a mat

A. Only either II or IV and III follow

B. Only I and II follow

C. Only IV follow

D. Only III follow

9. Statements: Some clips are copies.

Some copies are magazines.

No magazines is a dictionary

Conclusions: I. No copies are dictionary

II. Some copies are dictionary

III. Some copies are not dictionary

IV. No clips are magazines

A. Only III follows

B. Only either I or II & III follow

C. Only I follows

D. Only either I or II follows

10. Statements: Some headphones are earphones

All earphones are telephones.

No telephones are television

Conclusions: I. No earphones are television

II. Some headphones are not television

III. Some headphones are telephones

IV. Some telephones are not television

A. All follow

B. Only I, II & III follow

C. Only II, III & IV follow

D. Only I, III & IV follow

11. Statements: All pens are pencil. All pencils are eraser. Some erasers are colour. Some colours are brush.

Conclusion: I. All erasers are pen.

II. Some brush is pencil. III. Some erasers are not colour.

A. I and III.

B. Only III.

C. II and III.

D. None follows

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

Conclusions: I. All Hen being parrot is a possibility.

II. At least some peacock is parrot.

A. Neither I nor II follow.

B. I and II follow.

C. Only I follow.

D. Either I or II follow.

13. Statements: No A is C. All B is C. No B is D.

Conclusions: I. Some C is definitely not D. II. All B is not A.

A. Neither I nor II follow.

B. I and II follow.

C. Only I follow.

D. Either I or II follow.

14. Statements: Some Shirts are Skirts. Some Skirts are Buttons. All Trousers are Buttons.

Conclusions: I. Some Skirt are Trousers. II. All Trousers being Shirt is a possibility.

A. Neither I nor II follow.

B. I and II follow.

C. Only I follow.

D. Only II follow

15. Statements: All Wallet is Pocket. All Money is Pocket. Some Pocket is Rupees. No Rupees is Note.

Conclusions: I. Some Rupees is Wallet.

II. Some Pocket is not Note.

III. All Wallet being Note is a possibility.

IV. Some Money is Rupees.

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

D. If Either conclusion I or conclusion III follows.

16. Statements: All Even are Odd. All Composite are Prime. No Odd is Prime. Some Odd are Whole.

Conclusions: I. All even are not Composite.

II. No Prime is Even.

III. Some Whole are Composite.

IV. All Odd are not Prime.

- A) Only I, II and III follow
- B) Only I, II and IV follow
- C) All follow
- D) Only I and IV follow

17. Statements: All rivers are water. Some water is pond. No pond is tree. All trees are jungle.

Conclusion: I. Some rivers are pond.

II. Some water is not tree.

III. All rivers being jungle is a possibility.

- A. Only I.
- B. Only III.
- C. II and III.
- D. I and II.

18. Statements: Some triangles are square. All squares are cube. No cube is circle. Some circles are rectangle.

Conclusion: I. All triangles being circle is a possibility.

II. No square is circle.

III. Some triangle is cube.

- A. Only II.
- B. Only III.
- C. I and III.
- D. II and III.

19. Statements: All pens are pencil. All pencils are eraser. Some erasers are colour. Some colours are brush.

Conclusion: I. All erasers are pen.

II. Some brush is pencil.

III. Some erasers are not colour.

A. I and III.

B. Only III.

C. II and III.

D. None follows

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

Conclusions: I. All Hen being parrot is a possibility.

II. At least some peacock is parrot.

A. Neither I nor II follow.

B. I and II follow.

C. Only I follow.

D. Either I or II follow.

21. Statements: No A is C. All B is C. No B is D.

Conclusions: I. Some C is definitely not D. II. All B is not A.

A. Neither I nor II follow.

B. I and II follow.

C. Only I follow.

D. Either I or II follow.

22. Statements: Some Shirts are Skirts. Some Skirts are Buttons. All Trousers are Buttons.

Conclusions: I. Some Skirt are Trousers.

II. All Trousers being Shirt is a possibility.

A. Neither I nor II follow.

B. I and II follow.

C. Only I follow.

D. Only II follow

23. Statements: All Wallet is Pocket. All Money is Pocket. Some Pocket is Rupees. No Rupees is Note. Conclusions:

I. Some Rupees is Wallet.

II. Some Pocket is not Note.

III. All Wallet being Note is a possibility.

IV. Some Money is Rupees.



- A. If only conclusion II follows.
- B. If conclusion II and conclusion III follows.
- C. None conclusion follows.
- D. If either conclusion I or conclusion III follows.

24. Statements: Some cats are white. Some white are dog. All dogs are blue.

No dog is monkey. All monkeys are tall.

Conclusion:

- I. Some tall is not dog.
- II. Some cat is dog.
- III. All blue being monkeys is a possibility.

- A. Only I
- B. I and III
- C. II and III
- D. Only II

25. Statements:

- I. No black is orange. II. All yellow is orange.
- III. Some yellow is green. IV. All green is pink.

Conclusion:

- I. Some orange are pink.
- II. All orange being yellow is a possibility.
- III. Some green is not black.

- A. Only I.
- B. Only III.
- C. I and III.
- D. All follow

## RANKING TEST

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

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

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

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

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

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

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

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

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

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

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

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

MRJ ©F9 \*E2 ?

A. Y5I B. YIQ C. A5Q D. YIZ

Direction (Q6-8):- R 4 3 % M @ K E F 5 A # J N I 8 U © D B P 6 I W 7 Q Q \* Z

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

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

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

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

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

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

Direction(Q9-12): 832 719 654 967 481

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

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

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

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

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

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

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

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

13. If the order of the digits in each of the following numbers is reversed and then newly formed numbers are arranged in ascending order, what will be the middle digit of the fourth number from the top?

845, 632, 489, 398, 817, 546, 279, 638

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

Direction(Q14-17): 235 762 198 438 623 911

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

A. Data inadequate B. 14th

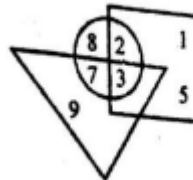
C. 15th D. 16th

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

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

### Venn Diagram

1. In the given figure in a garden, square represent the area where jackfruit trees are grown, circle represent mango trees and triangle represent coconut trees. Which numbers represent

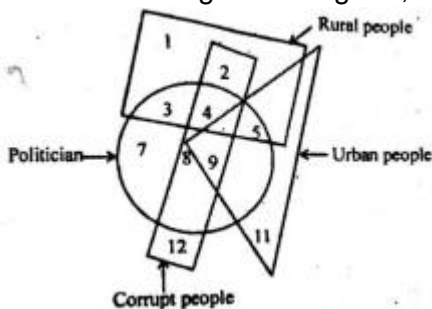


the common area in which all types of trees are grown.

(a) 4 (b) 3

(c) 7 (d) 8

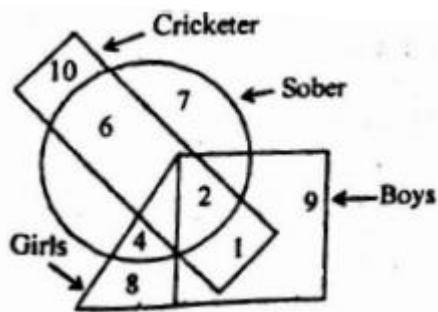
2. In the following venn diagram, Identify the politicians from urban areas who are corrupt.



(a) 4 (b) 8

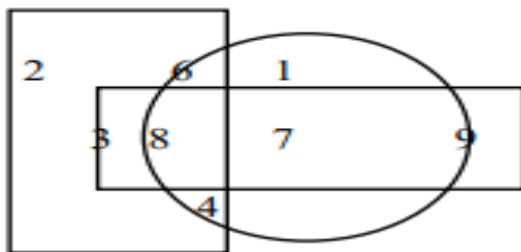
(c) 9 (d) 10

3. In the following figure, the boys who are cricketer and sober are indicated by which

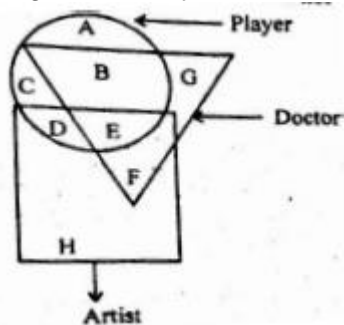


number?

- (a) 6 (b) 5  
(c) 4 (d) 2
4. Which are the numbers that makes their presence felt in only one of the geometric figures.

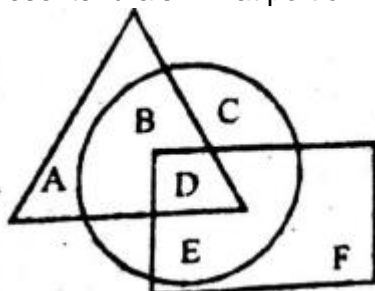


- (a) 4,6,7 (b) 1,2,9  
(c) 3,7,9 (d) 2,3,8
5. 29. In the following venn diagram identify the better which denotes players who are also



doctors but not artist.

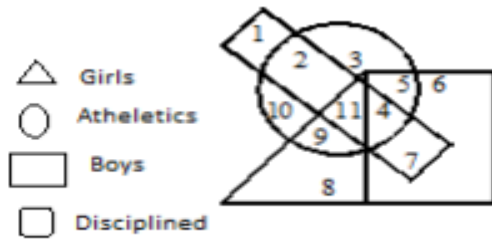
- (a)  $B + E$  (b)  $E$   
(c)  $B$  (d)  $A$
6. In the given figure, the circle represents boys, triangle represents players and square represents rurals. What portion represents rural sports boys.



(a) E (b) F

(c) D (d) B

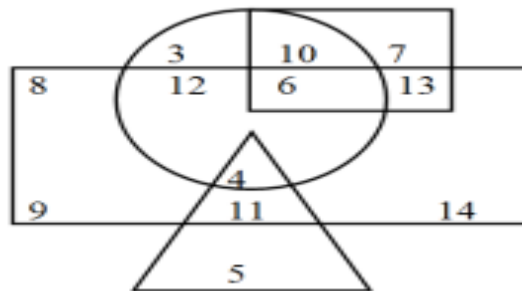
7. The boys who are athletic and are disciplined are indicated by which numbers.



(a) 1 (b) 4

(c) 6 (d) 10

Directions (Qs. 8-14): The following questions are based on the diagram given below.



Rectangle represents males

Triangle represents educated

Circle represents urban

Square represents civil servants

Reasoning Venn Diagram

8. Who among the following is an educated male who is not an urban resident?

(a) 4 . (b) 5

(c) 11 (d) 9

9. Who among the following is neither a civil servant nor educated but is urban and not a male?

(a) 2 (b) 3

(c) 6 (d) 10

10. Who among the following is a female urban resident and also a civil servant?

(a) 6 (b) 7

(c) 10 (d) 13

11. Who among the following is an educated male who hails from urban?

(a) 4 (b) 7

(c) 10 (d) 13

12. Who among the following is uneducated and also an urban male?

(a) 2 (b) 3

(c) 11 (d) 12

13. Who among the following is only a civil servant but neither a male nor urban oriented and uneducated?

(a) 7 (b) 8

(c) 9 (d) 14

14. Who among the following is a male urban oriented and also a civil servant but not educated?

(a) 13 (b) 12

(c) 6 (d) 10

### Company specific

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

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

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

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

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

3. Count each 7 which is not immediately preceded by 5 but is immediately followed by either 2 or 3. How many such

7's are there ? 5 7 2 6 5 7 3 8 3 7 3 2 5 7 2 7 3 4 8 2 6 7 8

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

4. In the following sequence, if the positions of the letters in the sequence remain unchanged and the positions of the numbers in the sequence are reversed then which of the following letter/number is fifth to right of ninth letter/number

from the right? Q D T P 5 2 3 F G 5 4 B 7 H J 9 K 6 M N 8

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

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

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

Direction:- (6-7) Amongst five friends, each got a different percentage of marks in the examination. Poonam scored more than Ben but less than Ajay. Ajay scored 70% marks.

Shreya scored less marks only than Kim. The one who scored the minimum marks scored 65% marks and the one who scored the highest, scored 87% marks.

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

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

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

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

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

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

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

9. Who among the following men is tallest?

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

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

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

11. Statements:

All Laptop is Camera. Some Camera is Speaker. All Music is Speaker. Some Speaker is Photo.

Conclusions:

I. All Laptop being Photo is a possibility.

II. Some Speaker is Photo.

III. All Camera is Music.

IV. No Laptop is Photo.

A. If only conclusion III follows.

B. If only conclusion I and conclusion III follows.

C. If conclusion follows.

D. If conclusion I and conclusion II follows.

12. Statements: All Song is Lyrics. No Lyrics is Machine.

All TV is Tablet. All Tablet is Machine.

Conclusions:

I. No Song is TV.

II. Some Machine is Tablet.



III. No Tablet is Lyrics.

IV. Some TV is Machine.

A. If only conclusion II follows.

B. If conclusion II and conclusion III follows.

C. None conclusion follows.

D. All conclusion follows.

13. Statements: Some Dog is Cat. All Jocker is Cat. No Jocker is Donkey. Some Donkey is Horse.

Conclusions:

I. Some Cat is Donkey.

II. All Dog is Horse.

III. All Jocker being Horse is a possibility.

IV. No Dog is Horse.

A. If only conclusion II and conclusion III follows.

B. If only conclusion I, conclusion II and conclusion III follows.

C. If none conclusion follows.

D. If Either conclusion II or conclusion IV follow.

14. Statements: No Ink is Key All Key is Lock. Some Lock is Iron. All Oil is Iron.

Conclusions:

I. All Ink being Lock is a possibility.

II. Some Oil is Key.

III. Some Iron is Key.

IV. All Key being oil is a possibility.

A. If All conclusion follows.

B. If only conclusion II and III follow.

C. If conclusion I and conclusion IV follows.

D. If conclusion II and conclusion III follows.

Direction (Q.15-20): In each of the questions below, three statements are given followed by two conclusions numbered

(I) and (II) are given. You have to consider the statements to be true even if they seem to be at variance with commonly known facts. You have to decide which of the following conclusions logically follows from the given statements. Give answer.

(A) If only conclusion I follows.

(B) If only conclusion II follows.

(C) If either conclusion I or conclusion II follows.

(D) If neither conclusion I nor conclusion II follows.

(E) If both conclusion I and II follow.

15. Statements:

All gold is silver. No silver is stone. All metal is silver.

Conclusion:

I. Some stones being metal is a possibility.

II. Some silver is gold.

16. Statements:

No pearl is paper. Some diamond is water. All diamond is paper

Conclusion:

I. No diamond is pearl

II. Some pearl being water is a possibility

17. Statements: Some circle is square. Some cone is square. No square is cube

Conclusion:

I. Not every circle is cube

II. Some cones are not cube

18. Statements: All tables is chair. All balloons is biscuit. Some chair is balloon

Conclusion:

(I) A few chair is biscuit

(II) All tables is biscuit

19. Statements: No ring is money. All pocket is money. No pocket is door

Conclusion:

I. Some ring is door

II. No ring is door

20. Statements: Some cloud is bird. No bird is car. All car is banana

Conclusion:

I. Some banana are not bird.

II. All cloud being banana is a possibility

## UNIT 4

### Mensuration

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

Difference between mensuration and geometry

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

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

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

Important Formulas

#### Formula for 2D Mensuration

##### 1) Rectangle

Perimeter of a Rectangle =  $2(\text{Length} + \text{Breadth})$

Area of a Rectangle =  $\text{Length} \times \text{Breadth}$

##### 2) Square

Area of a Square =  $\text{Side}^2$

Perimeter of a Square =  $4(\text{Side})$

##### 3) Circle

Diameter of a Circle =  $2 \times \text{Radius}$

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

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

##### 4) Triangle

Area of a Triangle =  $\frac{1}{2} \times b \times h$

##### 5) Parallelogram

Perimeter of a Parallelogram =  $2(a+b)$

Area of a Parallelogram =  $b \times h$

Formula for 3D Mensuration

##### 1) Cube

Volume of a Cube =  $\text{Side}^3$  cubic units.

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

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

## 2) Cuboid

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

Lateral Surface Area of a Cuboid =  $2 \times \text{height} (\text{length} + \text{width})$  sq. units.

Total Surface Area of a Cuboid =  $2(\text{length} \times \text{width} + \text{length} \times \text{height} + \text{height} \times \text{width})$  sq. Units.

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

## 3) Cone

Volume of a Cone =  $\frac{1}{3} \times \pi \times \text{radius}^2 \times \text{height}$  cubic units.

Total Surface Area of the Cone =  $\pi r (\text{slant height} + \text{radius})$

## 4) Sphere

Volume of a Sphere =  $\frac{4}{3} \times \pi \times \text{radius}^3$  cubic units.

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

## 4) Hemi-Sphere

Volume of a Hemi-Sphere =  $\frac{2}{3} \times \pi \times \text{radius}^3$  cubic units.

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

# CLOCKS AND CALENDARS

## 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

=  $(76 \times 1 + 24 \times 2)$  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 =  $(5 \times 2) = 3$  odd days.

Number of odd days in 300 years =  $(5 \times 3) = 1$  odd day.

Number of odd days in 400 years =  $(5 \times 4 + 1) = 0$  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 =  $360^\circ$ .
- vii. Angle traced by minute hand in 60 min. =  $360^\circ$ .
- 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

## **Practice Problems**

1. Bajinder runs ten times around a square track and covers 4km. Find the length of the track.

A] 400 m B] 400cm C] 40 m D] None of these

2. The perimeter of a regular pentagon is 1540cm. How long is its each side?

A] 380 m B] 308cm C] 154 m D] None of these

3. The length of a rectangular field is twice its breadth. Jamal jogged around it four times and covered a distance of 6km. What is the length of the field?

A] 1000 m B] 500cm C] 1000 cm D] None of these

4. Base of a tent is a regular hexagon of perimeter 42cm. What is the length of each side of the base?  
A] 6 cm B] 7cm C] 21 cm D] None of these
5. Length of a rectangle is three times its breadth. Perimeter of the rectangle is 120 cm. Find its length.  
A] 20 cm B] 15cm C] 5 cm D] None of these
6. The side of a square is 10cm. How many times will the new perimeter become if the side of the square is doubled?  
A] 2 B] 4 C] 6 D] None of these
7. The sides of a rectangle are in the ratio of 6:5 and its area is 3630 sq.m. Find the perimeter of rectangle.  
A] 120 m B] 121 Cm C] 242 m D] None of these
8. A rectangular mat has an area of 120 sq. metres and perimeter of 46 m. The length of its diagonal is:  
A] 17 Cm B] 17 m C] 17 m 2 D] 16 m
9. A rectangle measures 8 Cm on length and its diagonal measures 17 Cm. What is the perimeter of the rectangle?  
A] 46 Cm B] 48 Cm C] 46 m D] None of these
10. A rectangular courtyard 3.78 m long and 5.25 m broad is to be paved exactly with square tiles, all of the same size. The minimum number of such tiles is:  
A] 350 B] 254 C] 450 D] 495
11. The ratio of the areas of two squares, one having double its diagonal then the other is:  
A] 1 : 3 B] 3 : 1 C] 1 : 4 D] 4 : 1
12. Of the two square fields, the area of the one is 1 hectare, while another one is broader by 1%. There differences in area is:  
A] 200 m B] 201 m C] 201 m D] None of these
13. Find the cost of carpenting a room 13 m long and 9 m broad with a carpet 100 Cm broad at the rate of Rs.20 per meter.  
A] Rs. 2340 B] Rs. 2400 C] Rs. 1890 D] Rs.2430
14. A girl walking at the rate of 9 Km per hour crosses a square field diagonally in 12 seconds. The area of the field is:  
A] 460 sq.m B] 600 sq.m C] 510 sq.m D] 450 sq.m
15. The inner circumference of a circle race track 18 m wide is 880 m. Find the radius of the outer circle.  
A] 140 m B] 150 m C] 158 m D] None of these

16. The perimeter of a square circumscribed about a circle of radius  $r$  is:

A]  $12r$  B]  $16r$  C]  $64r$  D]  $8r$

17. The area of a square field is  $4802 \text{ m}^2$  the length of its diagonal is:

A]  $94 \text{ m}$  B]  $96 \text{ m}$  C]  $98 \text{ m}$  D] None of these

18. The diagonal of a rhombus are  $65 \text{ m}$  and  $60 \text{ m}$ . Its area is:

A]  $1950 \text{ Cm}^3$  B]  $1950 \text{ Cm}^2$  C]  $1960 \text{ Cm}^2$  D]  $1960 \text{ Cm}^3$

19. The diagonal of a square is  $40 \text{ m}$ . The area of the square is:

A]  $800 \text{ m}^2$  B]  $800 \text{ m}^3$  C]  $750 \text{ m}^2$  D] none of these

20. The area of the largest triangle that can be inscribed in a semicircle of radius  $r \text{ Cm}$ , is:

A]  $r^3 \text{ Cm}^2$  B]  $r^2 \text{ Cm}^3$  C]  $r^2 \text{ Cm}^2$  D]  $r^3 \text{ Cm}^3$

21. The radius of a cylinder is  $10 \text{ m}$ , height  $14 \text{ m}$ . The volume of the cylinder is:

A]  $4000 \text{ m}^2$  B]  $4300 \text{ m}^2$  C]  $4000 \text{ m}^3$  D] none of these

22. The radius of a cylinder is  $12 \text{ m}$ , height  $21 \text{ m}$ . the lateral surface area of the cylinder is:

A]  $1584 \text{ m}^3$  B]  $1582 \text{ m}^2$  C]  $1584 \text{ m}^2$  D] none of these

23. The radius of a cylinder is  $6 \text{ m}$ , height  $21 \text{ m}$ . The total surface area of the cylinder is?

A]  $1011.20 \text{ Cm}^3$  B]  $1029.22 \text{ Cm}^3$  C]  $1009.26 \text{ Cm}^3$  D]  $1018.28 \text{ Cm}^2$

24. The height of a cylinder is  $60 \text{ Cm}$  and the diameter of its base is  $5 \text{ Cm}$ . The total surface area of the cylinder is :

A]  $981 \text{ Cm}^2$  B]  $982.13 \text{ Cm}^2$  C]  $982.14 \text{ Cm}^2$  D] None of these

25. The height of cylinder is  $14 \text{ Cm}$  and its diameter is  $10 \text{ Cm}$ . The volume of the cylinder is:

A]  $110 \text{ Cm}^3$  B]  $1100 \text{ Cm}^3$  C]  $1101 \text{ Cm}^2$  D]  $1101 \text{ Cm}^3$

26. Two cylinders of their radius in the ratio  $3 : 5$  and heights in the ratio  $10 : 9$ . Then find the volumes ratio?

A]  $5 : 2$  B]  $5 : 3$  C]  $2 : 3$  D]  $2 : 5$

27. Sixteen cylindrical cans, each with a radius of  $1$  unit, are placed inside a cardboard box four in a row. If the cans touch the adjacent cans and or the walls of the box, then which of the following could be the interior area of the bottom of the box in square units?

(a)  $16$  (b)  $32$  (c)  $64$  (d)  $128$

28. A conical tent is to accommodate  $10$  persons, Each person must have  $6 \text{ m}^2$  space to sit and  $30 \text{ m}^3$  of air to breadth. What will be the height of the cone?

(a)  $37.5 \text{ m}$  (b)  $150 \text{ m}$  (c)  $75 \text{ m}$  (d) None of these

29. A solid sphere of radius  $6 \text{ cm}$  is melted into a hollow cylinder of uniform thickness. If external radius of the base of the cylinder is  $5 \text{ cm}$  and its height is  $32 \text{ cm}$ , find the uniform thickness of the cylinder?

(a)  $2 \text{ cm}$  (b)  $3 \text{ cm}$  (c)  $1 \text{ cm}$  (d)  $3.5 \text{ cm}$

30. A cylindrical cistern whose diameter is 21 cm is partly filled with water. If a rectangular block of iron 14 cm in length, 10.5 cm in breadth and 11 cm in thickness is wholly immersed in water, by how many centimetres will the water level rise?

(a) 14 cm (b) 20 cm (c)  $14/3$  cm (d) 12 cm

### Calendar

1. If holiday are declared only on Sundays and 19 th March in a particular year was a Sunday, is 23 rd September a holiday in that year?

- A] Yes, 23 rd September is a holiday
- B] 23 rd September is not a holiday
- C] 23 rd September is a holiday only if it is a leap year
- D] Cannot be determined

2. If today is Sunday, then what day of the week will be the 426 th day from today?

- A] Saturday B] Friday
- C] Tuesday D] Wednesday

3. 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

4. If the first day of the year 2005 is a Saturday, then what day of the week will be 1 st January, 2009?

- A] Thursday B] Friday
- C] Sunday D] Monday

5. What day of the week will 1 st January, 2018 be, given that 1 st January, 2012 is a Saturday?

- A] Monday B] Saturday
- C] Sunday D] Friday

6. Which year will have the same Calendar as that of 2002?

- A] 2008 B] 2011
- C] 2009 D] 2013

7. Which year will have the same calendar as that of 2008?

- A] 2014 B] 2024
- C] 2032 D] 2036



8. Which among the following years is a leap year?  
A] 2600 B] 2700  
C] 2800 D] 3000
9. What day of the week was 18 th July, 1978?  
A] Sunday B] Monday  
C] Tuesday D] Friday
10. What day of the week would be 26 th March, 2023?  
A] Sunday B] Monday  
C] Tuesday D] Friday
11. Which will be the next leap year after 2096?  
A] 2100 B] 2102  
C] 2104 D] 2108
12. 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
13. How many days are there in  $x$  weeks  $x$  days?  
A]  $7x + 2$  B]  $8x$   
C]  $14x$  D] 7
14. How many days are there altogether in  $p$  weeks and  $q$  days?  
A]  $(p + q)$  days B]  $pq$  days  
C]  $(7p + q)$  days D]  $(7q + p)$  days
15. Which day fell on 8 th June, 2007?  
A] Friday B] Saturday  
C] Sunday C] Wednesday
16. An author was born on 2 nd January, 1949. Which day of the week on that day?  
A] Monday B] Tuesday  
C] Wednesday D] None of these
17. The calendar of which year is similar to the calendar of the year 1990?  
A] 1994 B] 1996  
C] 1997 D] 2001

18. The calendar of which of the following year is similar to that of 2003?

A] 2009 B] 2010

C] 2012 D] 2014

19. 5<sup>th</sup> June, 2007 was Tuesday. Which day will fall on 5<sup>th</sup> June, 2006?

A] Sunday B] Monday

C] Tuesday D] Wednesday

20. India became a Republic day on 26<sup>th</sup> January, 1950. Which day of the week was it?

A] Monday B] Tuesday

C] Thursday D] Saturday

21. Today is a Tuesday. Which day will it be after 62 days from today?

A] Wednesday B] Monday

C] Tuesday D] Sunday

22. The 1<sup>st</sup> Monday of April, 2006 was on which date?

A] 2<sup>nd</sup> April B] 3<sup>rd</sup> April

C] 4<sup>th</sup> April D] 5<sup>th</sup> April

23. Which day fell on 19<sup>th</sup> October, 2000?

A] Tuesday B] Thursday

C] Friday D] Saturday

24. If 20<sup>th</sup> January, 2000 was a Thursday, then what day of the week was 26<sup>th</sup> February, 1997?

A] Tuesday

B] Sunday

C] Wednesday

D] Thursday

25. 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

26. On what days of July, 1976 did Sunday fall?

(a) Sunday 1<sup>st</sup>, 8<sup>th</sup>, 16<sup>th</sup>

(b) Sunday 6<sup>th</sup>, 20<sup>th</sup>, 27<sup>th</sup>

(c) Sunday 5<sup>th</sup>, 12<sup>th</sup>, 19<sup>th</sup>

(d) Sunday 14<sup>th</sup>, 21<sup>st</sup>, 28<sup>th</sup>

27. What dates of July 2004 were Mondays?

- (a) 1th, 8th, 15th, 22nd, 29<sup>th</sup>
- (b) 5th, 12th, 19st, 26th
- (c) 4nd, 11th, 18th, 25<sup>th</sup>
- (d) 6th, 13th, 20th, 27nd

28. A person born on 25th March 1925 used to enjoy every Monday as a holiday after attaining his 25th birthday. How many weekends could he have enjoyed such a holiday before attaining his 30th birthday?

- (a) 260
- (b) 261
- (c) 272
- (d) 250

29. How many times the 29th day of the Month does occur in 400 consecutive years?

- (a) 4500
- (b) 4498
- (c) 4497
- (d) 4495

30. 25. Consider the dates 9.11.99 or 11.9.99, depending on how you write the date. Either way, Day \* Month = Year, where the year is written as the last two digits. How many other days in the 20th century can you find that will have this property?

- (a) 211 days
- (b) 212 days
- (c) 214 days
- (d) 215 days

### Clock

1. How many degrees' hour's hand rotates in 10 minutes?

- (a) 5 degrees
- (b) 10 degree
- (c) 20 degree
- (d) 60 degree

2. Find the time between 5 and 6 o'clock when the two hands of clock are 6 minutes' spaces apart.

- (a) 2  $\frac{2}{11}$  minutes past 5 o'clock
- (b) 33  $\frac{9}{11}$  minutes past 5 o'clock or  $\frac{1}{20}$  (8/11) minutes past 5 o'clock
- (c) 4  $\frac{2}{11}$  minutes past 5 o'clock
- (d) 6  $\frac{6}{11}$  minutes past 5 o'clock

3. What is the angle between the two hands at 3 o'clock?

- (a) 122 degree
- (b) 70 degree
- (c) 48 degree
- (d) 90 degree

4. Find the time between 4 and 5 o'clock when the two hand of clock are 3 minutes' spaces apart.

- (a) 3  $\frac{2}{11}$  minutes past 4 o'clock
- (b) 18  $\frac{6}{11}$  minutes past 4 o'clock
- (c) 2  $\frac{2}{11}$  minutes past 4 o'clock
- (d) 10  $\frac{2}{11}$  minutes past 4 o'clock

5. If in a clock the number 1 to 12 are replaced with alphabet starting from F, then which of the following options shall indicate the time as 9'o clock?

- (a) Q – N
- (b) P – M
- (c) N – P
- (d) N – Q

6. The quarter of the time from midnight to present time added to the half of the time from the present to midnight gives the present time. What is the present time?

- (a) 36 min past 9    (b) 12 min past 9  
(c) 36 min past 8    (d) 12 min past 8

7. A man walks from 9.15 to 5.15 from Monday to Friday and 9.00 to 12.00 on Saturday. Each day the lunch is for 45 minutes. How much time does he walk in a week?

- (a) 39 hrs 15 min    (b) 39 hrs 10 min  
(c) 39 hrs 20 min    (d) 39 hrs 40 min

8. How many times do the hands of a clock come at right angle in a day?

- (a) 44                      (b) 11  
(c) 105                    (d) 54

9. Find the angle in degrees between the minute hand and the hour hand of a clock when the time is 4.20.

- (a) 10                      (b) 0  
(c) 5                        (d) 5.5

10. Find the angle in degrees between the hour hand and the minute hand of a clock when the time is 3:25.

- (a) 100                    (b) 47.5  
(c) 59                      (d) 55

11. The angle in degrees between the hour hand and the minute hand of a clock when the time is 8.30 a.m. is

- (a) 75                      (b) 47.5  
(c) 65                      (d) 90

12. A clock is set right at 5 a.m. The clock loses 16 minutes in 24 hours. What will be the true time when the clock indicates 10 p.m. on 4th day?

- (a) 8 p.m.                (b) 9 p.m.  
(c) 10 p.m.              (d) 11 p.m.

13. The Tremors of earthquake were felt at intervals of 15 seconds. The first tremor was felt at 08:54:57 and last tremor was felt at 10:45:12. How many times were the tremors felt?

- (a) 484                    (b) 485  
(c) 441                    (d) 525

14. The time in the clock is 8:20. What is its mirror image?

- (a) 3:20                    (b) 3:40  
(c) 2:25                    (d) 4:20

15. A watch gains 5 seconds in 3 minutes and was set right at 8 AM. What time will it show at 10 PM on the same day?

- (a) 10:22:20 PM      (b) 10:23:10 P  
(c) 10:33:20 PM      (d) 10:23:20 PM

16. Three cuckoo clocks are such that the cuckoos chime after every 10 minutes, 20 minutes and 35 minutes respectively. If the 3 clocks chime simultaneously at 2pm, at what time will they chime together again?

- (a) 3 p.m.              (b) 1:40 p.m.  
(c) 3 a.m.              (d) 1:40 a.m.

17. The minute hand of a clock is found to cross the hour hand  $x$  minutes past three. Find  $x$ .

- (a)  $10 \frac{5}{11}$               (b)  $15 \frac{15}{11}$   
(c)  $16 \frac{4}{11}$               (d)  $21 \frac{9}{11}$

18. The number of minutes from midnight to now is 9 times the number of minutes from now to noon. What time is it now?

- (a) 10.50 a.m.              (b) 10.48 a.m.  
(c) 10.40 a.m.              (d) 10.53 a.m.

19. A friend of mine invented a new clock. It times an entire day in 10 hours, each hour in 100 minutes and each minute in 100 seconds. What normal time is it when it reads 5:41?

- (a) 12:59:02              (b) 12:59:01  
(c) 11:59:02              (d) None of these

20. The minute hand of a clock overtakes the hour hand at intervals of 65 minutes of the correct time. How much a day does the clock gain or lose in minutes?

- (a)  $1440/143$               (b)  $1444/143$   
(c)  $1400/143$               (d)  $4440/143$

### Company Specific

1. Two goats are tethered to diagonally opposite vertices of a field formed by joining the mid-points of the adjacent sides of another square field of side  $20\sqrt{2}$  m. What is the total grazing area of the two goats if the length of the rope by which the goats are tethered is  $10\sqrt{2}$  m?

- A.  $100\pi \text{ m}^2$  B.  $50(\sqrt{2}-1)\pi \text{ m}^2$  C.  $100\pi(3-2\sqrt{2}) \text{ m}^2$  D.  $200\pi(2-\sqrt{2}) \text{ m}^2$

2. The radius of the base and the height of a right circular cylinder are 3.5 cm and 7.5 cm respectively. The ratio of the total surface area to the curved surface area of the cylinder will be

- A. 22 : 5 B. 22 : 15 C. 22 : 7 D. 22 : 17

3. From a solid sphere of radius 15 cm, a right circular cylindrical hole of radius 9 cm whose axis passing through the centre is removed. The total surface area of the remaining solid is:

- A.  $1188\pi \text{ cm}^2$  B.  $108\pi \text{ cm}^2$  C.  $1170\pi \text{ cm}^2$  D.  $144\pi \text{ cm}^2$

4. A conical circus tent is to be made of canvas. The height of the tent is 35 m and the radius of the base is 84 m. If  $\pi = \frac{22}{7}$ , then the canvas required is:
- A. 24000 m<sup>2</sup> B. 24004 m<sup>2</sup> C. 24014 m<sup>2</sup> D. 24024 m<sup>2</sup>
5. Water flows at the rate of 10 m per minute from a cylindrical pipe 5 mm in diameter. A conical vessel whose diameter is 40 cm and depth 24 cm is filled. The time taken to fill the conical vessel is:
- A. 50 min B. 50 min. 12 sec C. 51 min. 12 sec D. 51 min. 15 sec
6. A cone, a hemisphere and a cylinder stand on equal bases of radius R and have equal heights H. Their whole surfaces are in the ratio:
- A.  $(\sqrt{3}+1) : 3 : 4$  B.  $(\sqrt{2}+1) : 7 : 8$  C.  $(\sqrt{2}+1) : 3 : 4$  D. None of these
7. A cylinder is circumscribed about a hemisphere and a cone is inscribed in the cylinder so as to have its vertex at the centre of one end and the other end as its base. The volumes of the cylinder, hemisphere and the cone are respectively in the ratio of:
- A.  $3 : \sqrt{3} : 2$  B.  $3 : 2 : 1$  C.  $1 : 2 : 3$  D.  $2 : 3 : 1$
8. A large solid sphere of diameter 15 m is melted and recast into several small spheres of diameter 3 m. What is the percentage increase in the surface area of the smaller spheres over that of the large sphere?
- A. 200% B. 400% C. 500% D. can't be determined
9. A hemispherical basin 150 cm in diameter holds water one hundred and twenty times as much a cylindrical tube. If the height of the tube is 15 cm, then the diameter of the tube (in cm) is:
- A. 23 B. 24 C. 25 D. 26
10. The total number of spherical bullets, each of diameter 5 decimetre that can be made by utilizing the maximum of a rectangular block of lead with 11 metre length, 10 metre breadth and 5 metre width is
- A. 8800 B. 8500 C. 8400 D. 90
11. 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
12. The calendar for the year 2007 will be the same for the year:
- A. 2014 B. 2016 C. 2017 D. 2018
13. Which year will have the same Calendar as that of 2002?
- A. 2008 B. 2011 C. 2009 D. 2013
14. Which year will have the same calendar as that of 2008?
- A. 2014 B. 2024 C. 2032 D. 2036
15. Which among the following years is a leap year?
- A. 2600 B. 2700 C. 2800 D. 3000
16. How many days are there in x weeks x days?
- A.  $7x^2$  B.  $8x$  C.  $14x$  D. 7

17. An accurate clock shows 8 o'clock in the morning. Through how many degrees will the hour hand rotate when the clock shows 2 o'clock in the afternoon?

A.  $144^\circ$  B.  $150^\circ$  C.  $168^\circ$  D.  $180^\circ$

18. The reflex angle between the hands of a clock at 10.25 is

A.  $180^\circ$  B.  $192.5^\circ$  C.  $195^\circ$  D.  $197.5^\circ$

19. At what angle are the hands of a clock inclined at 20 minutes past 7?

A.  $80^\circ$  B.  $90^\circ$  C.  $100^\circ$  D.  $120^\circ$

20. At what angle are the hands of a clock inclined at 4 hours 20 minutes?

A.  $5^\circ$  B.  $10^\circ$  C.  $20^\circ$  D.  $25^\circ$

21. How many degrees will the minute-hand move in the same time in which the second hand moves  $300^\circ$ ?

A.  $6^\circ$  B.  $5^\circ$  C.  $4^\circ$  D.  $10^\circ$

22. A clock is started at noon. By 10 minutes past 5, the hour hand has turned through:

A.  $145^\circ$  B.  $155^\circ$  C.  $158^\circ$  D.  $160^\circ$

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. 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 the 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

## UNIT 5

### Heights and Distance

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

$$\sin\theta = \text{Perpendicular/Hypotenuse.}$$

$$\cos\theta = \text{Base/Hypotenuse}$$

$$\tan\theta = \text{Perpendicular/Base}$$

Here,  $\theta$  is either the angle of elevation or depression.

#### Terms Related to Height and Distance

- 1) Line of Sight: It is the straight line that is drawn from the eye of an observer to the point of an object which is to be viewed.
- 2) Horizontal Level: It is the horizontal line drawn from the eye of the viewer.
- 3) The angle of elevation: It is the angle formed between the line of sight and horizontal level if the object is above the horizontal level.
- 4) The Angle of Depression: It is the angle formed between the line of sight and the horizontal level if the object is below the horizontal level.
- 5) Pythagorean Theorem

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

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

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

$$\text{Then, } a^2 + b^2 = c^2.$$

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

	$0^\circ$	$30^\circ$	$45^\circ$	$60^\circ$	$90^\circ$
$\sin(\theta)$	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
$\cos(\theta)$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
$\tan(\theta)$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	undefined



### Practice Problems

1. Find the angle of elevation of the sun when the shadow of a pole of 18 m height is  $6\sqrt{3}$  m long?  
A.  $30^\circ$  B.  $60^\circ$  C.  $45^\circ$  D. None of these
2. The angle of elevation of the sun, when the length of the shadow of a tree is  $\sqrt{3}$  times the height of tree, is:  
A. 30 degree B. 45 degree C. 60 degree D. 9 degree
3. The angle of elevation of a ladder leaning against a wall is  $60^\circ$  and the foot of the ladder is 4.6 m away from the wall. The length of the ladder is?  
A. 2.3 m B. 4.6 m C. 7.8 m D. 9.2 m
4. The angle of elevation of the sun, when the length of the shadow of a tree is equal to the height of the tree, is:  
A.  $30^\circ$  B.  $45^\circ$  C.  $60^\circ$  D. None of these
5. The angle of elevation of a ladder leaning against a wall is  $60^\circ$  and the foot of the ladder is 12.4m away from the wall. The length of the ladder is:  
A. 14.8 m B. 6.2 m C. 12.4 m D. 24.8 m
6. A ladder 10 m long just reaches the top of a wall and makes an angle of  $60^\circ$  with the wall. Find the distance of the foot of the ladder from the wall ( $\sqrt{3}=1.73$ ).  
A. 4.32 m B. 17.3 m C. 5 m D. 8.65 m
7. From a point P on a level ground, the angle of elevation of the top of a tower is 30 degrees. If the tower is 100 m high, the distance of point P from the foot of the tower is:  
A. 149 m B. 156 m C. 173 m D. 200 m
8. From a point 20 m away from the foot of a tower, the angle of elevation of the top of the tower is  $30^\circ$ . The height of the tower is:  
A.  $10\sqrt{3}$  m B.  $20\sqrt{3}$  m C.  $10/\sqrt{3}$  m D.  $20\sqrt{3}/3$  m
9. An observer 1.6 m tall is  $20\sqrt{3}$  away from a tower. The angle of elevation from his eye to the top of the tower is  $30^\circ$ . The heights of the tower is:  
A. 21.6 m B. 23.2 m C. 24.72 m D. None of these
10. From a tower of 80 m high, the angle of depression of a bus is  $30^\circ$ . How far is the bus from the tower?  
A. 40 m B. 138.5 m C. 46.24 m D. 160 m
11. The thread of a kite is 120 m long and it is making  $30^\circ$  angular elevation with the ground .What is the height of the kite?  
A. 60 m B. 20 m C. 40 m D. 10 m
12. The shadow of a building is 20 m long when the angle of elevation of the sun is  $60^\circ$ . Find the height of the building.  
A. 34.64 m B. 38.64 m C. 42.64 m D. 49.64 m

13. A tower is  $100\sqrt{3}$  metres high. Find the angle of elevation of its top from a point 100 metres away from its foot.  
A.  $50^\circ$  B.  $40^\circ$  C.  $80^\circ$  D.  $60^\circ$
14. An observer 2 m tall is  $10\sqrt{3}$  m away from a tower. The angle of elevation from his eye to the top of the tower is  $30^\circ$ . The height of the tower is:  
A. 10 m B. 12 m C. 14 m D. 16 m
15. When the sun's altitude changes from  $30^\circ$  to  $60^\circ$ , the length of the shadow of a tower decreases by 70m. What is the height of the tower?  
A. 55.6 m B. 60.6 m C. 65.6 m D. 70.6 m
16. A car is moving at uniform speed towards a tower. It takes 15 minutes for the angle of depression from the top of tower to the car to change from  $30^\circ$  to  $60^\circ$ . What time after this, the car will reach the base of the tower?  
A. 6 min B. 6.5 min C. 7 min D. 7.5 min
17. The angle of elevation of the top of a tower from a certain point is  $30^\circ$ . If the observer moves 40m towards the tower, the angle of elevation of the top of the tower increases by  $15^\circ$ . The height is:  
A. 44.6 m B. 54.6 m C. 64.6 m D. 74.6 m
18. The altitude of the sun at any instant is  $60^\circ$ . Find the height of the vertical pole that will cast a shadow of 30 m.  
A.  $10\sqrt{3}$  m B.  $20\sqrt{3}$  m C.  $30\sqrt{3}$  m D.  $40\sqrt{3}$  m
19. A vertical toy 18 cm long casts a shadow 8 cm long on the ground. At the same time a pole casts a shadow 48 m. long on the ground. Then find the height of the pole?  
A. 1080 cm B. 180 m C. 108 m D. 118 cm
20. A flagstaff 17.5 m high casts a shadow of length 40.25 m. What will be the height of a building which casts a shadow of length 28.75 m under similar conditions?  
A. 14 cm B. 13.5 cm C. 12.5 cm D. 11.4 cm
21. If the angle of elevation of the sun changes from  $30^\circ$  to  $45^\circ$ , the length of the shadow of a pillar decreases by 20 meters. The height of the pillar is:  
A.  $20(\sqrt{3}-1)$  m B.  $20(\sqrt{3}+1)$  m C.  $10(\sqrt{3}-1)$  m D.  $10(\sqrt{3}+1)$
22. The shadow of the tower becomes 60 meters longer when the altitude of the sun changes from  $45^\circ$  to  $30^\circ$ . Then the height of the tower is:  
A.  $20(\sqrt{3}+1)$  m B.  $24(\sqrt{3}+1)$  m C.  $30(\sqrt{3}+1)$  m D.  $30(\sqrt{3}-1)$  m
23. On the same side of a tower, two objects are located. Observed from the top of the tower, their angles of depression are  $45^\circ$  and  $60^\circ$ . If the height of the tower is 600 m, the distance between the objects is approximately equal to:  
A. 272 m B. 284 m C. 288 m D. 254 m

24. The angle of elevation of the top of a lighthouse 60 m high, from two points on the ground on its opposite sides are  $45^\circ$  and  $60^\circ$ . What is the distance between these two points?

A. 45 m B. 30 m C. 103.8 m D. 94.6 m

25. The angle of elevation of the top of a tower from a point A on the ground is  $30^\circ$ . On moving a distance of 20 metres towards the foot the tower to a point B, the angle of elevation increases to  $60^\circ$ . The height of the tower is:

A.  $\sqrt{3}$  m B.  $5\sqrt{3}$  m C.  $10\sqrt{3}$  m D.  $20\sqrt{3}$  m

26. A vertical post 15 ft. high is broken at a certain height and its upper part, not completely separated meets the ground angle of  $30^\circ$ . Find the height at which the post is broken.

A. 10 ft. B. 5 ft. C.  $15\sqrt{3}$  (2- $\sqrt{3}$ ) ft. D.  $5\sqrt{3}$  ft.

27. A man standing at a point P is watching the top of a tower, which makes an angle of elevation of  $30^\circ$  with the man eye. The man walks some distance towards the tower to watch its top and the angle of the elevation becomes  $60^\circ$ . What is the distance between the base of the tower and the point P?

A. Data inadequate B. 8 units C. 12 units D. None of these

28. Two ships are sailing in the sea on the two sides of a lighthouse. The angle of elevation of the top of the lighthouse is observed from the ships are  $30^\circ$  and  $45^\circ$  respectively. If the lighthouse is 100 m high, the distance between the two ships is:

A. 173 m B. 200 m C. 273 m D. 300 m

29. From the top of a hill 100 m high, the angles of depression of the top and bottom of a pole are  $30^\circ$  and  $60^\circ$  respectively. What is the height of the pole?

A. 46.67 m B. 56.67 m C. 66.67 m D. None of these

30. The angle of elevation of the top of a tower from the point P and Q at distance of 'a' and 'b' respectively from the base of the tower and in the same straight line with it are complementary. The height of the tower is:

A.  $\sqrt{ab}$  B.  $a/b$  C.  $ab$  D.  $a^2 b^2$

### **Analytical Reasoning**

#### **linear arrangements:**

Directions – (Q.1– 5) Study the following information and answer the questions given below:

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

Directions – (Q.6– 10) Study the following information and answer the questions given below:

A, B, C, X, Y, Z 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

Directions – (Q.11– 15) Study the following information and answer the questions given below:

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.

11. 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

12. The family members sitting on the right of O are

- A. RML B. JQP C. QPK D. KPR (E) None of these

13. Who is sitting in the centre of the row?

- A. L B. J C. O D. Q E) None of these

14. Who are sitting next to L?

- A. J and O B. M and J C. M and O D. R and J E) M and N

15. Who is at the other end of the row?

- A. R B. J C. P D. N (E) None of these

Directions – (Q.16– 19) Study the following information and answer the questions given below:

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 neighbour of D. R sits second to the right of P. S sits second to the left of Q. B and E are immediate neighbours and E does not face P.

16. How many persons are seated between Q and T?

- A. None B. One C. Two D. Three E) None of these

17. 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) A

18. 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

19. Which of the following is true regarding B?

- A. A and C are immediate neighbours of 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

### Circular Arrangements:

Directions – (Q. 1– 5) Study the following information and answer the questions given below:

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 right 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 pair does not sitting adjacent to each other?

A. BA B. CB C. DE D. DG 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

### **Cubes and Dices**

DIRECTIONS (Qs. 1-4): Read the following information and answer the questions based on it.

(i) The length, breadth and height of a rectangular piece of wood are 4 cm, 3 cm and 5 cm respectively.

(ii) Opposite sides of 5 cm × 4 cm piece are coloured in red.

(iii) Opposite sides of 4 cm × 3 cm are coloured in blue.

(iv) Rest sides of 5 cm × 3 cm are coloured on green in both sides.

(v) Now the piece of is cut in such a way that cubes of 1 cm × 1 cm × 1 cm will be made.

1. How many cubes shall have all the three colors?

(a) 8    (b) 10

(c) 12    (d) 14

2. How many cubes shall not have any colour?

(a) No any    (b) 2

(c) 4    (d) 6

3. How many cubes shall have only two colours red and green on their two sides?

- (a) 8 (b) 12  
(c) 16 (d) 20

4. How many cubes shall have only one colour?

- (a) 12 (b) 16  
(c) 22 (d) 28

DIRECTIONS (Qs. 5 -8): A cube is coloured red on all faces. It is cut into 64 smaller cubes of equal size. Now, answer the following questions based on this statement:

5. How many cubes have no face coloured?

- (a) 24 (b) 16  
(c) 8 (d) 0

6. How many cubes are there which have only one face coloured?

- (a) 4 (b) 8  
(c) 16 (d) 24

7. How many cubes have two red opposite faces?

- (a) 0 (b) 8  
(c) 16 (d) 24

8. How many cubes have three faces coloured?

- (a) 24 (b) 16  
(c) 8 (d) 4

DIRECTIONS (QS. 9 - 11): Three adjacent face, of a cube are coloured blue. The cube is then cut (once horizontally and one vertically) to form four cuboids of equal size, each of these cuboids is coloured pink on all the uncoloured faces and is then cut (as before) into four cuboids of equal size.

9. How many cuboids have two faces coloured pink?

- (a) 1 (b) 3 (c) 4 (d) 6

10. How many cuboids have three faces coloured pink?

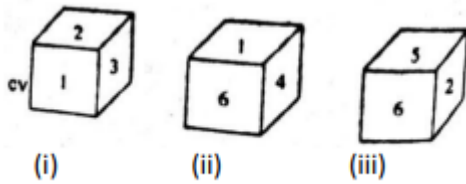
- (a) 9 (b) 7 (c) 5 (d) 3

11. How many cuboids have three faces coloured blue?

- (a) 4 (b) 2 (c) 1 (d) 0



DIRECTIONS (Qs. 12-16): Following questions are based on the figures given below which represent different positions of the same dice.



12. Which number lies at the bottom face of the dice (i)?

(a) 4 (b) 2

(c) 1 (d) 3

13. Which number lies at the bottom face of the dice (iii)?

(a) 1 (b) 2

(c) 6 (d) 4

14. Which number lies opposite 6?

(a) 2 (b) 5

(c) 3 (d) 1

15. Which of the following combinations shows the numbers at the adjacent surfaces of the number 4?

(a) 3, 2 (b) 6, 2

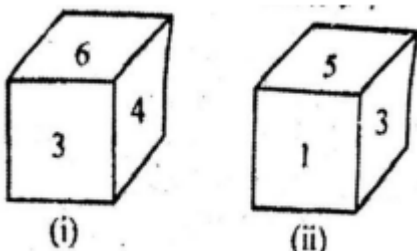
(c) 2, 3 (d) 6, 3

16. Which of the following number does not appear on any one of the adjacent surfaces of the number 3?

(a) 2 (b) 6

(c) 4 (d) 1

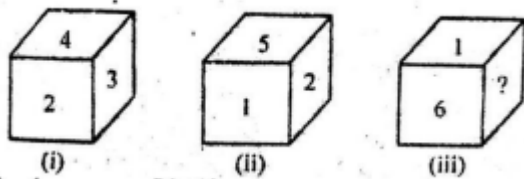
17. On the basis of two positions of dice, find what number will be on the opposite face of number 5?



(a) 1 (b) 3

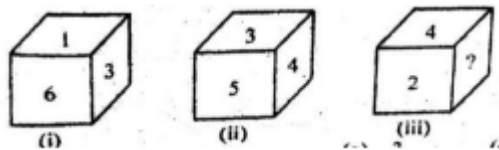
(c) 4 (d) 5

18. From the following positions of dice find which, will come in place of '?'



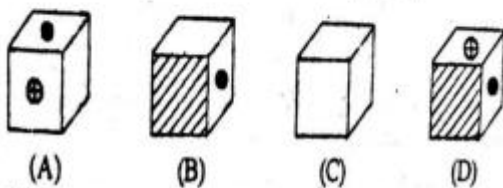
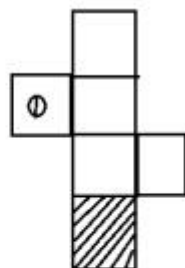
- (a) 4 (b) 5  
(c) 2 (d) 3

19. Three positions of the same dice are given below Observe the figures carefully and find which number will come in place of '?'



- (a) 1 (b) 6  
(c) 3 (d) 5

20. Select from the alternative, the box that can be formed by folding the sheet shown in figure (X):



- (a) A only (b) C only  
(c) A, C and D only (d) A, B, C and D

### Company Specific

1. The length of the shadow of a vertical tower on level ground increases by 10 metres when the altitude of the sun changes from  $45^\circ$  to  $30^\circ$ . Then the height of the tower is:

A.  $5\sqrt{3}$  m B.  $10(\sqrt{3} + 1)$  m C.  $5(\sqrt{3} + 1)$  m D.  $10\sqrt{3}$  m

2. A man standing at a point P is watching the top of a tower, which makes an angle of elevation of  $30^\circ$ . The man walks some distance towards the tower and then his angle of elevation of the top of the tower is  $60^\circ$ . If the height of tower is 30 m, then the distance he moves is:

A. 22 m B.  $22\sqrt{3}$  m C. 20 m D.  $20\sqrt{3}$  m

3. The angle of elevation of the top of a tower from a point on the ground is  $30^\circ$  and moving 70 meters towards the tower it becomes  $60^\circ$ . The height of the tower is:

A. 10 meter B.  $10/\sqrt{3}$  meter C.  $10\sqrt{3}$  meter D.  $35\sqrt{3}$  meter

4. A tree breaks and falls to the ground such that its upper part is still partially attached to its stem. At what height did it break, if the original height of the tree was 24 cm and it makes an angle of  $30^\circ$  with the ground?

A. 12 cm B. 8 cm C. 9.5 cm D. 7.5 cm

5. The top of a 15 m. high tower makes an angle of elevation of 60 degree with the bottom of an electric pole and an angle of 30 degree with the top of the pole. What is the height of the pole?

A. 12 m B. 10 m C. 11 m D. 5 m

6. From the top of a temple near a river the angles of depression of both the banks of river are  $45^\circ$  &  $30^\circ$ . If the height of the temple is 100 m then find out the width of the river.

A.  $50(\sqrt{3}-1)$ m

B.  $100(\sqrt{3}-1)$ m

C.  $200(\sqrt{3}-1)$ m

D.  $300(\sqrt{3}-1)$ m

7. A toy leaves the earth at a point A and rises vertically at uniform speed. After two minutes of vertical rise boy finds the angular elevation of the balloon as  $60^\circ$ . If the point at which boy is standing is 150 m away from point A, what is the speed of the toy?

A. .98 m/s B. 1.08 m/s C. 1.16 m/s D. 2.16 m/s

8. The angle of elevation of an aeroplane from a point on the ground is  $60^\circ$ . After 15 second flight, the elevation changes to  $30^\circ$ , If the aeroplane is flying at a height of  $1500\sqrt{3}$  m, find the speed of the plane:

A. 300 m/sec B. 200 m/sec C. 100 m/sec D. 150 m/sec

9. Two pillars of equal height are on either side of a road, which is 120m wide. The angles of elevation of the top of the pillars are  $60^\circ$  and  $30^\circ$  at a point on the road between the pillars. Find the height of the pillars.

A.  $10\sqrt{3}$  m B.  $30\sqrt{3}$  m C.  $20\sqrt{3}$  m D. None of these

10. From the top of a building 60m high, the angle of elevation and depression of the top and the foot of another building are  $\alpha$  and  $\beta$  respectively. Find the height of the second building.

- A.  $60(1 + \tan \alpha \tan \beta)$
- B.  $60(1 + \cot \alpha \tan \beta)$
- C.  $60(1 + \tan \alpha \cot \beta)$
- D.  $60(1 - \tan \alpha \cot \beta)$

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 form 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, Meenal    D. Ali, Rumia    E) Ketan

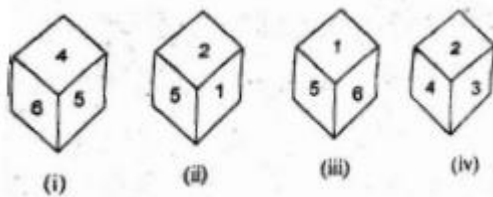
21. Who amongst the following sits exactly between Peter and Ali ?

- 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 ?

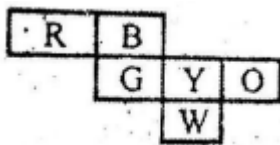
- A. Rumia    B. Ali    C. Ketan    D. Harleen    E) Shikha

23. Which number is on the face opposite to 4, if the four different positions, of a dice are as shown in the figures given below.



- (a) 5 (b) 3  
(c) 2 (d) 1

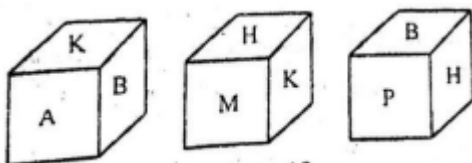
24. Six squares are coloured, front and back, red (R), blue (B), yellow (Y), green (G), white (W) and orange (O) and are hinged together as shown in the figure given below.



If they are folded to form a cube, what would be the face opposite the white face?

- (a) R (b) G  
(c) B (d) O

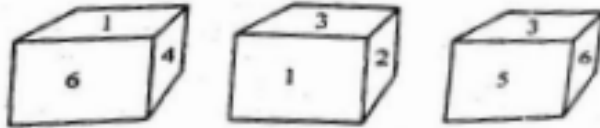
25. Three views of a cube following a particular motion are given below:



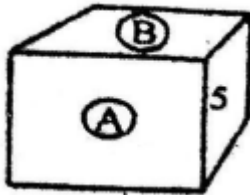
What is the letter opposite to A?

- (a) H (b) P  
(c) B (d) M

26. A cube has six numbers marked 1, 2, 3, 4, 5 and 6 on its faces. Three views of the cube are shown below:

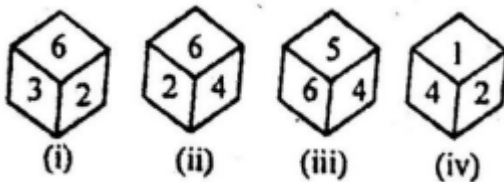


What possible numbers can exist on the two faces marked A and B, respectively on the cube?



- (a) 2 and 3 (b) 6 and 1  
(c) 1 and 4 (d) 3 and 1

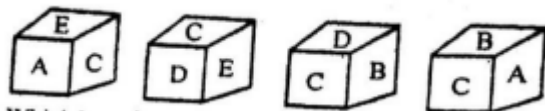
27. The four different position of dice are given below



Which number is on the face opposite of 6?

- (a) 1 (b) 2  
(c) 3 (d) 4

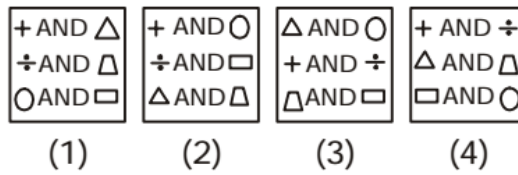
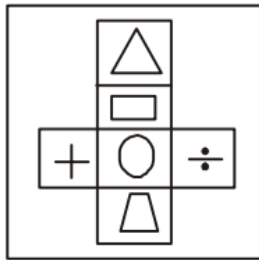
28. Which letter will be opposite of letter D ?



- (a) A (b) B (c) E (d) F

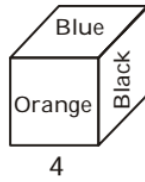
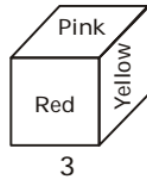
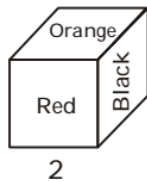
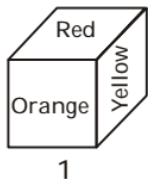
29. If a paper is folded as shown in figure to form a cube, then the pairs of opposite faces are

**Question Figure :**      **Answer Figures :**



(a) 1    (b) 2    (c) 3    (d) 4

30. A block is painted yellow, red, black, orange, pink and blue on its six sides as shown in the following four figures. In figure 3, which color will be opposite to red?

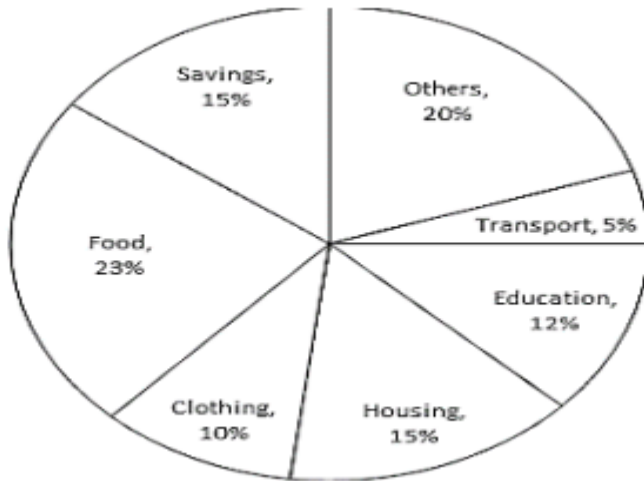


(a) Blue      (b) Orange      (c) Yellow      (d) Pink

## UNIT 6

### Data Interpretation

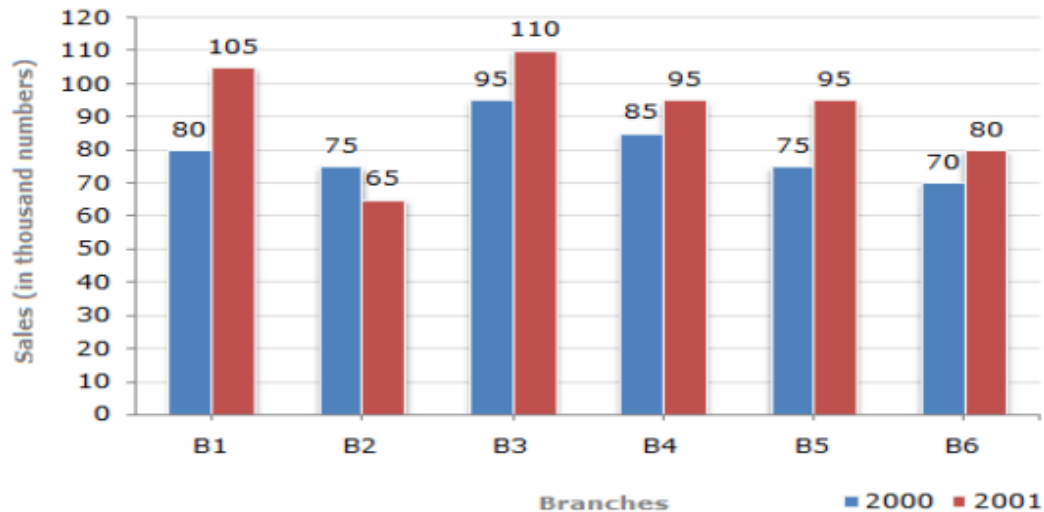
Read the following pie-chart to answer the questions given below it:



1. If the total amount spent during the year 1998 was Rs. 46000/-, the amount spent on food, was:  
A. Rs. 2000/- B. Rs. 10580/- C. Rs. 23000/- D. Rs. 2300/-
2. If the total amount spent was Rs. 46000/-, how much was spent on clothing and housing together?  
A. Rs. 11500/- B. Rs. 1150/- C. Rs. 10000/- D. Rs. 15000/-
3. The ratio of the total amount of money spent on housing to that spent on education was:  
A. 5 : 2 B. 2 : 5 C. 4 : 5 D. 5 : 4
4. Graph shows that the maximum amount was spent on:  
A. Food B. Housing C. Clothing D. Others
5. If the total expenditure of the family for the year 1998 was Rs. 46000/-, the family saved during the year.  
A. Rs. 1500/- B. Rs. 15000/- C. Rs. 6900/- D. Rs. 3067/- approx.

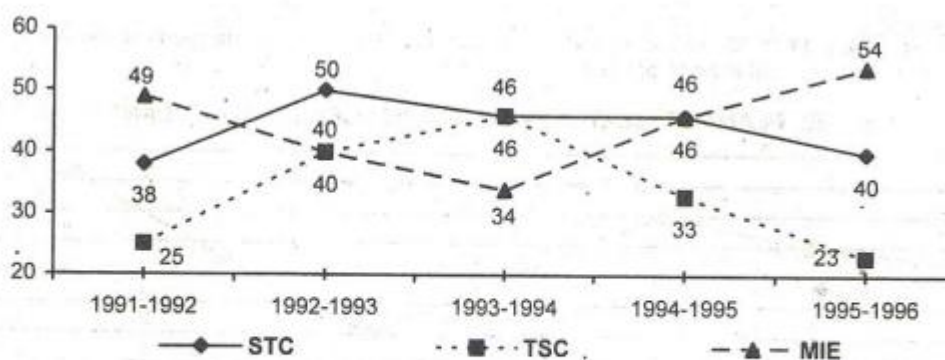


Direction(6-10): The bar graph given below shows the sales of books (in thousand number) from six branches of a publishing company during two consecutive years 2000 and 2001. Sales of Books (in thousand numbers) from Six Branches - B1, B2, B3, B4, B5 and B6 of a publishing Company in 2000 and 2001.



6. What is the ratio of the total sales of branch B2 for both years to the total sales of branch B4 for both years?  
A. 2:3 B.3:5 C.4:5 D.7:9
7. Total sales of branch B6 for both the years is what percent of the total sales of branches B3 for both the years?  
A. 68.54% B.71.11% C.73.17% D.75.55%
8. What percent of the average sales of branches B1, B2 and B3 in 2001 is the average sales of branches B1, B3 and B6 in 2000?  
A.75% B. 77.5% C. 82.5% D. 87.5%
9. What is the average sales of all the branches (in thousand numbers) for the year 2000?  
A. 73 B. 80 C. 83 D. 88
10. Total sales of branches B1, B3 and B5 together for both the years (in thousand numbers) is?  
A. 250 ( B) 310 C. 435 D. 560

Directions for 11 to 15: These questions are based on the line graph given below which represents the Earnings Per Share (EPS) of three companies STC, TSC and MIE for the years 1991-1992 to 1995-1996. (EPS in Rs.)



$$EPS = \frac{\text{Profit available for Shareholders}}{\text{Number of Shares}}$$

11. If TSC has 15, 000 shares in 1994-1995 and 31, 000 shares in 1995-1996, then find the approximate percentage change in profit available for shareholders from 1994- 1995 to 1995-1996.

A. 35% B. 59.6% C. 44.1% D. 61%

12. If the number of shares of TSC in 1993-1994 is the same as in 1994-1995, then which of the following is true.

A. Ratio of EPS for both these years is the same as that of the profit available from shareholders. B. Profit available for shareholders for these two years is the same. C. Ratio of EPS for these two years is half that of the profit available for the share holders. D. Both (1) and (2)

13. If TSC, STC and MIE have 10, 000, 25, 000 and 15, 000 shares respectively in 1991-1992, then which company has the maximum profit available for shareholders in that year?

A. TSC B. STC C. MIE D. STC and TSC

14. If TSC and STC have Rs. 6 lacs each as profit available for shareholders in 92-93, then the ratio of the number of shares of STC and TSC is

A. 1 : 1 B. 4 : 5 C. 5 : 4 D. 20 : 12

15. If STC has to pay 10% of the profit available for share-holders as tax in the year 1993-1994, then the tax payable for 12, 000 shares is

A. Rs. 62, 200 B. Rs. 55, 200 C. Rs. 60, 000 D. Rs. 50, 000

Directions (Q16 to Q20): Study the following table and answer the questions based on it

**Expenditures of a Company (in Lakh Rupees) per Annum Over the given Years.**

Year	Item of Expenditure				
	Salary	Fuel and Transport	Bonus	Interest on Loans	Taxes
1998	288	98	3.00	23.4	83
1999	342	112	2.52	32.5	108
2000	324	101	3.84	41.6	74
2001	336	133	3.68	36.4	88
2002	420	142	3.96	49.4	98

16. What is the average amount of interest per year which the company had to pay during this period?  
 (a) 32.43 Lakhs (b) 33.43 Lakhs (c) 34.12 Lakhs (d) 36.66 Lakhs
17. The total amount of bonus paid by the company during the given period is approximately what percent of the total amount of salary paid during this period?  
 (a) 0.1 % (b) 0.25 % (c) 1% (d) 1.25%
18. Total expenditure on all these items in 1998 was approximately what percent of the total expenditure in 2002?  
 (a) 62% (b) 66% (c) 69% (d) 71%
19. The total expenditure of the company over these items during the year 2000 is?  
 (a) 544.44 Lakhs (b) 546.44 Lakhs (c) 578.44 Lakhs (d) 560 Lakhs
20. The ratio between the total expenditure on Taxes for all the years and the total expenditure on Fuel and Transport for all the years respectively is approximately?  
 (a) 4:7 (b) 10:13 (c) 15:18 (d) 5:8

### Data Sufficiency

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 neighbour of D.

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 Peter, Kevin, Joseph and Jason ?

I. Jason is older than Peter and Joseph.

II. Kevin is younger than Joseph.

### **Company specific**

Directions for data sufficiency questions (1-14):

- 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

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 an immediate neighbour of either P or Q.

6. Which direction is Kartik facing at the moment?

I. After walking 4 meters early morning from point A, Kartik is facing the opposite direction the sun.

II. Kartik 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 the right of C. C faces the centre. E sits second to the right of A and C sits second to the left of D.

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 90 degree 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.

Directions for data sufficiency questions (15):

a) I and III are sufficient to answer the question

b) All I, II and III are required to answer the question.

c) II and III are sufficient to answer the question.

d) Question cannot be answered even with statements I, II and III together.

e) I and II are sufficient to answer the question.

15. How many daughters does W have ?

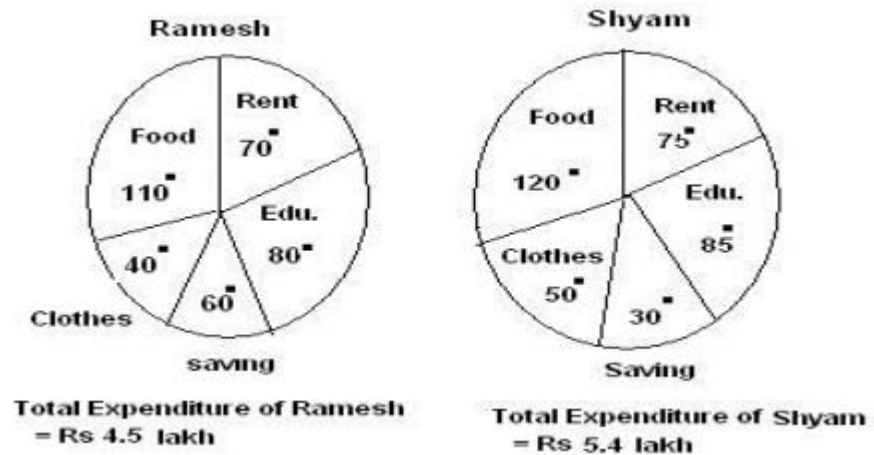
I. B and D are sisters of M.

II. M's father T is husband of W.

III. Out of the three children which T has only one is a boy

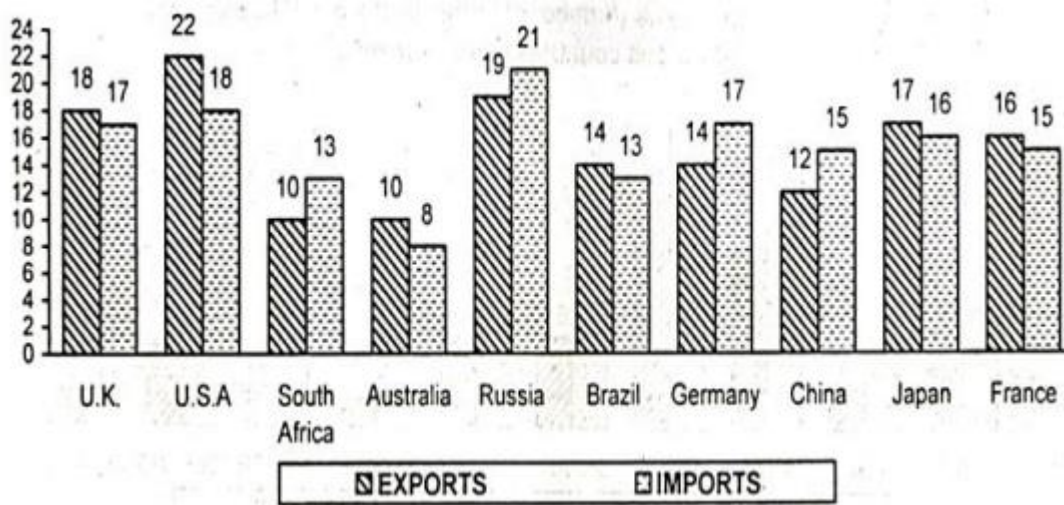


Directions for Question 16-20 : Following pie charts show the distribution of annual expenditure of two persons Ramesh and Shyam. Answer the following questions based on these charts. Total expenditure of Ramesh and Shyam is Rs 4.5 and 5.4 lakhs respectively.



16. What is the amount Ramesh and Shyam save yearly?  
A. 1.25 lakhs B. 1.20 lakhs C. 1.15 lakhs D. 1.10 lakhs
17. What is the ratio of the amount spent on clothes by Ramesh than that of Shyam?  
A. 4:5 B. 3:5 C. 2:3 D. 3:4
18. Money spent by Shyam on food is what percentage of the money spent by Ramesh on education?  
A. 180% B. 100% C. 120% D. 150%
19. What is the average of the amount spent for house rent by Ramesh and Shyam?  
A. 0.75 lakhs B. 0.84 lakhs C. 1 lakhs D. 1.2 lakhs
20. Money spent by Shyam on education is how much percentage more than that of money spent by Ramesh on education?  
A. 20% B. 22.5% C. 25% D. 27.5%

These questions are based on the following graph. The Country wise break up Exports/Import of Country 'XYZ' in 1996 (in Rs. thousand crores)



Trade Surplus = Exports – Imports; Trade Deficit = Imports – Exports

21. The cumulative trade deficit of country XYZ is approximately what percent of its average imports from each of the above-mentioned countries?

A. 65% B. 9% C. 6.5% D. 0.6%

22. If the average cost of exports is Rs. 2000 per ton and that of imports of Rs. 3000 per ton, then by what percent is the total tonnage of exports more/less than the total tonnage of imports

A. 33.3% more B. 49% less C. 32.8 % more/less D. 49% more

23. By what percentage are the imports from the country to which the exports are the highest more than the exports to the country from which the imports are the least?

A. 175% B. 80% C. 55.55% D. 125%

24. Which of the following statements is definitely true?

A. Country XYZ has a cumulative trade surplus of Rs. 1 crore

B. The cumulative trade deficit of country XYZ is approximately one-fifteenth of its total imports.

C. The trade deficit of country XYZ considering its trade with China alone is 300% more than its cumulative trade deficit/surplus.

D. The difference between the highest exports to any country and the lowest import from any country is equal to the average of the exports to Brazil and Germany.

25. What is the ratio of the total imports from Brazil, Japan, South Africa, Russia and China to the total exports to the other five countries?

A. 0.975 B. 1.026 C. 0.96 D. None of these

**ANSWER KEY****Unit - 1****Topic: Time and Work**

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	C	9	B	17	B	25	C	33	C
2	D	10	C	18	B	26	B	34	B
3	B	11	A	19	B	27	D	35	D
4	C	12	C	20	D	28	B	36	D
5	D	13	B	21	A	29	D	37	A
6	D	14	C	22	C	30	B	38	B
7	B	15	D	23	C	31	A	39	C
8	B	16	B	24	B	32	D	40	B

**Topic: Company Specific**

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	A	5	B	9	C	13	A	17	A
2	D	6	D	10	C	14	A	18	C
3	B	7	B	11	C	15	C	19	B
4	D	8	B	12	A	16	D	20	B

**Unit - 2****Topic: Time Speed and Distance**

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	A	2	D	3	B	4	D	5	B
6	A	7	B	8	B	9	B	10	B
11	B	12	C	13	B	14	A	15	C
16	D	17	B	18	A	19	C	20	A
21	D	22	C	23	C	24	A	25	B
26	D	27	D	28	B	29	C	30	B
31	C	32	D	33	A	34	A	35	D
36	B	37	A	38	B	39	A	40	B
41	C	42	D	43	D	44		45	

**Topic: Time Speed and Distance - Company Specific**

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	C	2	A	3	A	4	B	5	B
6	A	7	D	8	A	9	A	10	A
11	A	12	A	13	A	14	D	15	B
16	B	17	A	18	C	19	C	20	A

**Unit - 3****Topic: Syllogism**

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	D	2	C	3	D	4	C	5	D
6	D	7	C	8	D	9	B	10	A
11	D	12	C	13	B	14	D	15	B
16	D	17	C	18	D	19	D	20	C
21	B	22	D	23	B	24	A	25	D

Topic: RANKING TEST									
Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	A	2	B	3	D	4	B	5	D
6	A	7	C	8	D	9	A	10	B
11	D	12	D	13	B	14	B	15	C
16	C	17	C	18	D	19	D	20	B
21	C	22	B	23	A	24	C	25	B
Topic: Venn Diagram									
Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	b	2	c	3	d	4	b	5	c
6	c	7	b	8	c	9	b	10	c
11	a	12	d	13	a	14	c	15	
Topic: Company specific									
Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	a	2	c	3	b	4	d	5	b
6	d	7	d	8	a	9	c	10	d
11	d	12	d	13	d	14	c	15	b
16	e	17	d	18	a	19	c	20	e
Unit - 4									
Topic: Mensuration									
Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	A	2	B	3	B	4	B	5	D
6	A	7	C	8	B	9	A	10	C
11	D	12	B	13	A	14	D	15	C
16	D	17	C	18	A	19	A	20	C
21	A	22	A	23	D	24	C	25	B
26	D	27	C	28	D	29	C	30	C
Topic: Calendar									
Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	B	2	A	3	D	4	A	5	C
6	D	7	C	8	C	9	C	10	A
11	C	12	D	13	B	14	C	15	A
16	D	17	D	18	D	19	B	20	C
21	B	22	B	23	B	24	D	25	A
26	C	27	B	28	A	29	C	30	A
Topic: Clock									
Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	A	2	B	3	D	4	B	5	D
6	A	7	A	8	A	9	A	10	B
11	A	12	D	13	C	14	B	15	D
16	A	17	C	18	B	19	D	20	A
Topic: Company specific									
Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	A	2	B	3	C	4	D	5	C
6	C	7	B	8	B	9	C	10	C

11	A	12	D	13	D	14	D	15	C
16	B	17	D	18	D	19	C	20	B
21	B	22	B	23	A	24	B	25	B

### Unit - 5

#### Topic: (Height and Distance)

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

#### Topic: Analytical Reasoning (Linear Arrangement)

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	C	2	B	3	C	4	B	5	A
6	D	7	D	8	C	9	A	10	B
11	A	12	C	13	B	14	A	15	D
16	C	17	B	18	D	19	D		

#### Topic: Analytical Reasoning (Circular Arrangement)

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	B	2	C	3	D	4	A	5	A
6	A	7	E	8	D	9	D	10	C
11	A	12	A	13	B	14	C	15	A
16	C								

#### Topic: Cubes and Dices

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	A	2	D	3	B	4	C	5	C
6	D	7	A	8	C	9	D	10	B
11	C	12	A	13	A	14	C	15	D
16	B	17	C	18	D	19	A	20	B

#### Topic: Company Specific

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

### Unit - 6

#### Topic: Data Interpretation

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	B	2	A	3	D	4	A	5	C
6	D	7	C	8	D	9	B	10	D
11	A	12	A	13	B	14	B	15	A
16	D	17	C	18	C	19	A	20	B

**Topic: Data Sufficiency**

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	A	2	D	3	D	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	B	18	C	19	E	20	E

**Topic: Company Specific**

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	A	2	D	3	E	4	E	5	E
6	A	7	D	8	D	9	C	10	E
11	C	12	C	13	C	14	D	15	C
16	B	17	C	18	A	19	C	20	D
21	C	22	D	23	B	24	C	25	D