18. (*e*) : Sociology precedes Mechanics.

19. (*a*) : There is only one day gap between Philosophy and Science.

20. (*d*) : Economics is followed by Science.

Questions 21 to 23

E should be immediately followed by C *i.e.* the order EC should be followed.

D should be immediately followed by B *i.e.* the order DB should be followed.

One play is staged between A and B and D or E should not be the first or last play.

So, the order is :

Monday	Tuesday	Wednesday	Thursday	Friday
A	D	B	E	C

21. (*a*) : A is the first play to be staged.

22. (*e*) : The correct order is A D B E C.

23. (*b*) : B was staged on Wednesday.

Questions 24 to 28

24. (*a*) : Clearly, she visits M before N and N before Q. So, she must visit M before Q.

25. (*a*) : Of the six companies if S is first, P is third and the orders M N Q and M R are followed. Clearly, M must be visited second.

26. (*e*) : Since P is at third place and orders M, N, Q and M, R are to be followed, so immediately after P she can visit any company except M and which may occupy first or second place because Q, R and N cannot precede it.

27. (*d*) : If Q is visited just before R and immediately after S, the order followed will be M N S Q R. Since P must be in 3rd place, so we have M N P S Q R *i.e.*, Q will be visited fifth.

28. (*a*) : According to information, P must be in third place and the order M, N and Q must not be violated. This is followed only in the arrangement M S P N R Q.

TYPE 5 : SELECTION BASED ON GIVEN CONDITIONS

In such type of questions, a few essential criteria for selection of a group of items are given. The candidate has to keep these conditions in mind and make the required selection as per the directions given in each question.

Ex. 1. ***Study the following information carefully and answer the questions given below it :***

From amongst six boys A, B, C, D, E and F and five girls P, Q, R, S and T, a team of six is to be selected under the following conditions :

(*i*) A and D have to be together.

(*ii*) C cannot go with S.

(*iii*) S and T have to be together.

(*iv*) B cannot be teamed with E.

(*v*) D cannot go with P.

(*vi*) B and R have to be together.

(*vii*) C and Q have to be together.

1. If there be five boys in the team, the lone girl member is :

(*a*) P (*b*) Q (*c*) R (*d*) S

2. If including P, the team has three girls, the members are :

(*a*) B C F Q R (*b*) A D E S T (*c*) A D B S T (*d*) B F R S T

3. If the team including C consists of four boys, the members of the team other than C are :
   (*a*) A D E P Q (*b*) A B D Q R (*c*) D E F A Q (*d*) B E F R Q
4. If four members including E have to be boys, the members other than E are :
   (*a*) A B C Q R (*b*) A D F S T (*c*) B C F Q R (*d*) A C D F Q
5. If four members have to be girls, the members of the team are :
   (*a*) B C P Q R S (*b*) B F P R S T (*c*) B C Q R S T (*d*) B C P Q R T

Solution : The given questions may be handled as under :

1. In a team of six if five boys are to be selected then both A and D together are selected. If C is selected, a girl Q will be selected.
   From B and E, one has to be selected. So, we select E because B will be accompanied by a girl. The fifth boy will be F. So, the only girl will be Q in the team A C D E F Q. Hence, the answer is (*b*).
2. If P is included, D and hence A cannot be included. If Q is selected, C has to be selected and so S cannot be selected. T goes with S. So, T is also not selected. The third girl can be R. With R, B will be selected but with B, E cannot be selected. So, the sixth member can be F only. *i.e.*, the team becomes P Q C R B F. So, the answer is (*a*).
3. If team contains C, Q will be included. If another girl included is R, B will be there and hence E cannot be there. A and D have to be together. So, they are also included and only F can be excluded. Thus, the team is C Q R B A D. So, the answer is (*b*).
4. If E is included, B cannot be included. A and D have to be together. So, they are both included. Without B, R will not be there. With D, P cannot be there. So, two girls together can be only S and T. If S is there, C cannot be there. So the fourth boy can be F alone. Thus, the team becomes E A D S T F. So, the answer is (*b*).
5. In four girls, S and I are taken together. With S, C cannot be there. So, Q will not be there. If P is included, D and hence A cannot be there. If R is included, B will be there and hence E cannot be there. So, only F can be there. Thus, the team is S T P R B F. So, the answer is (*b*).

EXERCISE 6E

Directions (*Questions 1 to 5*) : *Study the following information carefully and answer the questions that follow :* **(Hotel Management, 1996)**

A team of five is to be selected from amongst five boys A, B, C, D and E and four girls P, Q, R and S. Some criteria for selection are :

A and S have to be together.
P cannot be put with R.
D and Q cannot go together.
C and E have to be together.
R cannot be put with B.

Unless otherwise stated, these criteria are applicable to all the questions below :

1. If two of the members have to be boys, the team will consist of :
   (*a*) A B S P Q (*b*) A D S Q R (*c*) B D S R Q (*d*) C E S P Q
2. If R be one of the members, the other members of the team are :
   (*a*) P S A D (*b*) Q S A D (*c*) Q S C E (*d*) S A C E
3. If two of the members are girls and D is one of the members, the members of the team other than D are :
   (*a*) P Q B C (*b*) P Q C E (*c*) P S A B (*d*) P S C E

4. If A and C are members, the other members of the team cannot be :
(*a*) B E S (*b*) D E S (*c*) E S P (*d*) P Q E

5. If including P at least three members are girls, the members of the team other than P are :
(*a*) Q S A B (*b*) Q S B D (*c*) Q S C E (*d*) R S A D

Directions (*Questions 6 to 10*) : *Read the following information carefully and answer the questions given below it :*

There are five men A, B, C, D and E and six women P, Q, R, S, T and U. A, B and R are advocates; C, D, P, Q and S are doctors and the rest are teachers. Some teams are to be selected from amongst these eleven persons subject to the following conditions :

A, P and U have to be together.
B cannot go with D or R.
E and Q have to be together.
C and T have to be together.
D and P cannot go together.
C cannot go with Q.

6. If the team is to consist of two male advocates, two lady doctors and one teacher, the members of the team are :
(*a*) A B P Q U (*b*) A B P U S (*c*) A P R S U (*d*) B E Q R S

7. If the team is to consist of one advocate, two doctors, three teachers and C may not go with T, the members of the team are :
(*a*) A E P Q S U (*b*) A E P Q T U (*c*) B E Q S T U (*d*) E Q R S T U

8. If the team is to consist of one male advocate, one male doctor, one lady doctor and two teachers, the members of the team are :
(*a*) A C P T U (*b*) A D E P T (*c*) A D E P U (*d*) B C E Q U

9. If the team is to consist of one advocate, three doctors and one male teacher, the members of the team are :
(*a*) A D P S U (*b*) C D R S T (*c*) D E Q R S (*d*) D E Q R T

10. If the team is to consist of two advocates, two doctors, two teachers and not more than three ladies, the members of the team are :
(*a*) A B C P T U (*b*) A C P R T U (*c*) A E P Q R T (*d*) B C E Q R T

Directions (*Questions 11 to 15*) : *Study the following information carefully and answer the questions that follow :* **(L.I.C.A.A.O. 1995)**

From amongst five doctors A, B, C, D and E, four engineers G, H, K and L and six teachers M, N, O, P, Q and R, some teams are to be selected. Of these, A, B, G, H, O, P and Q are females and the rest are males.

The formation of teams is subject to the following conditions :
Wherever there is a male doctor, there will be no female teacher.
Wherever there is a male engineer, there will be no female doctor.
There shall not be more than two male teachers in any team.

11. If the team consists of two doctors, three female teachers and two engineers, the members of the team are :
(*a*) A B O P Q G H (*b*) C D K L O P Q
(*c*) C D O P Q G H (*d*) D E G H O P Q

12. If the team consists of two doctors, one engineer and four teachers, all the following teams are possible except :

(*a*) A B G M N O P (*b*) A B H M O P Q
(*c*) A B H M R P Q (*d*) A B K N R P Q

13. If the team consists of two doctors, two female teachers and two engineers, all the following teams are possible except :

(*a*) A B G H O Q (*b*) A B G H P Q
(*c*) A B K L P Q (*d*) O P G H A B

14. If the team consists of three doctors, two male engineers and two teachers, the members of the team could be :

(*a*) A B C K L M R (*b*) B C D K L N R
(*c*) C D E K L M N (*d*) C D E K L P R

15. If the team consists of two doctors, two engineers and two teachers, all the following teams are possible except :

(*a*) A B G H O P (*b*) A B G H M N
(*c*) C E K L N R (*d*) C D K L O P

Directions (*Questions 16 to 18*) : *Read the following information carefully and answer the questions given below it :* **(Bank P.O. 1996)**

Eight students A, B, C, D, E, F, G and H are planning to enjoy car racing. There are only two cars and following are the conditions :

(*i*) One car can accommodate maximum five and minimum four students.
(*ii*) A will sit in the same car in which D is sitting but H is not in the same car.
(*iii*) B and C can't sit in the same car in which D is sitting.
(*iv*) F will sit in the car of four people only alongwith A and E but certainly not with G.

16. If H and G are sitting in the same car, who are other two students sitting in the same car ?

(*a*) B and C (*b*) C and D (*c*) B and D
(*d*) E and B (*e*) None of these

17. If E and A are sitting in the same car, which of the following statements is true ?

(*a*) Five students are sitting in the same car.
(*b*) B is sitting in the same car.
(*c*) F is not sitting in the same car.
(*d*) G is not sitting in the same car.
(*e*) None of these

18. Which of the following statements is superfluous for the above sitting arrangements ?

(*a*) Only (*i*) (*b*) Only (*ii*) (*c*) Only (*iii*)
(*d*) Only (*iv*) (*e*) None of these

Directions (*Questions 19 to 23*) : *Study the following information carefully and answer the questions that follow :* **(NABARD, 1994)**

At an Electronic Data Processing Unit, five out of the eight program sets P, Q, R, S, T, U, V and W are to be operated daily. On any one day, except for the first day of a month, only three of the program sets must be the ones that were operated on the previous day. The program operating must also satisfy the following conditions :

(*i*) If program P is to be operated on a day, V cannot be operated on that day.

(*ii*) If Q is to be operated on a day, T must be one of the programs to be operated after Q.

(*iii*) If R is to be operated on a day, V must be one of the programs to be operated after R.

(*iv*) The last program to be operated on any day must be either S or U.

19. Which of the following could be the set of programs to be operated on the first day of a month ?

(*a*) V, Q, R, T, S (*b*) U, Q, S, T, W (*c*) T, U, R, V, S

(*d*) Q, S, R, V, U (*e*) P, R, V, S, U

20. Which of the following is true of any day's valid program set operation ?

(*a*) P cannot be operated at third place.

(*b*) Q cannot be operated at third place.

(*c*) R cannot be operated at fourth place.

(*d*) T cannot be operated at third place.

(*e*) U cannot be operated at fourth place.

21. If R is operated at third place in a sequence, which of the following cannot be the second program in that sequence ?

(*a*) Q (*b*) S (*c*) T (*d*) U (*e*) W

22. If the program sets R and W are to be operated on the first day, which of the following could be the other programs on that day ?

(*a*) P, T, V (*b*) Q, S, V (*c*) Q, T, V (*d*) T, S, U (*e*) T, S, V

23. If the program sets operated on a day is P, Q, W, T, U, each of the following could be the next day's program set except :

(*a*) W, T, U, V, S (*b*) W, T, S, P, U (*c*) W, R, V, T, U

(*d*) Q, T, V, W, S (*e*) Q, R, V, T, U

ANSWERS

1. (*a*) : If A is selected, S has to be selected.
If B is selected, R cannot be selected.
If D is selected, Q cannot be selected.
So, A D S Q R and B D S R Q are wrong. C E S P Q is not possible because S has to be accompanied with A.

2. (*d*) : If R is selected, P cannot be selected. So, P S A D is wrong.
D and Q cannot go together. So, Q S A D is wrong.
S and A have to be together. So, Q S C E is wrong.

3. (*c*) : If D is selected, Q cannot be selected. So, P Q B C and P Q C E are not correct.
S and A have to be together. So, P S C E is also wrong.

4. (*d*) : If A and C are members, S and E have also to be selected. So, P Q E is not the correct combination.

5. (*a*) : P and R cannot be together. So, R S A D is wrong.
S and A have to be together. So, Q S B D and Q S C E are incorrect.

6. (*b*) : The male advocates are A and B, lady doctors are P, Q and S; teachers are E, T and U.
Now, A and B will be selected.
A, P and U have to be together.
Now, we have to select one lady doctor more. It can be Q or S. But Q and E have to be together. Since E is not selected, so S will be selected.
Thus, the team is A B P U S.

7. (*b*) : The advocates are A, B and R; doctors are C, D, P, Q, S; teachers are E, T and U. The team consists of 3 teachers *i.e.* E, T, U.
Now, A, P and U have to be together.
E and Q have to be together.
Thus, the team is A E P Q T U.

8. (*a*) : The male advocates are A and B; male doctors are C and D; lady doctors are P, Q and S; teachers are E, T and U.
If A is selected, P and U will be selected. D and P cannot go together. So, a male doctor C will be selected. C and T have to be together. Thus, the team is A C P T U. If B is selected, D will not be selected. So, male doctor C will be chosen. C and T have to be together. Now, the second teacher to be selected is E or U. But, U cannot go without A. So, E will be selected. E and Q have to be together. Thus, the team can also be B C E Q T.

9. (*c*) : The advocates are A, B and R; the doctors are C, D, P, Q and S; male teacher is E. Clearly, E will be selected. E and Q have to be together. C and Q cannot be together. So, C will not be selected. P also cannot be selected because U is not selected. So, two other doctors D and S will be selected. P is not selected, so A will not be selected. D is selected, so B cannot be selected. Thus, the team is D E Q R S.

10. (*a*) : A C P R T U and A E P Q R T are wrong because each of these combinations consists of four ladies. B C E Q R T is incorrect because B and R cannot go together.

11. (*a*) : The doctors are A, B, C, D and E; female teachers are O, P and Q; engineers are G, H, K and L. The three female teachers to be selected are O, P and Q.
Now, wherever there is a male doctor, there will be no female teacher. But three female teachers are selected. So, C, D and E cannot be selected. Thus, two doctors selected are A and B.
Since female doctors are selected, so male engineers K and L cannot be selected.
Hence, the team formed is A B O P Q G H.

12. (*d*) : The doctors are A, B, C, D and E; engineers are G, H, K and L; teachers are M, N, O, P, Q and R. Four teachers are needed. There are three male teachers. So, female teachers are also to be selected. So, male doctors *i.e.* C, D and E cannot be selected. Thus, the two doctors selected will be A and B.
Both the doctors selected are females. So, male engineer K or L cannot be selected and either G or H is to be chosen.
Clearly, the impossible team is A B K N R P Q, because K is not to be selected.

13. (*c*) : The doctors are A, B, C, D and E; female teachers are O, P and Q; engineers are G, H, K and L. Since two female teachers are to be selected, so male doctors *i.e.* C, D and E cannot be selected. Thus, the two doctors selected will be A and B. Both the doctors are females. So, male engineer K or L cannot be selected and G and H are to be chosen.
Clearly, the only impossible team is A B K L P Q.

14. (*c*) : The doctors are A, B, C, D and E; male engineers are K and L; teachers are M, N, O, P, Q and R. Clearly, the two male engineers to be selected are K and L.
Since male engineers are selected, so female doctors *i.e.* A and B cannot be selected. Thus, three doctors to be selected are C, D and E. The doctors selected are all males. So, female teachers O, P and Q cannot be selected. Thus, two teachers out of M, N and R are to be selected.
Hence, the possible team is C D E K L M N.

15. (*d*) : Since no particular specifications are given, so we shall verify the correctness of the suggested teams separately. Clearly, C D K L O P is incorrect because C and D are male doctors and so cannot go with female teachers O and P.

Questions 16 to 18

Consider two cars I and II.

A and D sit in the same car, say I.

H is not in the same car *i.e.* H is in car II.

B and C are not in the same car in which D is sitting *i.e.* B and C are in car II.

F sits along with A and E in the same car *i.e.* car I.

G is in the other car *i.e.* car II.

Thus, we have :

Car I → A, D, E, F

Car II → B, C, G, H

16. (*a*) : B and C are sitting in the same car in which G and H are sitting.

17. (*d*) : Clearly, G is not sitting in the car in which A and E are sitting.

18. (*a*) : Clearly, statement (*i*) is not necessary.

19. (*c*) : Condition (*i*) makes (*e*) incorrect.

Condition (*ii*) is not followed in (*d*).

Condition (*iii*) is not followed in (*a*).

Condition (*iv*) is not followed in (*b*).

So, the only correct set is (*c*).

20. (*c*) : Clearly, if R is operated at the fourth place, V must be operated somewhere after it. This is not possible since the fifth program is the last one which has to be either S or U. So, R cannot be operated at the fourth place.

21. (*a*) : If R is operated at third place, it will be followed by V at the fourth place and S or U at the end.

So, Q which must have T as one of the programs after it, cannot be at the second place.

22. (*e*) : Since R is operated, so V must also be operated.

Also, S or U is to be taken at the end.

So, the possible combinations are Q, S, V and T, S, V.

Now, Q must have T as one of the programs after it, which is not possible. So, Q, S, V is incorrect.

23. (*b*) : It is given that on any one day, only three of the program sets must be the ones that were operated on the previous day.

But, (*b*) contains four programs out of those operated on the first day. So, it is the wrong combination.

TYPE 6 : FAMILY-BASED PROBLEMS

In such type of questions, some clues are given regarding relationship among different members of a family and their professions, qualities, dresses, preferences etc. The candidate is required to analyse the whole information and then answer the given questions accordingly.

Ex. ***Read the following information carefully and answer the questions given below it :***

(*i*) There is a group of six persons A, B, C, D, E and F from a family. They are Psychologist, Manager, Lawyer, Jeweller, Doctor and Engineer.

(*ii*) The doctor is the grandfather of F who is a Psychologist.

(*iii*) The Manager D is married to A.

(*iv*) C, the Jeweller is married to the Lawyer.

(*v*) B is the mother of F and E.
(*vi*) There are two married couples in the family.

1. What is the profession of E ?
(*a*) Doctor (*b*) Jeweller (*c*) Manager
(*d*) Psychologist (*e*) None of these

2. How is A related to E ?
(*a*) Brother (*b*) Uncle (*c*) Father
(*d*) Grandfather (*e*) None of these

3. How many male members are there in the family ?
(*a*) One (*b*) Three (*c*) Four
(*d*) Data inadequate (*e*) Cannot be determined

4. What is the profession of A ?
(*a*) Doctor (*b*) Lawyer (*c*) Jeweller
(*d*) Manager (*e*) None of these

5. Which of the following is one of the pairs of couples in the family ?
(*a*) AB (*b*) AC (*c*) AD
(*d*) Cannot be determined (*e*) None of these

Solution : Given F is a psychologist.

B is the mother of F and E means E is the brother or sister of F.

There are only two married couples in the family. Since D is married to A, so C, the jeweller, who is married to a lawyer, will be married to B.

Again, the Manager D is married to A means A is the doctor and Grandfather of F and E.

Also, no one else is an Engineer. So, E must be an Engineer.

1. Clearly, E is an Engineer. So, the answer is (*e*).

2. Clearly, A is the grandfather of F and E is the brother or sister of F. So, A is the grandfather of E. Hence, the answer is (*d*).

3. Since nothing is mentioned about E and F, so the number of males cannot be determined. Hence, the answer is (*e*).

4. Clearly, A who is the grandfather of D is the doctor. Hence, the answer is (*a*).

5. Clearly, D, the manager is married to A. So, AD is one of the couples in the family. Hence, the answer is (*c*).

EXERCISE 6F

Directions (*Questions 1 to 4*) : *Study the following information carefully and answer the questions given below it :*

Prashant Arora has three children — Sangeeta, Vimal and Ashish. Ashish married Monika, the eldest daughter of Mr. and Mrs. Roy. The Roys married their youngest daughter to the eldest son of Mr. and Mrs. Sharma, and they had two children named Amit and Shashi. The Roys have two more children, Roshan and Vandana, both elder to Veena. Sameer and Ajay are sons of Ashish and Monika. Rashmi is the daughter of Amit.

1. What is the surname of Rashmi ?
(*a*) Sharma (*b*) Roy (*c*) Arora
(*d*) Cannot be determined (*e*) None of these

2. How is Sameer related to the father of Monika ?
(*a*) Grandson (*b*) Son (*c*) Cousin
(*d*) Son-in-law (*e*) None of these

3. What is the surname of Sameer ?
(*a*) Roy (*b*) Sharma (*c*) Arora
(*d*) Cannot be determined (*e*) None of these

4. How is Mrs. Roy related to Ashish ?
(*a*) Aunt (*b*) Mother-in-law (*c*) Mother
(*d*) Sister-in-law (*e*) None of these

Directions (*Questions 5 to 9*) : *Read the following information carefully and answer the questions that follow :* **(Railways, 1994)**

(*i*) P, Q, R, S, T and U are travelling in a bus.
(*ii*) There are two reporters, two technicians, one photographer and one writer in the group.
(*iii*) The photographer P is married to S who is a reporter.
(*iv*) The writer is married to Q who is of the same profession as that of U.
(*v*) P, R, Q, S are two married couples and nobody in the group has same profession.
(*vi*) U is brother of R.

5. Which of the following is a pair of technicians ?
(*a*) RS (*b*) SU (*c*) PT (*d*) QU

6. Which of the following is a pair of reporters ?
(*a*) PQ (*b*) RT (*c*) ST (*d*) SU

7. How is R related to U ?
(*a*) Brother (*b*) Sister (*c*) Uncle (*d*) Cannot be determined

8. Which of the following pairs is a couple ?
(*a*) PQ (*b*) QR (*c*) QS (*d*) PT

9. Which of the following is a pair of husbands ?
(*a*) PQ (*b*) PR (*c*) QS (*d*) Cannot be determined

Directions (*Questions 10 to 14*) : *Study the following information carefully and answer the questions given below it :* **(Bank P.O. 1995)**

(*i*) P, Q, R, S, T and U are six members in a family in which there are two married couples.
(*ii*) T, a teacher is married to the doctor who is mother of R and U.
(*iii*) Q, the laywer is married to P.
(*iv*) P has one son and one grandson.
(*v*) Of the two married ladies one is a housewife.
(*vi*) There is also one student and one male engineer in the family.

10. How is P related to R ?
(*a*) Grandfather (*b*) Mother (*c*) Sister
(*d*) Grandmother (*e*) None of these

11. Who among the following is the housewife ?
(*a*) P (*b*) Q (*c*) S (*d*) T (*e*) None of these

12. How is R related to U ?
(*a*) Brother (*b*) Sister (*c*) Brother or Sister
(*d*) Data inadequate (*e*) None of these

13. Which of the following represents the group of females in the family ?
(*a*) PSR (*b*) PSU (*c*) QTR
(*d*) Data inadequate (*e*) None of these

14. Which of the following is true about the grand-daughter in the family ?
(*a*) She is a lawyer. (*b*) She is a student. (*c*) She is an engineer.
(*d*) Data inadequate (*e*) None of these

Directions (*Questions 15 to 19*) : *Study the information given below and answer the questions that follow :*

There are five persons P, Q, R, S and T. One is football player, one is chess player and one is hockey player. P and S are unmarried ladies and do not participate in any game. None of the ladies plays chess or football. There is a married couple in which T is the husband. Q is the brother of R and is neither a chess player nor a hockey player.

15. Who is the football player ?
(*a*) P (*b*) Q (*c*) R (*d*) S (*e*) T

16. Who is the hockey player ?
(*a*) P (*b*) Q (*c*) R (*d*) S (*e*) T

17. Who is the chess player ?
(*a*) P (*b*) Q (*c*) R (*d*) S (*e*) T

18. Who is the wife of T ?
(*a*) P (*b*) Q (*c*) R (*d*) S (*e*) None

19. The three ladies are :
(*a*) P, Q, R (*b*) Q, R, S (*c*) P, Q, S (*d*) P, R, S (*e*) None of these

Directions (*Questions 20 to 24*) : *Read the following information carefully and answer the questions given below it :* **(Bank P.O. 1995)**

(*i*) There is a family of six members A, B, C, D, E and F.
(*ii*) There are two married couples in the family and the family members represent three generations.
(*iii*) Each member has a distinct choice of a colour amongst green, yellow, black, red, white and pink.
(*iv*) No lady member likes either green or white.
(*v*) C, who likes black colour is the daughter-in-law of E.
(*vi*) B is brother of F and son of D and likes pink.
(*vii*) A is grandmother of F and F does not like red.
(*viii*) The husband has a choice of green colour, his wife likes yellow.

20. Which of the following is the colour preference of A ?
(*a*) Red (*b*) Yellow (*c*) Either Red or Yellow
(*d*) Cannot be determined (*e*) None of these

21. How many male members are there in the family ?
(*a*) Two (*b*) Three (*c*) Four
(*d*) Cannot be determined (*e*) None of these

22. Which of the following is true about F ?
(*a*) Brother of B (*b*) Sister of B (*c*) Daughter of C
(*d*) Either sister or brother of B (*e*) None of these

23. Which of the following is the colour combination of one of the couples ?
(*a*) Red-Yellow (*b*) Yellow-Red (*c*) Green-Black
(*d*) Yellow-Green (*e*) None of these

24. Which of the following is one of the married couples ?
(*a*) AC (*b*) CD (*c*) DA
(*d*) Cannot be determined (*e*) None of these

Directions (*Questions 25 to 29*) : *Study the following information carefully and answer the questions that follow :* **(Bank P.O. 1994)**

(*i*) A, B, C, D, E and F are six members in a family in which there are two married couples.
(*ii*) D is brother of F. Both D and F are lighter than B.
(*iii*) B is mother of D and lighter than E.
(*iv*) C, a lady, is neither heaviest nor the lightest in the family.
(*v*) E is lighter than C.
(*vi*) The grandfather in the family is the heaviest.

25. How is E related to F ?
(*a*) Grandmother (*b*) Brother (*c*) Father
(*d*) Data inadequate (*e*) None of these

26. Which of the following is a pair of married couples ?
(*a*) AB (*b*) BC (*c*) AD (*d*) BE (*e*) None of these

27. How many male members are there in the family ?
(*a*) Two (*b*) Three (*c*) Four
(*d*) Data inadequate (*e*) None of these

28. Who among the following will be in the second place if all the members in the family are arranged in the descending order of their weights ?
(*a*) A (*b*) C (*c*) D (*d*) Data inadequate (*e*) None of these

29. How is C related to D ?
(*a*) Grandmother (*b*) Cousin (*c*) Sister
(*d*) Mother (*e*) None of these

Directions : *On the basis of the information given below, answer questions 30 to 33.* **(S.B.I.P.O. 1994)**

(*i*) P, Q, R, S, T and U are six members of a group of which three are males and three are females.
(*ii*) There are two engineers, two lawyers, one teacher and one doctor in the group.
(*iii*) Q, T, P and R are two married couples and no person in this group has the same profession.
(*iv*) T, a teacher with blue dress, married a male lawyer with brown dress.
(*v*) Colour of the dresses of both the husbands and that of both the wives is the same.
(*vi*) Two persons have blue dress, two have brown and the remaining one each has black and green.
(*vii*) P is a male engineer whose sister S is also an engineer.
(*viii*) Q is a doctor.

30. Who is the wife of P ?
(*a*) Q (*b*) R (*c*) S (*d*) T (*e*) None of these

31. Which of the following is a group of female members ?
(*a*) QSR (*b*) QST (*c*) QSU (*d*) QTU (*e*) UST

32. Which of the following is a pair of married ladies ?
(*a*) PR (*b*) TS (*c*) QT
(*d*) Data inadequate (*e*) None of these

33. What is the colour of U's dress ?
(*a*) Black (*b*) Green (*c*) Black or Green
(*d*) Data inadequate (*e*) None of these

Directions (*Questions 34 to 38*) : *Read the following information to answer the questions given below it :* **(S.B.I.P.O. 1995)**

(*i*) In a family of six persons, there are people from three generations. Each person has separate profession and also they like different colours. There are two couples in the family.
(*ii*) Rohan is a CA and his wife neither is a doctor nor likes green colour.
(*iii*) Engineer likes red colour and his wife is a teacher.
(*iv*) Mohini is mother-in-law of Sunita and she likes orange colour.
(*v*) Vinod is grandfather of Tanmay and Tanmay, who is a principal, likes black colour.
(*vi*) Nanu is grand-daughter of Mohini and she likes blue colour. Nanu's mother likes white colour.

34. Who is an Engineer ?
(*a*) Nanu (*b*) Mohini (*c*) Sunita
(*d*) Cannot be determined (*e*) None of these

35. What is the profession of Sunita ?
(*a*) Engineer (*b*) Doctor (*c*) Teacher
(*d*) Cannot be determined (*e*) None of these

36. Which of the following is the correct pair of two couples ?
(*a*) Mohini-Vinod and Rohan-Sunita (*b*) Vinod-Mohini and Rohan-Nanu
(*c*) Rohan-Sunita and Tanmay-Nanu (*d*) Cannot be determined
(*e*) None of these

37. How many ladies are there in the family ?
(*a*) Two (*b*) Three (*c*) Four
(*d*) Cannot be determined (*e*) None of these

38. Which colour is liked by CA ?
(*a*) Green (*b*) White (*c*) Either White or Greer.
(*d*) Cannot be determined (*e*) None of these

ANSWERS

1. (*a*) : Rashmi is the daughter of Amit who is, therefore the eldest son of Sharmas and married to Veena, the youngest daughter of the Roys. So, the surname of Rashmi is Sharma.

2. (*a*) : Sameer is the son of Ashish who is the son of Prashant Arora. So, Sameer will be the grandson of Monika's father.

3. (*c*) : Sameer is the son of Ashish who is the son of Prashant Arora. So, surname of Sameer is Arora.

4. (*b*) : Ashish is married to Monika who is the daughter of Mrs. Roy. So, Mrs. Roy will be the mother-in-law of Ashish.

Questions 5 to 9

P is a photographer.
P is married to S. So, one couple is PS. Then, the other couple is RQ.
S is a reporter.
The writer is married to Q. So, R is the writer. Now, P, Q, R, S have different professions. So, Q is a technician and thus U is also a technician.
U is the brother of R.
We now know the professions of P, Q, R, S and U. Only T remains. Since there are two reporters in the group, so T is also a reporter.

5. (*d*) : Q and U are technicians.
6. (*c*) : S and T are reporters.
7. (*d*) : Since the sex of R is not given, so R may be the brother or sister of U.
8. (*b*) : PS and QR are two couples.
9. (*d*) : The sex of P, Q, R, S is not given. So, the pair of husbands cannot be determined.

Questions 10 to 14

One couple is QP.
Now, R and U are the children of T. So, the other couple is TS.
T is a teacher.
S is a female doctor.
Q is a lawyer.
Clearly, P is a housewife and hence a female.
S is the mother of R and U.
P has one son and one grandson.
Clearly, T is the son of P and R or U is the grandson.
The grandson is a male engineer and the grand-daughter is a student.

10. (*d*) : P is the grandmother of R.
11. (*e*) : P is the housewife.
12. (*c*) : R may be the brother or sister of U.
13. (*d*) : Since the sex of R and U is not given, so the set of three females cannot be determined.
14. (*b*) : The grand-daughter is a student.

Questions 15 to 19

Clearly, Q is neither a hockey player nor a chess player. So, he must be a football player and thus cannot be a lady. T is a husband (not a lady) and so must be a chess player. Hence, R must be a hockey player, and therefore she must be a lady and T's wife. So, the information can be summarised as follows :
P — unmarried lady, does not participate in games.
Q — brother of R, football player.
R — hockey player, T's wife.
S — unmarried lady, does not participate in games.
T — husband of R, chess player.

15. (*b*) : Q is the football player.
16. (*c*) : R is the hockey player.
17. (*e*) : T is the chess player.
18. (*c*) : R is the wife of T.
19. (*d*) : The three ladies are P, R and S.

Questions 20 to 24

B and F are children of D.
A is grandmother of F. So, B and F represent third generation.

Now, C is the daughter-in-law of E. So, A and E form a couple and represent first generation. A, being grandmother, is a female and so E is a male.
C is the daughter-in-law of E and so D is E's son. Thus, CD is the other couple and represents second generation.
C likes black, B likes pink. Green and yellow are the preferences of a couple. So, A likes yellow and E likes green. Now, F does not like red. So, F likes white and D likes red.
Now, F likes white and so cannot be a lady. B is the son of D and hence a male.

20. (*b*) : A prefers yellow colour.

21. (*c*) : There are four male members — E, D, B, F.

22. (*a*) : Both F and B are males and both are children of D. So, F is the brother of B.

23. (*d*) : Yellow-Green is the colour combination of the couple AE.

24. (*b*) : AE and CD are two couples.

Questions 25 to 29

In terms of weight, F < B, D < B, B < E, E < C. So, we have : D < F < B < E < C or F < D < B < E < C. C is not the heaviest. So, A is the heaviest. Thus, the sequence becomes : F < D < B < E < C < A or D < F < B < E < C < A.
D is the brother of F.
B is the mother of D and F.
A, being the heaviest, is the grandfather.
Now, C is a lady and so one couple is AC.
B is a female and so cannot pair up with C. So, the other couple is BE.

25. (*c*) : E is the husband of B and B is the mother of F. So, E is the father of F.

26. (*d*) : AC and BE are the married couples. BE is one of them.

27. (*d*) : The sex of F is known.

28. (*b*) : The descending order of weights is :
A > C > E > B > F > D or A > C > E > B > D > F.
Clearly, C comes second.

29. (*a*) : C is the wife of A and A is the grandfather of D. So, C is the grandmother of D.

Questions 30 to 33

T is a female teacher with blue dress.
T married a lawyer. Now, P is an engineer and Q is a doctor. Clearly, T married R.
R is, thus, a male lawyer with brown dress.
One couple is RT. So, the other couple is PQ.
P is a male engineer and has the same dress as R *i.e.*, brown.
Q is a female doctor and has the same dress as T *i.e.*, blue.
S is the sister of P. S is a female engineer. Now, U remains. Since there are two lawyers, so U is a lawyer.
Both S and U have either black or green dress.

	P	Q	R	S	T	U
Profession	Engineer	Doctor	Lawyer	Engineer	Teacher	Lawyer
Colour of dress	Brown	Blue	Brown	Black or Green	Blue	Black or Green
Sex	Male	Female	Male	Female	Female	Male

30. (*a*) : Q is the wife of P.

31. (*b*) : Q, S and T are female members.

32. (*c*) : Q and T are married ladies.

33. (*c*) : U's dress is black or green in colour.

Questions 34 to 38

Mohini is mother-in-law of Sunita and grandmother of Nanu. Vinod is grandfather of Tanmay. So, Nanu and Tanmay represent third generation.

Mohini and Vinod form a couple and represent first generation.

Clearly, Rohan and Sunita form the other couple and represent second generation.

Rohan is a CA. Since engineer is married, so Vinod is an engineer and likes red colour.

Mohini is a teacher and likes orange colour.

Nanu likes blue colour.

Tanmay is a Principal and likes black colour.

Sunita, Nanu's mother, likes white colour.

Clearly, Rohan likes green colour.

34. (*e*) : Vinod is an engineer.

35. (*d*) : The only clue that Sunita, Rohan's wife, is not a doctor, cannot lead to her correct profession. So, the data is inadequate.

36. (*a*) : The two couples are Mohini-Vinod and Rohan-Sunita.

37. (*b*) : There are three ladies in the family — Mohini, Sunita and Nanu.

38. (*a*) : Rohan is a CA and likes green colour.

TYPE 7 : JUMBLED PROBLEMS

In this type of questions, some mixed clues regarding three or more qualities of given items or persons is given. The candidate is required to analyse this mixed information with respect to different qualities and classify the items accordingly.

Ex. ***Read the following statements and answer the questions that follow :***

Of the six men of literature A, B, C, D, E and F being considered here, two belonged to the 17th century, three to the 19th and one to the 20th century. Four were recognised as great poets, three as great novelists and three as great dramatists. One contributed to Bengali literature, two to Hindi, two to Marathi and one to Tamil. The 20th century writer wrote poetry only and contributed to Marathi literature and the other Marathi writer contributed to poetry, novel and drama. One Hindi writer and the only Tamil writer belonged to the 19th century. The former contributed to poetry and novel while the latter to novel and drama. The Bengali writer belonged to the 17th century and contributed to poetry only. A belonged to the 20th century, B wrote drama only, C contributed to Marathi literature, D was a Hindi poet and novelist and belonged to the 19th century. E also belonged to the 19th century, and F contributed to poetry only.

1. To which language did B contribute ?

(*a*) Bengali (*b*) Hindi (*c*) Marathi (*d*) Tamil

2. Among these, who was the Tamil writer ?

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

3. To which branch of literature did A contribute ?

(*a*) Poetry (*b*) Novel (*c*) Drama (*d*) All of these

4. Among these, who was the Bengali writer ?

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

5. To which branch of literature did C contribute ?

(*a*) Poetry (*b*) Drama (*c*) Novel (*d*) All the three

Solution : Clearly, there is one belonging to 20th century. So, A who belongs to 20th century contributes to Marathi poetry.

Also, D is a Hindi poet and novelist who belongs to the 19th century.

There are only two Marathis. So, C who is a Marathi will contribute to poetry, novel and drama.

Clearly, there are only four poets. So, F who is a poet, will be Bengali belonging to the 17th century. There is now no other Bengali, no other Marathi and no other poet. B, who wrote drama only cannot be Tamil and does not belong to 19th century. So, B belongs to 17th century and is a Hindi dramatist. Thus, E belonging to the 19th century is a Tamil novelist and dramatist. C will belong to the 19th century.

1. (*b*) : B contributes to Hindi.

2. (*c*) : E is the Tamil writer.

3. (*a*) : A contributes to poetry alone.

4. (*d*) : F is the Bengali writer.

5. (*d*) : C contributes to all the three — poetry, novel and drama.

EXERCISE 6G

Directions (*Questions 1 to 5*) : *Read the following information carefully and answer the questions that follow :*

(*i*) There is a group of five persons — A, B, C, D and E.

(*ii*) One of them is a horticulturist, one is a physicist, one is a journalist, one is an industrialist and one is an advocate.

(*iii*) Three of them — A, C and advocate prefer tea to coffee and two of them — B and the journalist prefer coffee to tea.

(*iv*) The industrialist and D and A are friends to one another but two of these prefer coffee to tea.

(*v*) The horticulturist is C's brother.

1. Who is a horticulturist ?

(*a*) A (*b*) B (*c*) C (*d*) D (*e*) E

2. Who is an industrialist ?

(*a*) E (*b*) C (*c*) B (*d*) D (*e*) A

3. Which of the following groups includes a person who likes tea but is not an advocate ?

(*a*) ACE (*b*) DE (*c*) BCE (*d*) BD (*e*) None of these

4. Who is a physicist ?

(*a*) A (*b*) E (*c*) D (*d*) C (*e*) B

5. Which of the statements above is superfluous ?

(*a*) (*iii*) (*b*) (*iv*) (*c*) (*ii*) (*d*) (*v*) (*e*) Nil

Directions (*Questions 6 to 10*) : *Study the following information carefully and answer the questions given below it :* **(L.I.C.A.A.O. 1995)**

There are five friends A, B, C, D and E. Two of them are businessmen while the other three belong to different occupations *viz.* medical, engineer and legal. One businessman and the lawyer stay in the same locality S, while the other three stay in three different localities P, Q and R. Two of these five persons are Hindus while the remaining three come from three different communities *viz.* Muslim, Christian

and Sikh. The lawyer is the oldest in age while one of the businessmen who runs a factory is the youngest. The other businessman is a cloth merchant and agewise lies between the doctor and the lawyer. D is a cloth merchant and stays in locality S while E is a Muslim and stays in locality R. The doctor is a Christian and stays in locality P, B is a Sikh while A is a Hindu and runs a factory.

6. Who stays in locality Q ?
(*a*) A (*b*) B (*c*) C (*d*) E

7. What is E's occupation ?
(*a*) Business (*b*) Engineer (*c*) Lawyer (*d*) Doctor

8. Agewise who among the following lies between A and C ?
(*a*) Lawyer (*b*) Doctor (*c*) Cloth merchant (*d*) Engineer

9. What is B's occupation ?
(*a*) Business (*b*) Engineer (*c*) Lawyer (*d*) Doctor

10. What is C's occupation ?
(*a*) Doctor (*b*) Lawyer (*c*) Engineer (*d*) Business

Directions (*Questions 11 to 15*) : *Read the following information and answer the questions that follow :* **(A.A.O. Exam, 1988)**

A, B, C, D and E are five towns out of which two are hill stations and the rest are in plain. Two towns, which are in plain, are harbours. Four towns out of five are capitals and two are industrial towns. Population of two towns is less than 5 lacs. It is 20 lacs of one town and more than 50 lacs of two towns. Two towns are on the same latitudes and other two are on the same longitudes. Latitudes and longitudes of both harbours are different and out of these one is an industrial town. The population of both industrial towns is more than 50 lacs. The longitudes of one hill station and one of the industrial towns are same. The latitudes and longitudes of the other hill station and other harbour are different. One industrial town is neither a hill station nor a harbour. None of the hill stations is an industrial town. The hill station of which longitudes are same as that of a harbour, is a capital. B is a hill station while the longitudes of A and E are same. E is a harbour. The latitudes of D and C are same and the population of D is 20 lacs. Both the harbours are capitals and one of them is an industrial town.

11. Which of the following two towns are those whose population is less than 5 lacs ?
(*a*) D and A (*b*) B and C (*c*) A and B (*d*) A and C (*e*) None of these

12. Which of the following towns is not a capital ?
(*a*) A (*b*) C (*c*) D (*d*) E (*e*) B

13. Which of the following is harbour, capital and industrial town ?
(*a*) A (*b*) B (*c*) C (*d*) E (*e*) D

14. Which of the following towns have population more than 50 lacs ?
(*a*) A and D (*b*) B and E (*c*) C and E (*d*) C and D (*e*) A and C

15. Which one of the following towns is hill station as well as capital ?
(*a*) B (*b*) C (*c*) E (*d*) D (*e*) A

Directions : *Questions 16 to 20 are based on the information given below. Study it carefully and choose the correct alternative in each question.*

(Bank P.O. 1993)

(*i*) There are eight faculty members A, B, C, D, E, F, G and H in the institute, each teaching a different subject.

(*ii*) There are three lady members and of the eight, four are holding Ph.D. Degree.
(*iii*) E teaches Psychology and is Ph.D. A teaches Chemistry.
(*iv*) The one who teaches Economics is not Ph.D. No lady member teaches either Commerce or Law. Law faculty does not award Ph.D.
(*v*) D and G do not teach either Commerce or Physics.
(*vi*) H and C are lady members and are not Ph.D. F who is Ph.D. teaches Zoology.
(*vii*) B and G are Ph.Ds and G is a lady member.

16. Who teaches Physics ?
(*a*) C (*b*) Either H or C (*c*) H
(*d*) Either C or G (*e*) None of these

17. Which of the following lady members is/are Ph.D. ?
(*a*) G (*b*) G and H (*c*) C and D
(*d*) Cannot be determined (*e*) None of these

18. Which of the following statements is true ?
(*a*) Two lady members are Ph.D.
(*b*) Three male members are Ph.D.
(*c*) The person who teaches Zoology is not Ph.D.
(*d*) The person who teaches Economics is Ph.D.
(*e*) None of these

19. Which of the following combinations is not correct ?
(*a*) Commerce-Male-Ph.D. (*b*) Economics-Lady-Non-Ph.D.
(*c*) Physics-Lady-Ph.D. (*d*) Zoology-Male-Ph.D.
(*e*) Chemistry-Male-Non-Ph.D.

20. What is the subject taught by G ?
(*a*) Zoology (*b*) Either Physics or Zoology
(*c*) Either Physics or Economics (*d*) Cannot be determined
(*e*) None of these

Directions (*Questions 21 to 25*) : *Study the following information carefully and answer the questions given below it :* **(Hotel Management, 1996)**

Of the five boys A, B, C, D and E two are good, one is poor and two are average in studies. Two of them study in post-graduate classes and three in under-graduate classes. One comes from a rich family, two from middle-class families and two from poor families. One of them is interested in music, two in acting and one in sports. Of those studying in under-graduate classes, two are average and one is poor in studies. Of the two boys interested in acting, one is a post-graduate student. The one interested in music comes from a middle-class family. Both the boys interested in acting are not industrious. The two boys coming from middle-class families are average in studies and one of them is interested in acting. The boy interested in sports comes from a poor family, while the one interested in music is industrious. E is industrious, good in studies, comes from a poor family and is not interested in acting, music or sports. C is poor in studies inspite of being industrious. A comes from a rich family and is not industrious but good in studies. B is industrious and comes from a middle-class family.

21. Name the boy interested in sports.
(*a*) A (*b*) B (*c*) C (*d*) D

22. Name the boy interested in music.
(*a*) A (*b*) B (*c*) C (*d*) D

23. Name the middle-class family boy interested in acting.
(*a*) A (*b*) B (*c*) C (*d*) D

24. Name the boys studying in post-graduate classes.
(*a*) A, D (*b*) A, E (*c*) B, C (*d*) D, E

25. Name the boy who is not industrious and is average in studies.
(*a*) A (*b*) B (*c*) C (*d*) D

ANSWERS

Questions 1 to 5

A prefers tea. So, from (*iv*), the industrialist and D prefer coffee. But, from (*iii*), B and the journalist prefer coffee. So, B is the industrialist and D is the journalist.

Now, A, C and advocate remain. Clearly, E is the advocate.

The horticulturist is C's brother. It can be only A. C is a physicist.

	A	B	C	D	E
Profession	Horticulturist	Industrialist	Physicist	Journalist	Advocate
Preference	Tea	Coffee	Tea	Coffee	Tea

1. (*a*) : A is a horticulturist.

2. (*c*) : B is an industrialist.

3. (*e*) : Clearly, A and C are the persons who like tea but are not advocates.

4. (*d*) : C is the physicist.

5. (*e*) : Since all the statements are required to analyse the given data, none of them is superfluous.

Questions 6 to 10

I. A is a Hindu, B is a Sikh, E is a Muslim. Now, the doctor is a Christian and D is a cloth merchant. So, C is a Christian and D is a Hindu.

II. D stays in locality S. E stays in locality R. Now, one businessman *i.e.*, D and the lawyer stay in S. C is a doctor and A a factory owner. So, B is the lawyer and stays in locality S. C, the doctor, stays in locality P. Clearly, A stays in locality Q.

III. Clearly, A is a factory owner, B is a lawyer, C is a doctor, D is a cloth merchant and E is an engineer.

	A	B	C	D	E
Profession	Factory owner	Lawyer	Doctor	Cloth merchant	Engineer
Religion	Hindu	Sikh	Christian	Hindu	Muslim
Locality	Q	S	P	S	R

IV. B, the lawyer, is oldest. A, the factory owner, is the youngest. D, the cloth merchant lies between doctor and lawyer *i.e.* B and C in age.

So, agewise sequence is : B > D > C > E > A.

6. (*a*) : A stays in locality Q.

7. (*b*) : E is an engineer.

8. (*d*) : E lies between A and C. E is an engineer.

9. (*c*) : B is a lawyer.

10. (*a*) : C is a doctor.

Questions 11 to 15

We analyse the given information as follows :
Two are hill stations.
Three are plains of which two are harbours.
Four towns are capitals.
Two towns are industrial.
Two towns have population less than 5 lacs.
One town has population 20 lacs.
Two towns have population more than 50 lacs.
Two towns are on same latitudes.
B is a hill station. E is a harbour. Clearly, A which has the same longitude as E, cannot be a harbour and clearly, D having population 20 lacs cannot be an industrial town. So, it is a harbour. Thus, E and D are harbours.
Clearly, one harbour is industrial town but D is not. So, E is an industrial town with population more than 50 lacs. Clearly, longitudes of a hill station and industrial town are same. So, A having same longitude as E, is a hill station. Latitudes of D and C are same and D is a harbour. So, C cannot be a hill station. So, B is the other hill station. Thus, three plains are C, D, E. One industrial town is neither a hill station nor a harbour. So, C is an industrial town with population more than 50 lacs. Clearly, both harbours are capitals. So, E and D are capitals. The hill station A, having same longitude as a harbour, is also a capital. Population of D is 20 lacs. So, population of A and B is less than 5 lacs. Clearly, only one hill station is capital. So, C is the other capital.

11. (*c*) : Clearly, population of A and B is less than 5 lacs.
12. (*e*) : Clearly, B is not a capital.
13. (*d*) : Harbours are E and D, capitals are A, C, D and E and industrial towns are C and E. So, E is harbour, capital and industrial town.
14. (*c*) : Clearly, the industrial towns C and E have a population of more than 50 lacs.
15. (*e*) : The capitals are A, C, D and E. The hill stations are A and B. So, A is a hill station as well as a capital.

Questions 21 to 25

I. A and E are good in studies; C is poor in studies. The remaining two *i.e.* B and D are average in studies.
II. A comes from a rich family; E belongs to a poor family.
Now, B and D are average in studies. So, B and D come from middle-class families.
Now, C remains. So, C belongs to a poor family (because two boys come from poor families).
III. The students who are poor and average in studies are in under-graduate classes *i.e.* B, C and D.
The remaining two *i.e.* A and E study in post-graduate classes.
IV. B, C and E are industrious. A is not industrious. Now, two boys are not industrious. So, D is also not industrious.
V. Two boys interested in acting are not industrious. So, A and D are interested in acting. The boy interested in music comes from middle-class family. B and D come from middle-class families. But D is interested in acting. So, B is interested in music. E is not interested in any activity. Clearly, C is interested in sports.

21. (*c*) : C is interested in sports.
22. (*b*) : B is interested in music.
23. (*d*) : D is the middle-class family boy interested in acting.
24. (*b*) : A and E study in post-graduate classes.
25. (*d*) : D is not industrious and is average in studies.

SOME MISCELLANEOUS PUZZLES

EXERCISE 6H

Directions (*Questions 1 to 10*) : *Study the following information and answer the questions given below it:* **(M.B.A. 1977)**

A, B, C and D are four friends who do not mind exchanging items. A had two chessboards each costing Rs 500 and a record player. C originally had a cycle and a walkman. Each cricket bat costs Rs 700. Both D and C got a cricket bat from B. A gave his record player costing Rs 2000 to B. C got a camera costing Rs 1500 from D. The cycle C had costs Rs 1000 and the walkman costs Rs 700. B had three cricket bats at the beginning and D had two cameras total cost of which is Rs 5000. A gave one of his chessboards to C and took C's cycle. C gave his walkman to D.

1. Who did not have a cricket bat at the end of exchange of items ?
(*a*) A (*b*) B (*c*) C (*d*) D

2. Total cost of materials C had at the beginning was
(*a*) Rs 5000 (*b*) Rs 3000 (*c*) Rs 2100 (*d*) Rs 1700

3. After completion of exchange of items, A had with him an item which no one else had. What is the item ?
(*a*) Chessboard (*b*) Cycle (*c*) Record player (*d*) Walkman

4. At the beginning who had the costliest items ?
(*a*) A (*b*) B (*c*) C (*d*) D

5. In the process of exchange of items, B received an item from
(*a*) A (*b*) C (*c*) D (*d*) None of these

6. After exchange of items, B had
(*a*) one record player (*b*) one cricket bat
(*c*) one record player and one cricket bat
(*d*) one record player and one camera

7. After exchange of items, who had the items total cost of which is Rs 1500 ?
(*a*) A (*b*) B (*c*) C (*d*) D

8. Who incurred maximum loss after the exchange of items ?
(*a*) D (*b*) A (*c*) C (*d*) B

9. Who made profit after the exchange of items ?
(*a*) A and B (*b*) A and D (*c*) B and C (*d*) C and D

10. At the end of exchange of items, D had in his possession
(*a*) one cricket bat and one camera
(*b*) one camera, one walkman and one cricket bat
(*c*) one cricket bat and one walkman
(*d*) one camera and one walkman

Directions (*Questions 11 to 13*) : *Read the following information carefully and answer the questions given below it :*

The sum of the income of A and B is more than that of C and D taken together. The sum of the income of A and C is the same as that of B and D taken together. Moreover, A earns half as much as the sum of the income of B and D.

11. Whose income is the highest ?
(*a*) A (*b*) B (*c*) C (*d*) D

12. Which of the following statements is not correct ?

(*a*) A earns more than B. (*b*) B earns more than D.

(*c*) C earns more than D. (*d*) B earns more than C.

13. If A's income be Rs 80,000 per annum and the difference between the income of B and D be the same as A's income, B's income is

(*a*) Rs 40,000 (*b*) Rs 60,000 (*c*) Rs 80,000 (*d*) Rs 1,20,000

Directions (*Questions 14 to 18*) : *Study the information given below and answer the questions that follow :* **(M.A.T. 1998)**

A, B, C, D, E and F are cousins. No two cousins are of the same age, but all have birthdays on the same date. The youngest is 17 years old and the oldest E is 22. F is somewhere between B and D in age. A is older than B. C is older than D.

14. Which of the following is not possible ?

(*a*) D is 20 years old. (*b*) F is 18 years old.

(*c*) F is 19 years old. (*d*) F is 20 years old.

15. Which of the following could be the ages of D and C respectively, if B is 17 years old ?

(*a*) 18 and 19 (*b*) 19 and 21 (*c*) 18 and 20 (*d*) 18 and 21

16. Which of the following must be true if exactly two of the cousins are between C and F in age ?

(*a*) A is between F and D in age. (*b*) B is 17 years old.

(*c*) B is younger than D. (*d*) F is 18 years old.

17. If A is one year older than C, the number of logically possible orderings of all six cousins by increasing age is

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

18. Which of the following must be true if C is 19 years old ?

(*a*) A is 19 years old and D is 21. (*b*) B is 19 years old and A is 20.

(*c*) B is 20 years old and A is 21. (*d*) D is 17 years old and B is 21.

Directions (*Questions 19 to 22*) : *Read the following information carefully and answer the questions given below it :* **(S.B.I.P.O. 1995)**

There are five identical looking boxes having different objects in it and every box has a label indicating their contents. The following is the description of the contents and the label of each box :

Contents	Label
Two Pins	PP
Two Balls	BB
Two Clips	CC
One Pin and One Clip	PC
One Ball and One Clip	BC

Somebody has mischieviously interchanged these labels in such a way that no box contains the label correctly explaining its contents.

19. If the first box opened contained label PP and the second box opened contained label PC and out of the combined four items, one item was a Ball, which of the following will be definitely true ?

(*a*) Other three items will not contain two Balls.

(*b*) Other three items will not contain any Clip.

(*c*) Other three items will contain atleast one Clip.
(*d*) Other three items will not contain two Pins.
(*e*) None of these

20. If the first box, containing the label BC was opened and it was found that one item is a Ball, which of the following would be definitely true ?
(*a*) The other item may either be a Ball or a Clip.
(*b*) The other box with BB label will contain a Ball and a Clip.
(*c*) The other item will not be a Ball.
(*d*) The other item will also be a Ball.
(*e*) None of these

21. If the information is available that box PC does not contain either any Pin or any Clip and box PP does not contain any Pin and box CC contains one Clip and one Ball, which of the following will definitely be true if only one of the remaining boxes is opened ?
(*a*) It will have one Pin and one Clip.
(*b*) It will have atleast one Clip.
(*c*) It will have two Pins.
(*d*) It will have atleast one Pin.
(*e*) None of these

22. If the box PP contained two Clips, the box CC contained two Pins and the box BB contained atleast one Ball, which of the following will definitely be not true ?
(*a*) The box BC contains one Pin and one Clip.
(*b*) The box BB contains one Ball and one Clip.
(*c*) The box BC contains two Balls.
(*d*) The box PC contains two Balls.
(*e*) The box BB contains one Clip.

Directions : ***Questions 23 to 29 are based on the following information :***
(Hotel Management, 1998)

Priya and Promila are fast friends. Priya's father, Prem, is a police officer while Promila's father, Somesh, is an engineer. Prem and Somesh have a common friend in Rohan who has two children, Kunal and Renu. Priya and Kunal are college fellows while Promila and Renu are in the same class and study in another college. Promila and Kunal are good debaters and represent their colleges in inter-college debates. Renu writes poems while Priya is a good singer. Somesh is very proud of his daughter and often talks to his friends about her special talent in painting. Renu's father is a businessman and stays in the same locality where Prem stays while Somesh, who stays in another locality, is more intimate with Prem than with Rohan. Families of all the three persons stay with them.

In each of the following questions, two statements P and Q are given.

Mark your answer as (a) if both P and Q are true; (b) if one of the two is true and the other is wrong; (c) if both the statements are wrong; and (d) if it is not possible to draw any conclusion about the correctness or otherwise of either or both P and Q on the basis of information available in the above statement.

23. P : Priya and Promila read in different colleges.
Q : Promila is a good debater as also a good painter.

24. P : Rohan is an electronics engineer.
Q : Priya and Kunal are class-fellows.

25. P : Priya and Renu are college-fellows.
Q : Promila's father is more intimate with Renu's father than with Priya's father.

26. P : Somesh is a civil engineer.
Q : Priya and Renu are good debaters and represent their colleges in inter-college debates.

27. P : Rohan is a businessman.
Q : Renu and Priya stay in the same locality.

28. P : Promila's special talent has impressed her father very much.
Q : Rohan and Somesh stay in the same locality.

29. P : Rohan and Prem stay in the same locality.
Q : Renu and Kunal stay in the same locality.

Directions (*Questions 30 to 39*) : *Read the following passage carefully and answer the questions that follow :* **(M.B.A. 1997)**

Score Card of the final match of Sharjah Singer Cup 1996 is given below :

SCORE BOARD

Pakistan : Saeed Anwar c Fleming b Vaughan 1; Aamir Sohail st Germon b Patel 16; Shahid Afridi c Greatbatch b Larsen 21; Ijaz Ahmed c Fleming b Astle 10; Salim Malik lbw Cairns 40; Azam Khan c Greatbatch b Harris 22; Moin Khan lbw Cairns 32; Wasim Akram c Vaughan b Patel 0; Saqlain Mushtaq lbw Harris 0; Waqar Younis run out 0; Mushtaq Ahmed not out 4.

Extras : (lb-12, w-2); 14

Total : (all out in 48.5 overs); 160

Fall of wickets : 1-4, 2-32, 3-51, 4-63, 5-116, 6-120, 7-120, 8-138, 9-145.

Bowling : Vaughan 8-0-33-1; Larsen 9-1-22-1; Cairns 9.5-0-24-2; Astle 3-0-7-1; Harris 9-2-32-2; Patel 10-2-30-2.

New Zealand : Bryan Young b Akram 5; Mark Greatbatch c Ijaz b Mushtaq 52; Adam Parore lbw Saqlain 22; Nathan Astle c Mushtaq b Saqlain 8; Stephen Fleming lbw Younis 4; Chris Cairns lbw Akram 8; Chris Harris c Afridi b Mushtaq 2; Lee Germon lbw Akram 5; Dipak Patel lbw Afridi 1; Justin Vaughan not out 1; Gavin Larsen b Afridi 0.

Extras : (w-5, nb-6); 11

Total : (all out in 36.5 overs); 119

Fall of wickets : 1-7, 2-66, 3-81, 4-98, 5-102, 6-111, 7-114, 8-117, 9-119.

Bowling : Akram 8-1-20-3; Younis 8-0-22-1; Saqlain 8-0-32-2; Afridi 2.5-0-14-2; Mushtaq 10-0-31-2.

30. How many Pakistani batsmen were bowled by bowlers of New Zealand ?
(*a*) 0 (*b*) 1 (*c*) 2 (*d*) 3

31. Highest runs were scored in the match by the partnership of
(*a*) Aamir Sohail and Shahid Afridi (*b*) Mark Greatbatch and Adam Parore
(*c*) Moin Khan and Azam Khan (*d*) Salim Malik and Azam Khan

32. If runs per wicket is the criterion for evaluating bowling performance, then which bowler had the best bowling performance in the match ?
(*a*) Astle (*b*) Younis (*c*) Afridi (*d*) Akram

33. If number of balls per wicket is considered to evaluate bowling performance, then who was the best bowler of the match ?
(*a*) Patel (*b*) Larsen (*c*) Afridi (*d*) Akram

34. Performance of which bowlers were the same, where criterion for evaluation is number of runs per wicket ?

I. Harris and Saqlain II. Afridi and Harris

(*a*) Both I and II are true (*b*) I is true but II is false

(*c*) Both I and II are false (*d*) II is true but I is false

35. Which bowler of Pakistan had the worst bowling performance considering number of balls per wicket as the criterion ?

(*a*) Afridi (*b*) Younis (*c*) Mushtaq (*d*) Saqlain

36. How many leg before wickets were given in the match ?

(*a*) 6 (*b*) 7 (*c*) 8 (*d*) 9

37. Who was run out in the match ?

(*a*) Waqar Younis (*b*) Justin Vaughan

(*c*) Azam Khan and Waqar Younis (*d*) None of these

38. Who took maximum number of catches in the match ?

I. Stephen Fleming II. Mark Greatbatch III. Ijaz Ahmed

(*a*) I and II are true but III is false (*b*) Only II is true

(*c*) II and III are true but I is false (*d*) All are true

39. Which of the following statements is false ?

(*a*) Last wicket partnership of Pakistan added 15 runs.

(*b*) Only two were given stumped out in the match.

(*c*) Last wicket partnership of New Zealand could not add any run.

(*d*) Runs scored by the seventh wicket partnership of New Zealand were same as the runs scored by the eighth wicket partnership of New Zealand.

ANSWERS

Questions 1 to 10

Before exchange

Person	*Item*	*Worth*	*Quantity*	*Value*	*Total cost*
A	Chessboard Record player	Rs 500 Rs 2000	2 1	Rs 1000 Rs 2000	Rs 3000
B	Cricket bat	Rs 700	3	Rs 2100	Rs 2100
C	Cycle Walkman	Rs 1000 Rs 700	1 1	Rs 1000 Rs 700	Rs 1700
D	Camera 1 Camera 2	Rs 1500 Rs 3500	1 1	Rs 1500 Rs 3500	Rs 5000

After exchange

Person	*Item*	*Worth*	*Quantity*	*Value*	*Total cost*
A	Cycle Chessboard	Rs 1000 Rs 500	1 1	Rs 1000 Rs 500	Rs 1500
B	Record player Cricket bat	Rs 2000 Rs 700	1 1	Rs 2000 Rs 700	Rs 2700
C	Cricket bat Camera 1 Chessboard	Rs 700 Rs 1500 Rs 500	1 1 1	Rs 700 Rs 1500 Rs 500	Rs 2700
D	Cricket bat Walkman Camera 2	Rs 700 Rs 700 Rs 3500	1 1 1	Rs 700 Rs 700 Rs 3500	Rs 4900

1. (*a*) : A did not have a cricket bat after the exchange.

2. (*d*) : Before exchange, C had items worth Rs 1700.

3. (*b*) : A had a cycle, which no one else had.

4. (*d*) : At the beginning, D had the costliest items worth Rs 5000.

5. (*a*) : Clearly, B received a record player from A.

6. (*c*) : After exchange of items, B had a cricket bat and a record player.

7. (*a*) : After exchange, A had items worth Rs 1500.

8. (*b*) : Only A and D incurred losses in the deal.
Loss incurred by A = Rs (3000 – 1500) = Rs 1500.
Loss incurred by D = Rs (5000 – 4900) = Rs 100.

9. (*c*) : Clearly, B and C made profit after the exchange.
B's profit = Rs (2700 – 2100) = Rs 600.
C's profit = Rs (2700 – 1700) = Rs 1000.

10. (*b*) : Clearly, after exchange, D had a cricket bat, a walkman and a camera.

Questions 11 to 13

We have : $(A + B) > (C + D)$ ...(*i*)

$(A + C) = (B + D)$ ...(*ii*)

$A = \frac{1}{2}(B + D)$ ... (*iii*)

Putting $A = \frac{1}{2}(B + D)$ in (*ii*), we get $C = \frac{1}{2}(B + D)$. So, $A = C$.

Since $(A + B) > (C + D)$ and $A = C$ so $B > D$.

Thus, from (*iii*), we get $B > A$ and so $B > C$.

11. (*b*) : Clearly, B has the highest income.

12. (*a*) : Clearly, B earns more than A. So, (*a*) is false.

13. (*d*) : $A = 80000 = \frac{1}{2}(B + D)$ or $B + D = 2A = 160000$ ...(*iv*)

Also, $B - D = A = 80000$ ...(*v*)

Adding (*iv*) and (*v*), we get : $2B = 240000$ or $B = 120000$.

Questions 14 to 18

Given : E is oldest, A > B, C > D.

Thus, we have the following possible arrangements :

22		21		20		19		18		17	
E	>	A	>	B	>	F	>	C	>	D	...(*i*)
E	>	A	>	C	>	B	>	F	>	D	...(*ii*)
E	>	A	>	B	>	C	>	F	>	D	...(*iii*)
E	>	A	>	C	>	D	>	F	>	B	...(*iv*)
E	>	C	>	D	>	F	>	A	>	B	...(*v*)
E	>	C	>	D	>	A	>	F	>	B	...(*vi*)
E	>	C	>	A	>	B	>	F	>	D	...(*vii*)
E	>	C	>	A	>	D	>	F	>	B	...(*viii*)

14. (*a*) : Clearly, D is 20 years old in (*v*) and (*vi*). So, (*a*) is possible.
F is 18 years old in (*ii*), (*iii*), (*iv*), (*vi*), (*vii*), (*viii*). So, (*b*) is possible.
F is 19 years old in (*i*) and (*v*). So, (*c*) is possible.
But F is not 20 years old by any of the possibilities. So, (*d*) is not possible.

15. (*b*) : B is 17 years old in (*iv*), (*v*), (*vi*) and (*viii*).
In (*iv*), D's age is 19 years and C's age is 20 years.

In (*v*) and (*vi*), D's age is 20 years and C's age is 21 years.

In (*viii*), D's age is 19 years and C's age is 21 years.

16. (*d*) : There is a gap of two persons between C and F in (*vi*), (*vii*) and (*viii*) and in each of these cases, F is 18 years old.

17. (*a*) : Clearly, A is one year older than C in only two arrangements — (*ii*) and (*iv*).

18. (*c*) : Clearly, from (*iii*), it follows that if C is 19 years old, B is 20 years old and A is 21.

19. (*e*) : The information given is insufficient as to derive a particular conclusion. So, none of the given conclusions follows.

20. (*d*) : Since one item in the box is a Ball, so the box labelled BC may be, in fact, BB or BC. But it cannot be BC because it is given that no box contains the correct label. Thus, the box is BB and so the other item in it will also be a Ball.

21. (*d*) : Since the box PC does not contain a Pin or a Clip, so it is in fact the box BB and contains two Balls.

Since the box PP does not contain any Pin, so it is in fact either box BC or CC.

Since the box CC contains one Clip and one Ball, it is in fact box BC.

So, the box labelled PP is in fact box CC.

Now, the remaining two boxes are PP and PC. Thus, if any of them is opened, it will definitely contain one Pin.

22. (*c*) : Since box PP contains two Clips, it is in fact box CC.

Since box CC contains two Pins, it is in fact box PP.

Since box BB contains one Ball and no box carries the correct label, it is in fact box BC.

Now, remain the boxes labelled PC and BC which are in fact BB and PC.

Since no box carries the correct label, so box PC is in fact BB, and box BC is in fact PC. Thus, box BC contains one Pin and one Clip. So, (*c*) is false.

23. (*a*) : Clearly, Priya and Kunal study in the same college, and Promila and Renu study in the same class in a different college. So, P is true.

It is given that Promila is a good debater and Somesh's daughter (Promila) is good at painting. So, Q is also true.

24. (*c*) : Clearly, Renu's father, Rohan is a businessman. So, P is false.

Also, Priya and Kunal are college-fellows. So, Q is also not true.

25. (*c*) : Priya and Renu study in different colleges. So, P is false.

Promila's father, Somesh is more intimate with Priya's father, Prem than with Renu's father, Rohan. So, Q is also false.

26. (*d*) : It is mentioned that Somesh is an engineer. But that he is a civil engineer cannot be said for sure.

Also, Promila and Kunal are good debaters. So, Q is false.

27. (*a*) : According to the given information, Renu's father Rohan is a businessman. So, P is true.

Also, it is given that Renu's father and Prem stay in the same locality. This means that Renu and Prem's daughter, Priya stay in the same locality. So, Q is also true.

28. (*b*) : It is given that Somesh is much impressed with his daughter Promila's talent in painting. So, P is true.

Also, Renu's father, Rohan and Prem stay in the same locality while Somesh stays in another locality. So, Q is false.

29. (*a*) : Clearly, P is true.

Also, Renu and Kunal are both children of Rohan and so they live in the same locality. Thus, Q is also true.

30. (*a*) : Clearly, none of the Pakistani batsmen was bowled by bowlers of New Zealand.

31. (*b*) : From the section 'Fall of wickets' for Pakistan, we find that
the second and third players *i.e.* Aamir Sohail and Shahid Afridi together made (32 – 4) = 28 runs; the fifth and sixth players *i.e.* Salim Malik and Azam Khan together made (116 – 63) = 53 runs; the sixth and seventh players *i.e.* Azam Khan and Moin Khan made (120 – 116) *i.e.* 4 runs.
Similarly, in New Zealand team, the second and third players *i.e.* Mark Greatbatch and Adam Parore together made (66 – 7) *i.e.* 59 runs.

32. (*d*) : The bowler with the lowest value of runs per wicket would be the best performer.
From the 'Bowling' section, we find that runs per wicket for :

$$\text{Astle} = \frac{7}{1} = 7\,; \quad \text{Younis} = \frac{22}{1} = 22\,; \quad \text{Afridi} = \frac{14}{2} = 7\,; \quad \text{Akram} = \frac{20}{3} = 6.67$$

33. (*c*) : Clearly, the bowler with the lowest value of number of balls per wicket, would be considered the best.
From the 'Bowling section', we find that number of balls per wicket for :

$$\text{Patel} = \frac{10 \text{ overs}}{2 \text{ wickets}} = \frac{60 \text{ balls}}{2 \text{ wickets}} = 30 \text{ balls/wkt.}$$

$$\text{Larsen} = \frac{9 \text{ overs}}{1 \text{ wicket}} = 54 \text{ balls/wkt.}$$

$$\text{Afridi} = \frac{2.5 \text{ overs}}{2 \text{ wickets}} = \frac{15 \text{ balls}}{2 \text{ wickets}} = 7.5 \text{ balls/wkt.}$$

$$\text{Akram} = \frac{8 \text{ overs}}{3 \text{ wickets}} = \frac{48 \text{ balls}}{3 \text{ wickets}} = 16 \text{ balls/wkt.}$$

34. (*b*) : From the 'Bowling' section, we find that number of runs per wicket for :

$$\text{Harris} = \frac{32}{2} = 16\,; \quad \text{Saqlain} = \frac{32}{2} = 16\,; \quad \text{Afridi} = \frac{14}{2} = 7\,; \quad \text{Harris} = \frac{32}{2} = 16.$$

So, the performances of Harris and Saqlain are the same.

35. (*b*) : Clearly, the bowler with the highest value of number of balls per wicket would be the worst performer.
Now, number of balls per wicket for :

$$\text{Afridi} = \frac{2.5 \text{ overs}}{2 \text{ wickets}} = \frac{15 \text{ balls}}{2 \text{ wickets}} = 7.5 \text{ balls/wkt.;}$$

$$\text{Younis} = \frac{8 \text{ overs}}{1 \text{ wicket}} = 48 \text{ balls/wkt.;}$$

$$\text{Mushtaq} = \frac{10 \text{ overs}}{2 \text{ wickets}} = \frac{60 \text{ balls}}{2 \text{ wickets}} = 30 \text{ balls/wkt.;}$$

$$\text{Saqlain} = \frac{8 \text{ overs}}{2 \text{ wickets}} = \frac{48 \text{ balls}}{2 \text{ wickets}} = 24 \text{ balls/wkt.}$$

36. (*c*) : Clearly, leg before wickets (lbw) decisions were given in 8 cases : Salim Malik, Moin Khan, Saqlain Mushtaq, Adam Parore, Stephen Fleming, Chris Cairns, Lee Germon and Dipak Patel.

37. (*a*) : Clearly, only Waqar Younis was run out in the match.

38. (*a*) : From Pakistan's score, we find that :
Stephen Fleming took the catch of Saeed Anwar and Ijaz Ahmed *i.e.* 2 catches.
Mark Greatbatch took the catch of Shahid Afridi and Azam Khan *i.e.* 2 catches.
From New Zealand's score, we find that :
Ijaz Ahmed took the catch of Mark Greatbatch *i.e.* only 1 catch.

39. (*b*) : Clearly, only one (Aamir Sohail) was given stumped out in the match.

EXERCISE 61

(TRY YOURSELF)

1. Six roads lead to a country. They may be indicated by letters X, Y, Z and digits 1, 2, 3. When there is storm, Y is blocked. When there are floods, X, 1 and 2 will be affected. When road 1 is blocked, Z also is blocked. At a time when there are floods and a storm also blows, which road(s) can be used ?

(*a*) Only Y (*b*) Only Z (*c*) Only 3 (*d*) Z and 2

(I.A.S. 1996)

2. Six persons A, B, C, D, E and F are standing in a circle. B is between F and C; A is between E and D; F is to the left of D. Who is between A and F ?

(*a*) B (*b*) C (*c*) D (*d*) E

(M.B.A. 1998)

Directions (*Questions 3-4*) : *Read the following information carefully and answer the questions given below it :* **(Assistant Grade, 1998)**

(*i*) Mohan and Sumit are good in Chemistry and Biology.
(*ii*) Ashish and Mohan are good in Biology and Physics.
(*iii*) Ashish, Pratap and Neeraj are good in Physics and History.
(*iv*) Neeraj and Ashish are good in Physics and Mathematics.
(*v*) Pratap and Sumit are good in History and Chemistry.

3. Who is good in Physics, History and Mathematics, but not in Biology ?

(*a*) Pratap (*b*) Ashish (*c*) Mohan (*d*) Neeraj

4. Who is good in History, Physics, Biology and Mathematics ?

(*a*) Ashish (*b*) Neeraj (*c*) Pratap (*d*) Mohan

Directions (*Questions 5 to 8*) : *Study the information given below and answer the questions that follow :* **(M.B.A. 1997)**

There are four friends A, B, C, D. One of them is a cricketer and studies Chemistry and Biology. A and B play football. Both football players study Maths. D is a boxer. One football player also studies Physics. The boxer studies Maths and Accounts. All the friends study two subjects each and play one game each.

5. Who is the cricketer ?

(*a*) A (*b*) B (*c*) C (*d*) D

6. Who studies Accounts and plays football ?

(*a*) A (*b*) B (*c*) D (*d*) A or B

7. Who studies Physics ?

(*a*) A or B (*b*) A (*c*) B (*d*) D

8. How many games are played and subjects studied by the four friends ?

(*a*) 1 game and 4 subjects (*b*) 2 games and 3 subjects
(*c*) 3 games and 4 subjects (*d*) 3 games and 5 subjects

Directions (*Questions 9 to 11*) : *Read the following information and answer the questions given below it :* **(Bank P.O. 1998)**

(*i*) Sanchit, Kamal, Rahul, Madan and Tarun are five friends who stay in one building.
(*ii*) Each one owns a separate garage A, B, C, D and E and a different coloured car *viz.*, Red, Yellow, White, Black and Blue.

(*iii*) Kamal does not own either garage D or E. His car is of red colour.
(*iv*) Madan owns yellow coloured car and garage C.
(*v*) Tarun who owns garage A does not own black or white coloured car.

9. Who owns garage D ?
(*a*) Sanchit (*b*) Rahul (*c*) Either Sanchit or Rahul
(*d*) Owner of blue car (*e*) None of these

10. Who is the owner of blue coloured car ?
(*a*) Sanchit (*b*) Rahul (*c*) Tarun
(*d*) Data inadequate (*e*) None of these

11. Which of the following combinations of colour of car and garage is correct ?
(*a*) Blue — A (*b*) White — D (*c*) Red — B
(*d*) Black — D (*e*) None of these

Directions (*Questions 12 to 15*) : *Read the following information carefully and answer the questions given below it :* **(Bank P.O. 1997)**

(*i*) P, Q, R, S, T and U are six members of a family, each of them engaged in a different profession — Doctor, Lawyer, Teacher, Engineer, Nurse, Manager.
(*ii*) Each of them remains at home on a different day of the week from Monday to Saturday.
(*iii*) The Lawyer in the family remains at home on Thursday.
(*iv*) R remains at home on Tuesday.
(*v*) P, the Doctor does not remain at home either on Saturday or on Wednesday.
(*vi*) S is neither the Doctor nor the Teacher and remains at home on Friday.
(*vii*) Q is the Engineer and T is the Manager.

12. Who remains at home on Saturday ?
(*a*) Q or T (*b*) R (*c*) S (*d*) T (*e*) None of these

13. Which of the following combinations is not correct ?
(*a*) Q — Engineer (*b*) R — Teacher (*c*) S — Nurse
(*d*) T — Manager (*e*) All are correct

14. Who among them remains at home on the following day of the Nurse ?
(*a*) Q (*b*) Q or T (*c*) R (*d*) S (*e*) None of these

15. Which of the following combinations is correct ?
(*a*) Manager — Friday (*b*) Lawyer — Thursday (*c*) Nurse — Friday
(*d*) Teacher — Wednesday (*e*) Engineer — Thursday

Directions (*Questions 16 to 18*) : *Study the information given below and answer the questions that follow :* **(Bank P.O. 1998)**

(*i*) Six friends A, B, C, D, E and F are seated in a circle facing each other.
(*ii*) A is between D and B and F is between C and E.
(*iii*) C is third to the left of B.

16. Who is between B and F ?
(*a*) C (*b*) D (*c*) E (*d*) Cannot be determined (*e*) None of these

17. Who is between F and D ?
(*a*) D (*b*) E (*c*) B (*d*) Cannot be determined (*e*) None of these

18. Which of the following is the position of A in relation to F ?

(*a*) Second to the right (*b*) Second to the left

(*c*) Third to the right (*d*) Fourth to the right

(*e*) None of these

19. Seven students A, B, C, D, E, F and G are sitting in a row. C is sitting between A and D. E is between F and G and B is between D and F. A and G are at the two ends. D is sitting between **(C.B.I. 1997)**

(*a*) A and B (*b*) B and E (*c*) C and B (*d*) C and F

Directions (*Questions 20 to 24*) : *Read the following information carefully and answer the questions given below it :* **(Hotel Management, 1997)**

From a group of six boys M, N, O, P, Q, R and five girls G, H, I, J, K, a team of six is to be selected. Some of the criteria of selection are as follows :

M and J go together.

O cannot be placed with N.

I cannot go with J.

N goes with H.

P and Q have to be together.

K and R go together.

Unless otherwise stated, these criteria are applicable to all the following questions :

20. If the team consists of two girls and I is one of them, the other members are

(*a*) GMRPQ (*b*) HNOPQ (*c*) KOPQR (*d*) KRMNP

21. If the team has four boys including O and R, the members of the team other than O and R are

(*a*) HIPQ (*b*) GKPQ (*c*) GJPQ (*d*) GJMP

22. If four members are boys, which of the following cannot constitute the team ?

(*a*) GJMOPQ (*b*) HJMNPQ (*c*) JKMNOR (*d*) JKMPQR

23. If both K and P are members of the team and three boys in all are included in the team, the members of the team other than K and P are

(*a*) GIRQ (*b*) GJRM (*c*) HIRQ (*d*) IJRQ

24. If the team has three girls including J and K, the members of the team other than J and K are

(*a*) GHNR (*b*) MNOG (*c*) MORG (*d*) NHOR

25. Shekhar is taller than Kunal. Atul is taller than Pawan but not as tall as Kunal. Prashant is taller than Shekhar. Who among them is the shortest ?

(*a*) Pawan (*b*) Kunal (*c*) Shekhar (*d*) Atul

(M.B.A. 1998)

26. Seven persons P, Q, R, S, T, U and V participate in and finish all the events of a series of swimming races. There are no ties at the finish of any of the events. V always finishes somewhere ahead of P. P always finishes somewhere ahead of Q. Either R finishes first and T finishes last or S finishes first and U or Q finishes last. If in a particular race V finished fifth, then which one of the following would be true ? **(I.A.S. 1997)**

(*a*) R finishes second. (*b*) R finishes fourth.

(*c*) S finishes first. (*d*) T finishes third.

27. There are five bus stops A, B, C, D and E at equal intervals. C is not the middle stop. A and E are not terminal stops. C comes twice as many stops before D in upward journey as B comes after A. D is the first stop in downward journey. Which of the following gives the correct sequence of the stops in downward journey ?

(*a*) DACEB (*b*) DAECB (*c*) DCBAE (*d*) DEACB

28. A, B, C, D, E and F, not necessarily in that order, are sitting on six chairs regularly placed around a round table. It is observed that : **(I.A.S. 1998)**

A is between D and F.

C is opposite D.

D and E are not on neighbouring chairs.

Which of the following pairs must be sitting on neighbouring chairs ?

(*a*) A and B (*b*) A and C (*c*) B and F (*d*) C and E

Directions (*Questions 29 to 33*) : *Read the following information carefully and answer the questions given below it :* **(M.A.T. 1997)**

There is a group of five persons A, B, C, D and E. In the group, there is a Professor of Philosophy, a Professor of Psychology and a Professor of Economics. A and D are ladies who have no specialisation in any subject and are unmarried. No lady is a philosopher or an economist. There is a married couple in the group of which E is the husband. B is the brother of C and is neither a psychologist nor an economist.

29. Who is the Professor of Psychology ?

(*a*) A (*b*) B (*c*) C (*d*) D

30. Which of the following groups includes all the men ?

(*a*) BC (*b*) BE (*c*) ABC (*d*) BCD

31. Who is the Professor of Philosophy ?

(*a*) D (*b*) B (*c*) C (*d*) A

32. Who is the wife of E ?

(*a*) C (*b*) D (*c*) A (*d*) B

33. Who is the Professor of Economics ?

(*a*) A (*b*) B (*c*) C (*d*) E

Directions (*Questions 34 to 38*) : *Study the information given below and answer the questions that follow :* **(Bank P.O. 1998)**

(*i*) Six plays A, B, C, D, E and F are to be organised from Monday to Saturday *i.e.* 5th to 10th — one play each day.

(*ii*) There are two plays between C and D and one play between A and C.

(*iii*) There is one play between F and E and E is to be organised before F.

(*iv*) B is to be organised before A, not necessarily immediately.

(*v*) The organisation does not start with B.

34. The organisation would start from which play ?

(*a*) A (*b*) D (*c*) F (*d*) Cannot be determined (*e*) None of these

35. On which date is play E to be organised ?

(*a*) 5th (*b*) 6th (*c*) 7th (*d*) Cannot be determined (*e*) None of these

36. The organisation would end with which play ?

(*a*) A (*b*) B (*c*) D (*d*) Cannot be determined (*e*) None of these

37. Which day is play B organised ?

(*a*) Tuesday (*b*) Thursday (*c*) Friday

(*d*) Cannot be determined (*e*) None of these

38. Which of the following is the correct sequence of organising plays ?

(*a*) AECFBD (*b*) BDEFCA (*c*) DFECBA

(*d*) Cannot be determined (*e*) None of these

ANSWERS

1. (*c*)	**2.** (*c*)	**3.** (*d*)	**4.** (*a*)	**5.** (*c*)	**6.** (*d*)	**7.** (*a*)	**8.** (*d*)	**9.** (*c*)	**10.** (*c*)
11. (*c*)	**12.** (*a*)	**13.** (*e*)	**14.** (*b*)	**15.** (*c*)	**16.** (*c*)	**17.** (*e*)	**18.** (*c*)	**19.** (*c*)	**20.** (*c*)
21. (*b*)	**22.** (*c*)	**23.** (*a*)	**24.** (*c*)	**25.** (*a*)	**26.** (*c*)	**27.** (*d*)	**28.** (*d*)	**29.** (*c*)	**30.** (*b*)
31. (*b*)	**32.** (*a*)	**33.** (*d*)	**34.** (*b*)	**35.** (*c*)	**36.** (*a*)	**37.** (*a*)	**38.** (*e*)		

7. SEQUENTIAL OUTPUT TRACING

In this type of questions, a message comprising of randomised words or numbers is given as the input followed by steps of rearrangement to give sequential outputs. The candidate is required to trace out the pattern in the given rearrangement and then determine the desired output step, according as is asked in the questions.

Example : ***Study the following information to answer the given questions :***

A word arrangement machine, when given an input line of words, rearranges them following a particular rule in each step. The following is an illustration of input and the steps of rearrangement : **(S.B.I.P.O. 1995)**

Input : As if it on an Zoo figure Of in at
Step I : an As if it on Zoo figure Of in at
Step II : an As at if it on Zoo figure Of in
Step III : an As at figure if it on Zoo Of in
Step IV : an As at figure if in it on Zoo Of
Step V : an As at figure if in it Of on Zoo

(and Step V is the last step for this Input).

As per the rules followed in the above steps, find out in the given questions the appropriate step for the given input.

1. Which of the following will be Step II for the given input ?

Input : am ace all if Is

(*a*) ace all am Is if (*b*) all am ace if Is (*c*) Is if am ace all
(*d*) ace all am if Is (*e*) None of these

2. **Input :** you are at fault on this

Which of the following steps would be — are at fault on you this ?

(*a*) I (*b*) II (*c*) III (*d*) IV (*e*) V

3. **Input :** Him and His either or her

Which step will be the last step for this input ?

(*a*) I (*b*) II (*c*) III (*d*) IV (*e*) V

4. Step IV was like this — an apple at cot was red on one side

Which of the following will definitely be the input ?

(*a*) was cot red an on at one apple side
(*b*) cot an at apple was red on one side
(*c*) apple at an cot was red on one side
(*d*) Cannot be determined
(*e*) None of these

Solution :

Clearly, in the given arrangement, the words have been arranged alphabetically in a sequence, altering the position of only one word in each step.

1. Clearly, we have :
Input : am ace all if Is
Step I : ace am all if Is
Step II : ace all am if Is
So, the answer is (*d*).

2. **Input :** you are at fault on this
Step I : are you at fault on this
Step II : are at you fault on this
Step III : are at fault you on this
Step IV : are at fault on you this
So, the answer is (*d*).

3. **Input :** Him and His either or her
Step I : and Him His either or her
Step II : and either Him His or her
Step III : and either her Him His or
Since all the words in the given input have been arranged alphabetically uptil Step III, so it is the last step.
Hence, the answer is (*c*).

4. Tracing the output steps for each of the given inputs, we find that Step IV for (*a*) is the same as that given in the questions, while in (*b*) and (*c*), the desired output occurred at Step III.
Input : was cot red an on at one apple side
Step I : an was cot red on at one apple side
Step II : an apple was cot red on at one side
Step III : an apple at was cot red on one side
Step IV : an apple at cot was red on one side
So, the answer is (*a*).

EXERCISE 7

Directions (*Questions 1 to 5*) : *Study the following information and answer the questions given below it :* **(Bank P.O. 1995)**

An electronic device when fed with the numbers, rearranges them in a particular order following certain rules. The following is a step-by-step process of rearrangement for the given input of numbers.

Input :	85	16	36	04	19	97	63	09
Step I :	97	85	16	36	04	19	63	09
Step II :	97	85	63	16	36	04	19	09
Step III :	97	85	63	36	16	04	19	09
Step IV :	97	85	63	36	19	16	04	09
Step V :	97	85	63	36	19	16	09	04

(For the given input step V is the last step).

1. Which of the following will be Step V for the given input ?
Input : 25 08 35 11 88 67 23
(*a*) 88 67 35 25 23 11 08
(*b*) 88 67 35 25 08 11 23
(*c*) 08 11 23 25 35 67 88
(*d*) 88 67 35 25 23 08 11
(*e*) None of these

2. Which of the following will be Step III for the given input ?
Input : 09 25 16 30 32 19 17 06
(*a*) 32 09 25 16 30 19 17 06 (*b*) 32 30 09 25 16 19 17 06
(*c*) 32 30 25 09 16 19 17 06 (*d*) 32 25 09 16 30 19 17 06
(*e*) None of these

3. Which of the following will be the last step for the given input ?
Input : 16 09 25 27 06 05
(*a*) I (*b*) II (*c*) III (*d*) IV (*e*) None of these

4. Which of the following will be the last step for the given input ?
Input : 03 31 43 22 11 09
(*a*) IV (*b*) V (*c*) VI
(*d*) Cannot be determined (*e*) None of these

5. If the Step IV is as given below, which of the following was the input ?
Step IV : 92 86 71 69 15 19 06 63 58
(*a*) 86 92 69 71 15 19 06 63 58 (*b*) 15 86 19 92 06 69 63 58 71
(*c*) 15 19 06 63 58 86 92 69 71 (*d*) Cannot be determined
(*e*) None of these

Directions (*Questions 6 to 10*) : *Study the following information and answer the given questions :* **(S.B.I.P.O. 1997)**

A word arrangement machine, when given an input line of words, rearranges them following a particular rule in each step. The following is an illustration of input and the steps of rearrangement.

Input : Go for to Though By easy To Access at
Step I : Access Go for to Though By easy To at
Step II : Access at Go for to Though By easy To
Step III : Access at By Go for to Though easy To
Step IV : Access at By easy Go for to Though To
Step V : Access at By easy for Go to Though To
Step VI : Access at By easy for Go Though to To
Step VII : Access at By easy for Go Though To to
(and Step VII is the last step for this input)

As per the rules followed in the above steps, find out in the given questions the appropriate step for the given input.

6. **Input :** story For around on was He at
Which of the following will be Step IV for the given input ?
(*a*) around at For He on was story (*b*) around at For He on story was
(*c*) around at For He story on was (*d*) around at He For story on was
(*e*) None of these

7. **Input :** every and peer to an for
Which of the following steps would be 'an and every for peer to' ?
(*a*) II (*b*) III (*c*) IV (*d*) V (*e*) None of these

8. **Input :** Together over series on feast the so
Which of the following steps will be the last but one ?
(*a*) II (*b*) III (*c*) IV (*d*) V (*e*) None of these

9. Input : Over Go For through at one
Which step number will be the last step of the above input ?
(*a*) III (*b*) V (*c*) VI (*d*) VII (*e*) None of these

10. The Step II of an input is as follows :
and Do pet to on that
Which of the following would definitely be the input ?
(*a*) Do on pet to and that (*b*) Do pet to and that on
(*c*) Do and pet to on that (*d*) Cannot be determined
(*e*) None of these

Directions (*Questions 11 to 15*) : *Study the following information and answer the questions given below it :* **(Bank P.O. 1998)**

The admission ticket for an exhibition bears a password which is changed after every clock hour based on set of words chosen for each day. The following is an illustration of the code and steps of rearrangement for subsequent clock hours. The time is 9 a.m. to 3 p.m.

Day's first password : First Batch — 9 a.m. to 10 a.m.
is not ready cloth simple harmony burning
Second Batch — 10 a.m. to 11 a.m.
ready not is cloth burning harmony simple
Third Batch — 11 a.m. to 12 noon
cloth is not ready simple harmony burning
Fourth Batch — 12 noon to 1 p.m.
not is cloth ready burning harmony simple
Fifth Batch — 1 p.m. to 2 p.m.
ready cloth is not simple harmony burning
and so on.

11. If the password for the first batch was — "rate go long top we let have", which batch will have the password — "go rate top long have let we"?
(*a*) Second (*b*) Third (*c*) Fourth (*d*) Fifth (*e*) None of these

12. *Day's first password* — "camel road no toy say me not".
What will be the password for fourth batch *i.e.* 12 noon to 1 p.m. ?
(*a*) road camel toy no not me say (*b*) no road camel toy not me say
(*c*) toy no road camel not me say (*d*) toy camel road no say me not
(*e*) None of these

13. If the batch 2 of the day has the password — "came along net or else key lot", what would be the password for batch 4 (*i.e.* 12 noon to 1 p.m.) ?
(*a*) net or came along else key lot (*b*) came or net along lot key else
(*c*) or net along came lot key else (*d*) along net or came else key lot
(*e*) None of these

14. If the password for 11 a.m. to 12 noon was — "soap shy miss pen yet the she", what was the password for the first batch ?
(*a*) pen miss shy soap she the yet (*b*) she miss pen soap yet the she
(*c*) soap pen miss shy she the yet (*d*) miss shy soap pen she the yet
(*e*) None of these

15. If the password for 6th batch *i.e.* 2 p.m. to 3 p.m. is — "are trap cut he but say lap", what will be the password for 2nd batch *i.e.* 10-11 a.m. ?

(*a*) trap are he cut lap say but (*b*) he cut trap are lap say but
(*c*) cut he are trap but say lap (*d*) are he cut trap lap say but
(*e*) None of these

ANSWERS

Questions 1 to 5

Clearly, in the given arrangement, the numbers have been arranged in descending order in a sequence, altering the position of only one number in each step.

1. (*a*) :

Input :	25	08	35	11	88	67	23
Step I :	88	25	08	35	11	67	23
Step II :	88	67	25	08	35	11	23
Step III :	88	67	35	25	08	11	23
Step IV :	88	67	35	25	23	08	11
Step V :	88	67	35	25	23	11	08

2. (*c*) :

Input :	09	25	16	30	32	19	17	06
Step I :	32	09	25	16	30	19	17	06
Step II :	32	30	09	25	16	19	17	06
Step III :	32	30	25	09	16	19	17	06

3. (*b*) :

Input :	16	09	25	27	06	05
Step I :	27	16	09	25	06	05
Step II :	27	25	16	09	06	05

Since all the numbers in the given input have been arranged in descending order uptil Step II, so it is the last step.

4. (*b*) :

Input :	03	31	43	22	11	09
Step I :	43	03	31	22	11	09
Step II :	43	31	03	22	11	09
Step III :	43	31	22	03	11	09
Step IV :	43	31	22	11	03	09
Step V :	43	31	22	11	09	03

5. (*c*) :

Input :	15	19	06	63	58	86	92	69	71
Step I :	92	15	19	06	63	58	86	69	71
Step II :	92	86	15	19	06	63	58	69	71
Step III :	92	86	71	15	19	06	63	58	69
Step IV :	92	86	71	69	15	19	06	63	58

Questions 6 to 10

In the given arrangement, the words have been arranged alphabetically in a sequence, altering the position of only one word in each step.

6. (*c*) :

Input :	story For around on was He at
Step I :	around story For on was He at
Step II :	around at story For on was He
Step III :	around at For story on was He
Step IV :	around at For He story on was

7. (*b*) :

Input :	every and peer to an for
Step I :	an every and peer to for
Step II :	an and every peer to for
Step III :	an and every for peer to

8. (*d*) : **Input :** Together over series on feast the so
Step I : feast Together over series on the so
Step II : feast on Together over series the so
Step III : feast on over Together series the so
Step IV : feast on over series Together the so
Step V : feast on over series so Together the
Step VI : feast on over series so the Together
Clearly, Step VI is the last step and V is the last but one (second last).

9. (*e*) : **Input :** Over Go For through at one
Step I : at Over Go For through one
Step II : at For Over Go through one
Step III : at For Go Over through one
Step IV : at For Go one Over through
Since all the words in the given input have been arranged alphabetically uptil Step IV, so it is the last step.

10. (*e*) : Clearly, none of the given inputs gives the desired output at Step II on rearrangement.

Questions 11 to 15

Clearly, the given arrangement is as under :
In the first step, the first three and the last three letters are written in a reverse order.
Then, the first four and the last three letters are written in a reverse order.
The process is repeated to obtain successive output steps.

11. (*c*) : *First batch :* rate go long top we let have
Second batch : long go rate top have let we
Third batch : top rate go long we let have
Fourth batch : go rate top long have let we

12. (*a*) : *First batch :* camel road no toy say me not
Second batch : no road camel toy not me say
Third batch : toy camel road no say me not
Fourth batch : road camel toy no not me say

13. (*d*) : *Second batch :* came along net or else key lot
Third batch : or net along came lot key else
Fourth batch : along net or came else key lot

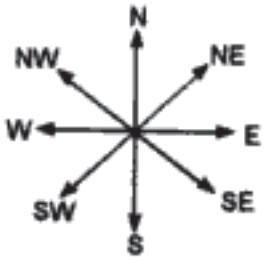
14. (*b*) : *Third batch :* soap shy miss pen yet the she
Second batch : pen miss shy soap she the yet
First batch : shy miss pen soap yet the she

15. (*c*) : *Sixth batch :* are trap cut he but say lap
Fifth batch : cut trap are he lap say but
Fourth batch : he are trap cut but say lap
Third batch : trap are he cut lap say but
Second batch : cut he are trap but say lap

8. DIRECTION SENSE TEST

In this test, the questions consist of a sort of direction puzzle. A successive follow-up of directions is formulated and the candidate is required to ascertain the final direction or the distance between two points. The test is meant to judge the candidate's ability to trace and follow correctly and sense the direction correctly.

The adjoining figure shows the four main directions (North N, South S, East E, West W) and four cardinal directions (North East NE, North West NW, South East SE, South West SW) to help the candidates know the directions.

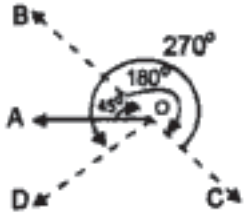


ILLUSTRATIVE EXAMPLES

Ex. 1. A man is facing west. He turns 45° in the clockwise direction and then another 180° in the same direction and then 270° in the anticlockwise direction. Which direction is he facing now ? **(Hotel Management, 1997)**

(*a*) South (*b*) North-west (*c*) West (*d*) South-west

Sol. Clearly, the man initially faces in the direction OA. On moving 45° clockwise, he faces in the direction OB. On further moving 180° clockwise, he faces in the direction OC. Finally, on moving 270° anticlockwise, he faces in the direction OD, which is South-west. Hence, the answer is (*d*).



Ex. 2. One day, Ravi left home and cycled 10 km southwards, turned right and cycled 5 km and turned right and cycled 10 km and turned left and cycled 10 km. How many kilometres will he have to cycle to reach his home straight ? **(Assistant Grade, 1995)**

(*a*) 10 km (*b*) 15 km (*c*) 20 km (*d*) 25 km

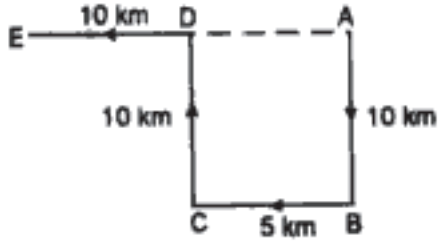
Sol. Clearly, Ravi starts from home at A, moves 10 km southwards upto B, turns right and moves 5 km upto C, turns right again and moves 10 km upto D and finally turns left and moves 10 km upto E.

Thus, his distance from initial position A

$= AE = AD + DE$

$= BC + DE = (5 + 10)$ km $= 15$ km.

Hence, the answer is (*b*).



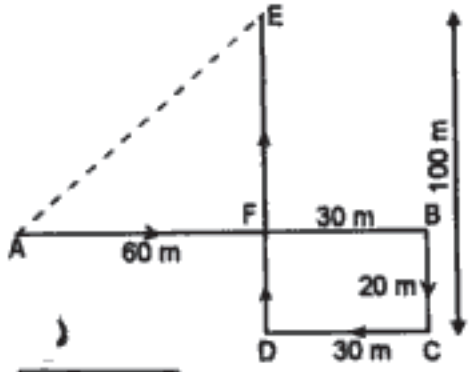
Ex. 3. A child is looking for his father. He went 90 metres in the east before turning to his right. He went 20 metres before turning to his right again to look for his father at his uncle's place 30 metres from this point. His father was not

there. From there, he went 100 metres to his north before meeting his father in a street. How far did the son meet his father from starting point ?

(Central Excise, 1996)

(*a*) 80 metres (*b*) 100 metres (*c*) 140 metres (*d*) 260 metres

Sol. Clearly, the child moves from A 90 m eastwards upto B, then turns right and moves 20 m upto C, then turns right and moves 30 m upto D. Finally, he turns right and moves 100 m upto E.



Clearly, AB = 90 m, BF = CD = 30 m.

So, AF = AB – BF = 60 m.

Also, DE = 100 m, DF = BC = 20 m.

So, EF = DE – DF = 80 m.

$\therefore$ His distance from starting point A = AE = $\sqrt{AF^2 + EF^2}$

$= \sqrt{(60)^2 + (80)^2}$

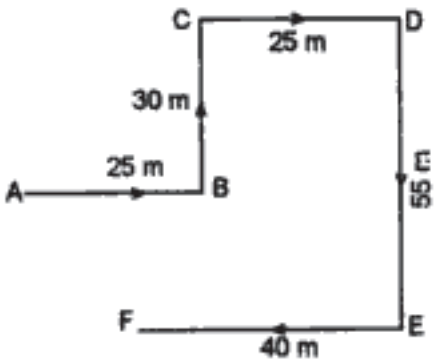
$= \sqrt{3600 + 6400} = \sqrt{10000} = 100$ m.

Hence, the answer is (*b*).

Ex. 4. Kailash faces towards north. Turning to his right, he walks 25 metres. He then turns to his left and walks 30 metres. Next, he moves 25 metres to his right. He then turns to his right again and walks 55 metres. Finally, he turns to the right and moves 40 metres. In which direction is he now from his starting point ?

(*a*) South-west (*b*) South (*c*) North-west (*d*) South-east

Sol. Kailash turns towards right from north direction. So, he walks 25 m towards east upto B, turns left and moves 30 m upto C, turns right and goes 25 m upto D. At D, he turns to right towards the south and walks 55 m upto E. Next, he again turns to right and walks 40 m upto F, which is his final position. F is to the south-east of A. So, he is to the south-east from his starting point. Hence, the answer is (*d*).



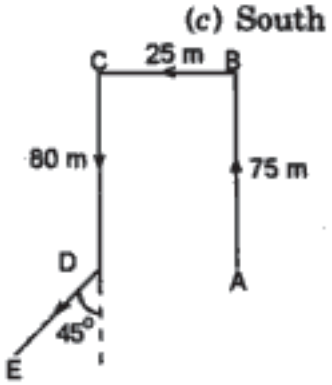
Ex. 5. Deepa moved a distance of 75 metres towards the north. She then turned to the left and walking for about 25 metres, turned left again and walked 80 metres. Finally, she turned to the right at an angle of 45°. In which direction was she moving finally ?

(*a*) North-east (*b*) North-west (*c*) South

(*d*) South-east (*e*) South-west

Sol. Deepa started from A, moved 75 m upto B, turned left and walked 25 m upto C. She then turned left again and moved 80 m upto D. Turning to the right at an angle of 45°, she was finally moving in the direction DE *i.e.*, South-west.

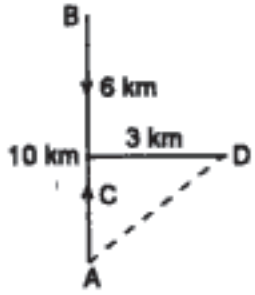
Hence, the answer is (*e*).



Ex. 6. Kunal walks 10 km towards North. From there he walks 6 km towards South. Then, he walks 3 km towards East. How far and in which direction is he with reference to his starting point ? **(M.B.A. 1998)**

(*a*) 5 km West (*b*) 7 km West (*c*) 7 km East (*d*) 5 km North-East

Sol. Clearly, Kunal moves from A 10 km northwards upto B, then moves 6 km southwards upto C, turns towards East and walks 3 km upto D.



Then, AC = (AB – BC) = (10 – 6) = 4 km;

CD = 3 km.

So, Kunal's distance from starting point A

$$= AD = \sqrt{AC^2 + CD^2} = \sqrt{4^2 + 3^2} = 5 \text{ km}.$$

Also, D is to the North-east of A.

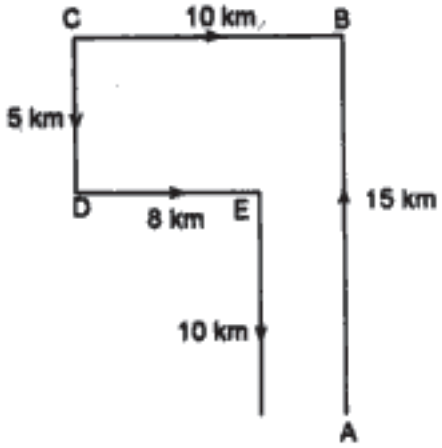
Hence, the answer is (*d*).

Ex. 7. Johnson left for his office in his car. He drove 15 km towards north and then 10 km towards west. He then turned to the south and covered 5 km. Further, he turned to the east and moved 8 km. Finally, he turned right and drove 10 km. How far and in which direction is he from his starting point ?

(*a*) 2 km West (*b*) 5 km East (*c*) 3 km North

(*d*) 6 km South (*e*) None of these

Sol. Clearly, Johnson drove 15 km from A to B northwards and then 10 km from B to C towards west. He then moves 5 km southwards from C to D and 8 km eastwards upto E. Finally, he turned right and moved 10 km upto F.



∴ A and F lie in the same straight line and F lies to the west of A.

So, Johnson's distance from the starting point A = AF = (BC – DE) = (10 – 8) km = 2 km.

Hence, the answer is (*a*).

EXERCISE 8A

1. A man is facing south. He turns 135° in the anticlockwise direction and then 180° in the clockwise direction. Which direction is he facing now ?

   (*a*) North-east (*b*) North-west (*c*) South-east (*d*) South-west

2. A man is facing north-west. He turns 90° in the clockwise direction and then 135° in the anticlockwise direction. Which direction is he facing now ?

   (*a*) East (*b*) West (*c*) North (*d*) South

   (Hotel Management, 1996)

3. A man is facing north-west. He turns 90° in the clockwise direction, then 180° in the anticlockwise direction and then another 90° in the same direction. Which direction is he facing now ? **(Hotel Management, 1997)**

   (*a*) South (*b*) South-west (*c*) West (*d*) South-east

4. I am facing east. I turn 100° in the clockwise direction and then 145° in the anticlockwise direction. Which direction am I facing now ?

(*a*) East (*b*) North-east (*c*) North (*d*) South-west

(Hotel Management, 1998)

5. Deepak starts walking straight towards east. After walking 75 metres, he turns to the left and walks 25 metres straight. Again he turns to the left, walks a distance of 40 metres straight, again he turns to the left and walks a distance of 25 metres. How far is he from the starting point ?

(*a*) 25 metres (*b*) 50 metres (*c*) 115 metres
(*d*) 140 metres (*e*) None of these

6. Kishenkant walks 10 kilometres towards North. From there, he walks 6 kilometres towards South. Then, he walks 3 kilometres towards East. How far and in which direction is he with reference to his starting point ? **(M.B.A. 1998)**

(*a*) 5 kilometres West (*b*) 5 kilometres North-east
(*c*) 7 kilometres East (*d*) 7 kilometres West

7. A man leaves for his office from his house. He walks towards East. After moving a distance of 20 m, he turns towards South and walks 10 m. Then he walks 35 m towards the West and further 5 m towards the North. He then turns towards East and walks 15 m. What is the straight distance in metres between his initial and final positions ?

(*a*) 0 (*b*) 5 (*c*) 10
(*d*) Cannot be determined (*e*) None of these

8. Gaurav walks 20 metres towards North. He then turns left and walks 40 metres. He again turns left and walks 20 metres. Further, he moves 20 metres after turning to the right. How far is he from his original position ?

(*a*) 20 metres (*b*) 30 metres (*c*) 50 metres
(*d*) 60 metres (*e*) None of these **(Bank P.O. 1997)**

9. Radha moves towards South-east a distance of 7 km, then she moves towards West and travels a distance of 14 m. From here, she moves towards North-west a distance of 7 m and finally she moves a distance of 4 m towards East and stood at that point. How far is the starting point from where she stood ?

(*a*) 3 m (*b*) 4 m (*c*) 10 m (*d*) 11 m

(I. Tax & Central Excise, 1995)

10. Gopal starts from his house towards West. After walking a distance of 30 metres, he turned towards right and walked 20 metres. He then turned left and moving a distance of 10 metres, turned to his left again and walked 40 metres. He now turns to the left and walks 5 metres. Finally he turns to his left. In which direction is he walking now ?

(*a*) North (*b*) South (*c*) East (*d*) South-west (*e*) West

11. A rat runs 20′ towards East and turns to right, runs 10′ and turns to right, runs 9′ and again turns to left, runs 5′ and then turns to left, runs 12′ and finally turns to left and runs 6′. Now, which direction is the rat facing ?

(*a*) East (*b*) West (*c*) North (*d*) South

(Assistant Grade, 1996)

12. A girl leaves from her home. She first walks 30 metres in North-west direction and then 30 metres in South-west direction. Next, she walks 30 metres in South-east direction. Finally, she turns towards her house. In which direction is she moving ?

(*a*) North-east (*b*) North-west (*c*) South-east
(*d*) South-west (*e*) None of these

13. Sanjeev walks 10 metres towards the South. Turning to the left, he walks 20 metres and then moves to his right. After moving a distance of 20 metres, he turns to the right and walks 20 metres. Finally, he turns to the right and moves a distance of 10 metres. How far and in which direction is he from the starting point ?

(*a*) 10 metres North (*b*) 20 metres South (*c*) 20 metres North
(*d*) 10 metres South (*e*) None of these

14. Kashish goes 30 metres North, then turns right and walks 40 metres, then again turns right and walks 20 metres, then again turns right and walks 40 metres. How many metres is he from his original position ?

(*a*) 0 (*b*) 10 (*c*) 20 (*d*) 40 (*e*) None of these

15. I am facing South. I turn right and walk 20 m. Then I turn right again and walk 10 m. Then I turn left and walk 10 m and then turning right walk 20 m. Then I turn right again and walk 60 m. In which direction am I from the starting point ? **(Hotel Management, 1998)**

(*a*) North (*b*) North-west (*c*) East (*d*) North-east

16. A man walks 30 metres towards South. Then, turning to his right, he walks 30 metres. Then, turning to his left, he walks 20 metres. Again, he turns to his left and walks 30 metres. How far is he from his initial position ?

(*a*) 20 metres (*b*) 30 metres (*c*) 60 metres
(*d*) 80 metres (*e*) None of these

17. Rohit walked 25 metres towards South. Then he turned to his left and walked 20 metres. He then turned to his left and walked 25 metres. He again turned to his right and walked 15 metres. At what distance is he from the starting point and in which direction ? **(Bank P.O. 1996)**

(*a*) 35 metres East (*b*) 35 metres North (*c*) 40 metres East
(*d*) 60 metres East (*e*) None of these

18. Starting from a point P, Sachin walked 20 metres towards South. He turned left and walked 30 metres. He then turned left and walked 20 metres. He again turned left and walked 40 metres and reached a point Q. How far and in which direction is the point Q from the point P ? **(Bank P.O. 1992)**

(*a*) 20 metres West (*b*) 10 metres East (*c*) 10 metres West
(*d*) 10 metres North (*e*) None of these

19. Ramakant walks northwards. After a while, he turns to his right and a little further to his left. Finally, after walking a distance of one kilometre, he turns to his left again. In which direction is he moving now ?

(*a*) North (*b*) South (*c*) East (*d*) West

20. A man walks 1 km towards East and then he turns to South and walks 5 km. Again he turns to East and walks 2 km, after this he turns to North and walks 9 km. Now, how far is he from his starting point ? **(M.B.A. 1998)**

(*a*) 3 km (*b*) 4 km (*c*) 5 km (*d*) 7 km

21. Raj travelled from a point X straight to Y at a distance of 80 metres. He turned right and walked 50 metres, then again turned right and walked 70 metres. Finally, he turned right and walked 50 metres. How far is he from the starting point ?

(*a*) 10 metres (*b*) 20 metres (*c*) 50 metres
(*d*) 70 metres (*e*) None of these

22. Laxman went 15 kms to the west from my house, then turned left and walked 20 kms. He then turned East and walked 25 kms and finally turning left covered 20 kms. How far was he from his house ?

(*a*) 5 kms (*b*) 10 kms (*c*) 40 kms (*d*) 80 kms

23. From his house, Lokesh went 15 kms to the North. Then he turned West and covered 10 kms. Then, he turned South and covered 5 kms. Finally, turning to East, he covered 10 kms. In which direction is he from his house ?

(*a*) East (*b*) West (*c*) North (*d*) South

(C.B.I. 1996)

24. Going 50 m to the South of her house, Radhika turns left and goes another 20 m. Then, turning to the North, she goes 30 m and then starts walking to her house. In which direction is she walking now ?

(*a*) North-west (*b*) North (*c*) South-east (*d*) East

25. A walks 10 metres in front and 10 metres to the right. Then every time turning to his left, he walks 5, 15 and 15 metres respectively. How far is he now from his starting point ?

(*a*) 5 metres (*b*) 10 metres (*c*) 15 metres
(*d*) 20 metres (*e*) 23 metres

26. Rasik walks 20 m North. Then he turns right and walks 30 m. Then he turns right and walks 35 m. Then he turns left and walks 15 m. Then he again turns left and walks 15 m. In which direction and how many metres away is he from his original position ? **(C.B.I. 1997)**

(*a*) 15 metres West (*b*) 30 metres East
(*c*) 30 metres West (*d*) 45 metres East

27. A child is looking for his father. He went 90 metres in the East before turning to his right. He went 20 metres before turning to his right again to look for his father at his uncle's place 30 metres from this point. His father was not there. From here he went 100 metres to the North before meeting his father in a street. How far did the son meet his father from the starting point ?

(*a*) 80 metres (*b*) 100 metres (*c*) 140 metres (*d*) 260 metres

(I. Tax & Central Excise, 1996)

28. The door of Aditya's house faces the East. From the back side of his house, he walks straight 50 metres, then turns to the right and walks 50 metres again. Finally, he turns towards left and stops after walking 25 metres. Now, Aditya is in which direction from the starting point ?

(*a*) South-east (*b*) North-east (*c*) South-west (*d*) North-west

ANSWERS

1. (*d*) : As shown in Fig. 1, the man initially faces in the direction OA. On moving 135° anticlockwise, he faces in the direction OB. On further moving 180° clockwise, he faces in the direction OC, which is South-west.

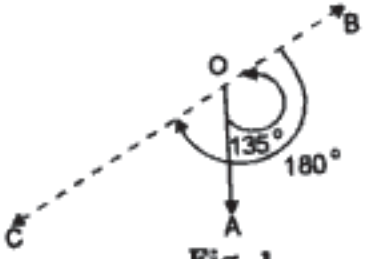


Fig. 1

2. (*b*) : As shown in Fig. 2, the man initially faces in the direction OP. On moving 90° clockwise, the man faces in the direction OQ. On further moving 135° anticlockwise, he faces in the direction OR, which is West.

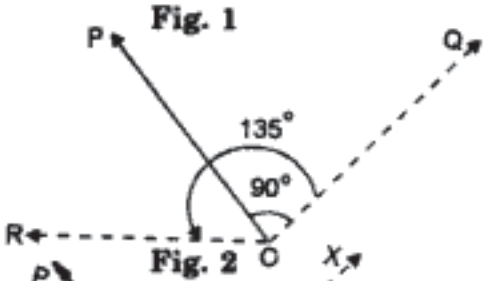


Fig. 2

3. (*d*) : As shown in Fig. 3, the man initially faces in the direction OP. On moving 90° clockwise, he faces in the direction OX. On further moving 180° anticlockwise, he faces in the direction OY. Finally, on moving 90° anticlockwise, he faces in the direction OZ, which is South-east.

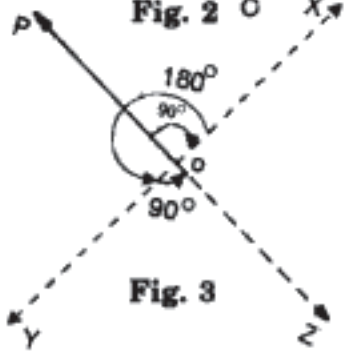


Fig. 3

4. (*b*) : As shown in Fig. 3, the man initially faces towards east *i.e.*, in the direction OA. On moving 100° clockwise, he faces in the direction OB. On further moving 145° clockwise, he faces in the direction OC. Clearly, OC makes an angle of (145° – 100°) *i.e.* 45° with OA and as such points in the direction North-east.

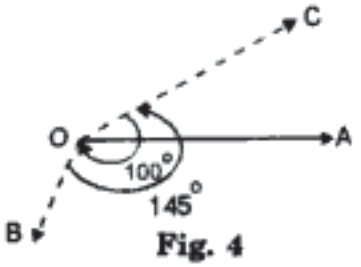


Fig. 4

5. (*e*) : The movements of Deepak are as shown in Fig. 5.

Clearly, EB = DC = 40 m.

∴ Deepak's distance from the starting point A = (AB – EB) = (75 – 40) m = 35 m.

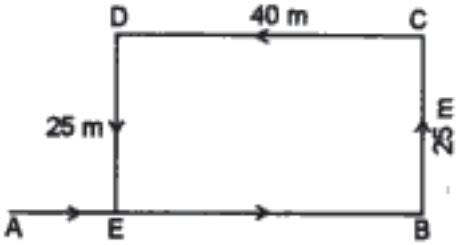


Fig. 5

6. (*b*) : The movements of Kishenkant are as shown in Fig. 6 (A to B, B to C and C to D).

AC = (AB – BC) = (10 – 6) km = 4 km.

Clearly, D is to the North-east of A.

∴ Kishenkant's distance from starting point A

$= AD = \sqrt{AC^2 + CD^2} = \sqrt{4^2 + 3^2} = \sqrt{25} = 5$ km.

So, Kishenkant is 5 km to the North-east of his starting point.

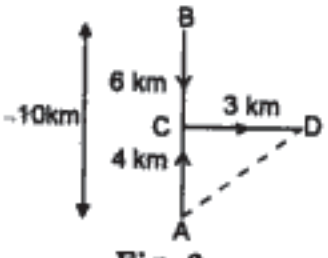


Fig. 6

7. (*b*) : The movements of the man from A to F are as shown in Fig. 7.
Clearly, DC = AB + EF.
∴ F is in line with A.
Also, AF = (BC – DE) = 5 m.
So, the man is 5 metres away from his initial position.

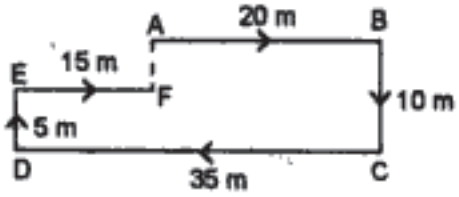


Fig. 7

8. (*d*) : The movements of Gaurav are as shown in Fig. 8.
Clearly, Gaurav's distance from his initial position P = PX = (PS + SX) = (QR + SX)
= (40 + 20) m = 60 m.

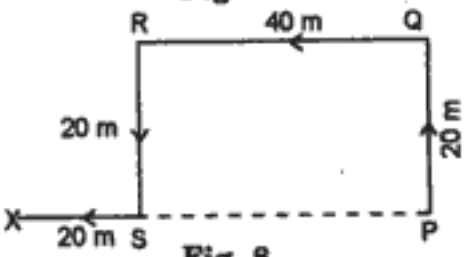


Fig. 8

9. (*c*) : The movements of Radha are as shown in Fig. 9.
Clearly, Radha's distance from the starting point O = OD = (OC – CD)
= (AB – CD) = (14 – 4) m = 10 m.

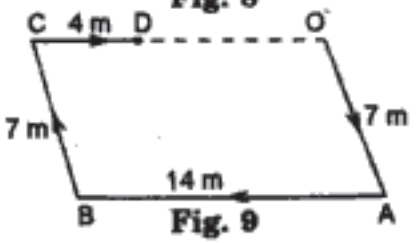


Fig. 9

10. (*a*) : The movements of Gopal are as shown in Fig. 10 from A to G.
Clearly, Gopal is finally walking in the direction FG *i.e.* North.

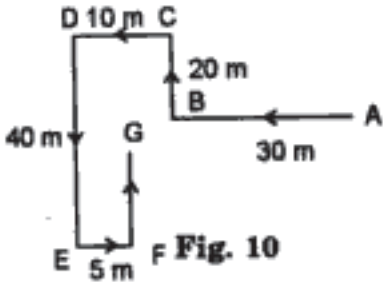


Fig. 10

11. (*c*) : The movements of the rat from A to G are as shown in Fig. 11.
Clearly, it is finally walking in the direction FG *i.e.* North.

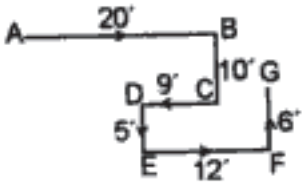


Fig. 11

12. (*a*) : The movements of the girl are as shown in Fig. 12 (A to B, B to C, C to D, D to A).
Clearly, she is finally moving in the direction DA *i.e.* North-east.

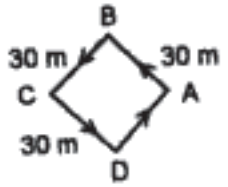


Fig. 12

13. (*b*) : The movements of Sanjeev from A to F are as shown in Fig. 13.
Clearly, Sanjeev's distance from starting point A
= AF = (AB + BF)
= AB + (BE – EF) = AB + (CD – EF)
= [10 + (20 – 10)] = (10 + 10) m = 20 m.
Also, F lies to the South of A.
So, Sanjeev is 20 metres to the south of his starting point.

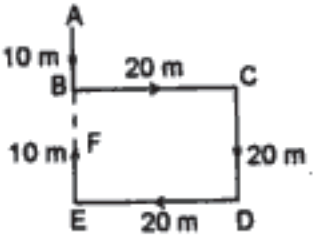


Fig. 13

14. (*b*) : The movements of Kashish are as shown in Fig. 14 (A to B, B to C, C to D, D to E).

∴ Kashish's distance from his original position A = AE = (AB – BE) = (AB – CD)

= (30 – 20) m = 10 m.

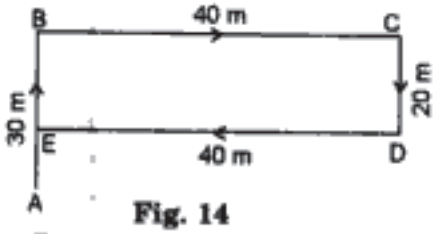


Fig. 14

15. (*d*) : The movements of the person are from A to F, as shown in Fig. 15. Clearly, the final position is F which is to the North-east of the starting point A.

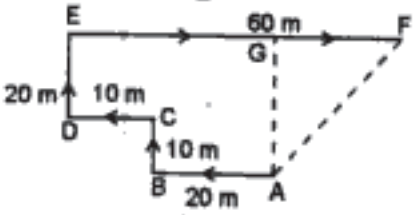


Fig. 15

16. (*e*) : The movements of the man are as shown in Fig. 16.

∴ Man's distance from initial position A

= AE = (AB + BE) = (AB + CD)

= (30 + 20) m = 50 m.

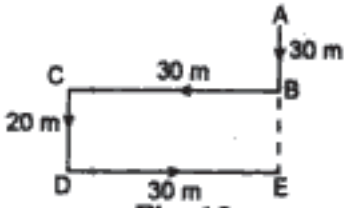


Fig. 16

17. (*a*) : The movements of Rohit are as shown in Fig. 17.

∴ Rohit's distance from starting point A

= AE = (AD + DE)

= (BC + DE) = (20 + 15) m = 35 m.

Also, E is to the East of A.

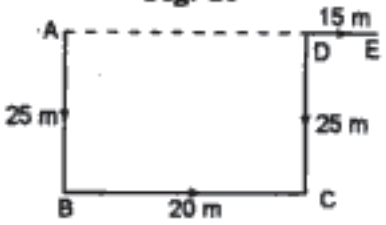


Fig. 17

18. (*c*) : The movements of Sachin are as shown in Fig. 18 (P to B, B to C, C to D and D to Q).

Clearly, distance of Q from P

= PQ = (DQ – PD) = (DQ – BC)

= (40 – 30) m = 10 m.

Also, Q is to the West of P.

∴ Q is 10 m West of P.

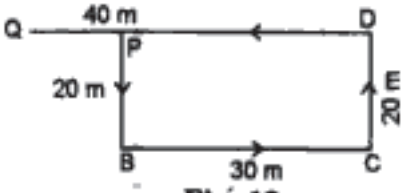


Fig. 18

19. (*d*) : The movements of Ramakant are as shown in Fig. 19.

Clearly, he is finally walking in the direction DE *i.e.*, West.

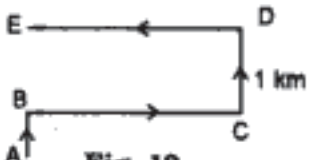


Fig. 19

20. (*c*) : The movements of the man are as shown in Fig. 20 (A to B, B to C, C to D, D to E).

Clearly, DF = BC = 5 km.

EF = (DE – DF) = (9 – 5) km = 4 km.

BF = CD = 2 km.

AF = AB + BF = AB + CD = (1 + 2) km = 3 km.

∴ Man's distance from starting point A

$= AE = \sqrt{AF^2 + EF^2} = \sqrt{3^2 + 4^2}$

$= \sqrt{25} = 5$ km.

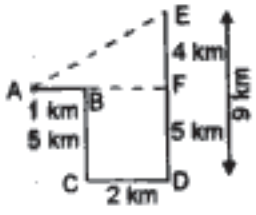


Fig. 20

21. (*a*) : The movements of Raj are as shown in Fig. 21 (X to Y, Y to A, A to B, B to C).

∴ Raj's distance from the starting point X

= XC = (XY – YC)

= (XY – BA) = (80 – 70) m = 10 m.

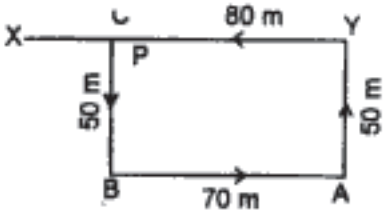


Fig. 21

22. (*b*) : The movements of Laxman are as shown in Fig. 22.

∴ Laxman's distance from his house at A

= AE = (BE – BA)

= (CD – BA) = (25 – 15) m = 10 m.

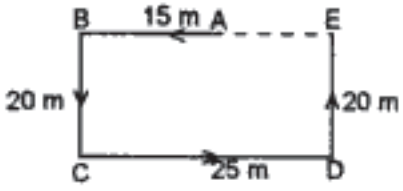


Fig. 22

23. (*c*) : The movements of Lokesh are as shown in Fig. 23 (A to B, B to C, C to D and D to E).

Clearly, his final position is E which is to the North of his house at A.

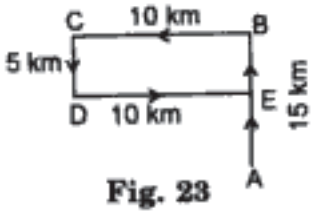


Fig. 23

24. (*a*) : The movements of Radhika are as shown in Fig. 24 (A to B, B to C, C to D and D to A).

Clearly, she is finally moving in the direction DA *i.e.* North-west.

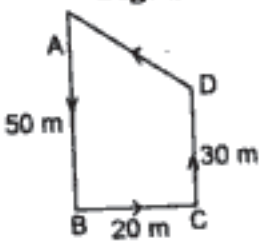


Fig. 24

25. (*a*) : The movements of A are as shown in Fig. 25 (O to P, P to Q, Q to R, R to S and S to T).

Since TS = OP + QR, so T lies in line with O.

∴ A's distance from the starting point O

= OT = (RS – PQ) = (15 – 10) m = 5 m.

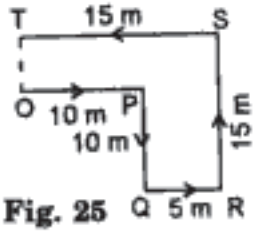


Fig. 25

26. (*d*) : The movements of Rasik from A to F are as shown in Fig. 26.

Since CD = AB + EF, so F lies in line with A.

∴ Rasik's distance from original position A

= AF = (AG + GF)

= (BC + DE) = (30 + 15) m = 45 m.

Also, F lies to the east of A.

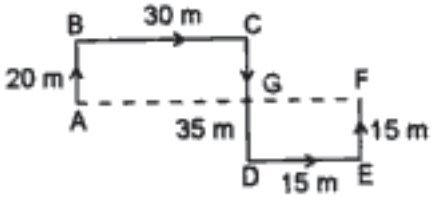


Fig. 26

27. (*b*) : The movements of the child from A to E are as shown in Fig. 27.

Clearly, the child meets his father at E.

Now, AF = (AB – FB)

= (AB – DC) = (90 – 30) m = 60 m.

EF = (DE – DF) = (DE – BC)

= (100 – 20) m = 80 m.

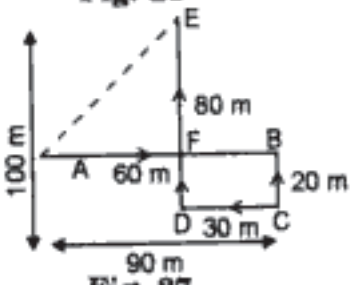


Fig. 27

$\therefore$ Required distance = AE = $\sqrt{AF^2 + EF^2} = \sqrt{(60)^2 + (80)^2}$
$= \sqrt{3600 + 6400} = \sqrt{10000} = 100$ m.

28. (*d*) : Since Aditya's house faces towards East and he walks from backside of his house, it means that he starts walking towards West. Thus, the movements of Aditya are as shown in Fig. 28 (A to B, B to C, C to D).
Clearly, Aditya's final position is D which is to the North-west of the starting point A.

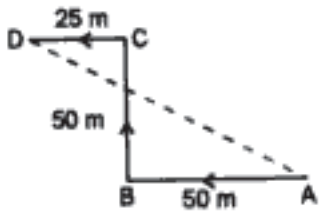


Fig. 28

EXERCISE 8B

1. Two buses start from the opposite points of a main road, 150 kms apart. The first bus runs for 25 kms and takes a right turn and then runs for 15 kms. It then turns left and runs for another 25 kms and takes the direction back to reach the main road. In the meantime, due to a minor breakdown, the other bus has run only 35 kms along the main road. What would be the distance between the two buses at this point ? **(I. Tax & Central Excise, 1996)**
(*a*) 65 kms (*b*) 75 kms (*c*) 80 kms (*d*) 85 kms

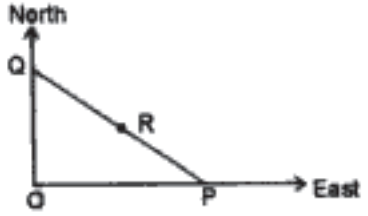
2. X and Y start moving towards each other from two places 200 m apart. After walking 60 m, B turns left and goes 20 m, then he turns right and goes 40 m. He then turns right again and comes back to the road on which he had started walking. If A and B walk with the same speed, what is the distance between them now ?
(*a*) 20 m (*b*) 30 m (*c*) 40 m (*d*) 50 m

3. If A is to the south of B and C is to the east of B, in what direction is A with respect to C ?
(*a*) North-east (*b*) North-west (*c*) South-east
(*d*) South-west (*e*) None of these

4. A is 40 m South-west of B. C is 40 m South-east of B. Then, C is in which direction of A ? **(Assistant Grade, 1997)**
(*a*) East (*b*) West (*c*) North-east (*d*) South

5. There are four towns P, Q, R and T. Q is to the South-west of P, R is to the east of Q and south-east of P, and T is to the north of R in line with QP. In which direction of P is T located ?
(*a*) South-east (*b*) North (*c*) North-east (*d*) East

6. In the given figure, P is 300 km eastward of O and Q is 400 km north of O. R is exactly in the middle of Q and P. The distance between Q and R is **(I.A.S. 1997)**



(*a*) 250 km (*b*) 250 $\sqrt{2}$ km (*c*) 300 km (*d*) 350 km

7. Ravi wants to go to the university. He starts from his home which is in the East and comes to a crossing. The road to the left ends in a theatre, straight ahead is the hospital. In which direction is the university ? **(Railways, 1998)**
(*a*) North (*b*) South (*c*) East (*d*) West

8. Of the six members of a panel sitting in a row, A is to the left of D, but on the right of E. C is on the right of X, but is on the left of B who is to the left of F. Which two members are sitting right in the middle ?
(*a*) A and C (*b*) C and B (*c*) D and B (*d*) D and C

9. A, B, C and D are playing cards. A and B are partners. D faces towards North. If A faces towards West, then who faces towards South ?
(*a*) B (*b*) C (*c*) D (*d*) Data inadequate

10. P, Q, R and S are playing a game of carrom. P, R and S, Q are partners. S is to the right of R who is facing west. Then, Q is facing **(Hotel Management, 1992)**
(*a*) North (*b*) South (*c*) East (*d*) West

11. The town of Paranda is located on Green Lake. The town of Akram is west of Paranda. Tokhada is east of Akram but west of Paranda. Kakran is east of Bopri but west of Tokhada and Akram. If they are all in the same district, which town is the farthest west ?
(*a*) Paranda (*b*) Kakran (*c*) Akram (*d*) Bopri

12. Five boys are standing in a row facing East. Deepak is to the left of Sameer, Tushar and Shailendra. Sameer, Tushar and Shailendra are to the left of Sushil. Shailendra is between Sameer and Tushar. If Tushar is fourth from the left, how far is Sameer from the right ?
(*a*) First (*b*) Second (*c*) Third (*d*) Fourth (*e*) Fifth

Directions (*Questions 13-14*) : *Study the information given below carefully and answer the questions that follow :* **(Bank P.O. 1997)**

On a playing ground, Dinesh, Kunal, Nitin, Atul and Prashant are standing as described below facing the North.

(*i*) Kunal is 40 metres to the right of Atul.
(*ii*) Dinesh is 60 metres to the south of Kunal.
(*iii*) Nitin is 25 metres to the west of Atul.
(*iv*) Prashant is 90 metres to the north of Dinesh.

13. Who is to the north-east of the person who is to the left of Kunal ?
(*a*) Dinesh (*b*) Nitin (*c*) Atul
(*d*) Either Nitin or Dinesh (*e*) None of these

14. If a boy walks from Nitin, meets Atul followed by Kunal, Dinesh and then Prashant, how many metres has he walked if he has travelled the straight distance all through ?
(*a*) 155 metres (*b*) 185 metres (*c*) 215 metres
(*d*) 245 metres (*e*) None of these

15. Two ladies and two men are playing cards and are seated at North, East, South and West of a table. No lady is facing East. Persons sitting opposite to each other are not of the same sex. One man is facing South. Which directions are the ladies facing ?
(*a*) East and West (*b*) South and East (*c*) North and East
(*d*) North and West (*e*) None of these

16. The post office is to the east of the school while my house is to the south of the school. The market is to the north of the post office. If the distance of the market from the post office is equal to the distance of my house from the school, in which direction is the market with respect to my school ?

(*a*) North (*b*) East (*c*) North-east (*d*) South-west

17. Lokesh's school bus is facing North when it reaches his school. After starting from Lokesh's house, it turns right twice and then left before reaching the school. What direction was the bus facing when it left the bus stop in front of Lokesh's house ?

(*a*) North (*b*) South (*c*) East (*d*) West (*e*) None of these

18. I start from my home and go 2 km straight. Then, I turn towards my right and go 1 km. I turn again towards my right and go 1 km again. If I am north-west from my house, then in which direction did I go in the beginning ?

(*a*) North (*b*) South (*c*) East (*d*) West (*e*) South-east

19. After walking 6 km, I turned right and covered a distance of 2 km, then turned left and covered a distance of 10 km. In the end, I was moving towards the north. From which direction did I start my journey ?

(*a*) North (*b*) South (*c*) East (*d*) West

(I. Tax & Central Excise, 1994)

20. A postman was returning to the post office which was in front of him to the north. When the post office was 100 metres away from him, he turned to the left and moved 50 metres to deliver the last letter at Shantivilla. He then moved in the same direction for 40 metres, turned to his right and moved 100 metres. How many metres was he away from the post office ?

(*a*) 0 (*b*) 90 (*c*) 150 (*d*) 100 (*e*) None of these

21. A boy rode his bicycle northwards, then turned left and rode one km and again turned left and rode 2 km. He found himself exactly one km west of his starting point. How far did he ride northwards initially ? **(Assistant Grade, 1994)**

(*a*) 1 km (*b*) 2 km (*c*) 3 km (*d*) 5 km

22. If 'South-east' is called 'East', 'North-west' is called 'West', 'South-west' is called 'South' and so on, what will 'North' be called ?

(*a*) East (*b*) North-east (*c*) North-west (*d*) South (*e*) None of these

23. If South-east becomes North, North-east becomes West and so on, what will West become ? **(Assistant Grade, 1998)**

(*a*) North-east (*b*) North-west (*c*) South-east
(*d*) South-west (*e*) South

24. A direction pole was situated on the crossing. Due to an accident the pole turned in such a manner that the pointer which was showing East, started showing South. One traveller went to the wrong direction thinking it to be West. In what direction actually he was travelling ? **(M.B.A. 1998)**

(*a*) North (*b*) South (*c*) East (*d*) West

25. A watch reads 4.30. If the minute hand points East, in what direction will the hour hand point ?

(*a*) North (*b*) North-west (*c*) South-east
(*d*) North-east (*e*) None of these

26. A clock is so placed that at 12 noon its minute hand points towards north-east. In which direction does its hour hand point at 1.30 p.m. ?
(*a*) North (*b*) South (*c*) East (*d*) West
(Hotel Management, 1995)

27. If the above clock is turned through an angle of 135° in an anticlockwise direction, in which direction will its minute hand point at 8.45 p.m. ?
(*a*) North (*b*) South (*c*) East (*d*) West

Directions (*Questions 28 to 32*) : *Read the following information carefully and answer the questions given below it :* **(Bank P.O. 1995)**

(*i*) Six flats on a floor in two rows facing North and South are allotted to P. Q, R, S, T and U.
(*ii*) Q gets a North facing flat and is not next to S.
(*iii*) S and U get diagonally opposite flats.
(*iv*) R, next to U, gets a South facing flat and T gets a North facing flat.

28. Which of the following combinations get South facing flats ?
(*a*) QTS (*b*) UPT (*c*) URP (*d*) Data inadequate (*e*) None of these

29. Whose flat is between Q and S ?
(*a*) T (*b*) U (*c*) R (*d*) P (*e*) Data inadequate

30. If the flats of T and P are interchanged, whose flat will be next to that of U ?
(*a*) P (*b*) Q (*c*) R (*d*) T (*e*) None of these

31. The flats of which of the other pairs than SU, is diagonally opposite to each other ?
(*a*) QP (*b*) QR (*c*) PT (*d*) TS (*e*) None of these

32. To arrive at the answers to the above questions, which of the following statements can be dispensed with ?
(*a*) None (*b*) (*i*) only (*c*) (*ii*) only
(*d*) (*iii*) only (*e*) None of these

33. One morning after sunrise, Gopal was standing facing a pole. The shadow of the pole fell exactly to his right. Which direction was he facing ?
(*a*) South (*b*) East (*c*) West
(*d*) Data inadequate (*e*) None of these **(Bank P.O. 1997)**

34. One morning after sunrise, Reeta and Kavita were talking to each other face to face at Tilak Square. If Kavita's shadow was exactly to the right of Reeta, which direction Kavita was facing ? **(Bank P.O. 1998)**
(*a*) North (*b*) South (*c*) East
(*d*) Data inadequate (*e*) None of these

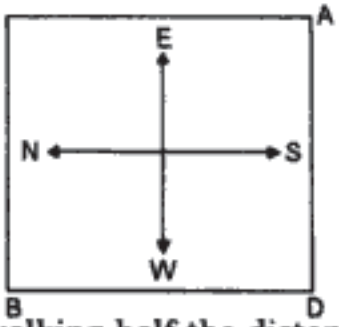
35. One morning after sunrise, Vikram and Shailesh were standing in a lawn with their backs towards each other. Vikram's shadow fell exactly towards left hand side. Which direction was Shailesh facing ?
(*a*) East (*b*) West (*c*) North (*d*) South

36. One evening before sunset two friends Sumit and Mohit were talking to each other face to face. If Mohit's shadow was exactly to his right side, which direction was Sumit facing ? **(Bank P.O. 1997)**
(*a*) North (*b*) South (*c*) West
(*d*) Data inadequate (*e*) None of these

37. Anuj started walking positioning his back towards the sun. After sometime, he turned left, then turned right and then towards the left again. In which direction is he going now ? **(I. Tax & Central Excise, 1994)**

(*a*) North or South (*b*) East or West
(*c*) North or West (*d*) South or West

Directions (*Questions 38 to 42*) : *The following questions are based on the diagram given below showing four persons stationed at the four corners of a square piece of plot as shown.*



38. A starts crossing the field diagonally. After walking half the distance, he turns right, walks some distance and turns left. Which direction is A facing now ?

(*a*) North-east (*b*) North-west (*c*) North (*d*) South-east (*e*) South-west

39. From the original position given in the above figure, A and B move one arm length clockwise and then cross over to the corner diagonally opposite; C and D move one arm length anti-clockwise and cross over the corner diagonally opposite. The original configuration ADBC has now changed to

(*a*) CBDA (*b*) BDAC (*c*) DACB (*d*) ACBD (*e*) BCAD

40. From the original position, B and D move one and a half length of sides clockwise and anticlockwise respectively. Which one of the following statements is true ?

(*a*) B and D are both at the midpoint between A and C.
(*b*) D is at the midpoint between A and C, and B at the corner originally occupied by C.
(*c*) B is at the midpoint between A and C, and D at the corner originally occupied by A.
(*d*) B and D are both at the midpoint between A and D.
(*e*) B is at the midpoint between A and C, and D at the midpoint between original position of B and C.

41. From the positions in original figure, C and A move diagonally to opposite corners and then one side each clockwise and anticlockwise respectively. B and D move two sides each clockwise and anticlockwise respectively. Where is A now ?

(*a*) At the north-west corner (*b*) At the north-east corner
(*c*) At the south-east corner (*d*) At the south-west corner
(*e*) Midway between original position of B and D

42. After the movements given in Q. 41 above, who is at the north-west corner ?

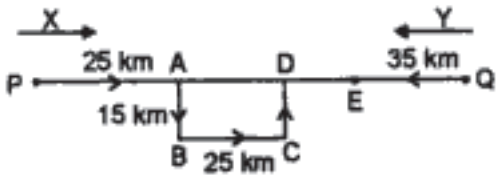
(*a*) A (*b*) B (*c*) C (*d*) D (*e*) None of these

43. A square field ABCD of side 90 m is so located that its diagonal AC is from north to south and the corner B is to the west of D. Rohan and Rahul start walking along the sides from B and C respectively in the clockwise and anti-clockwise directions with speeds of 8 km/hr and 10 km/hr. Where shall they cross each other the second time ? **(Hotel Management, 1998)**

(*a*) On AD at a distance of 30 m from A
(*b*) On BC at a distance of 10 m from B
(*c*) On AD at a distance of 30 m from D
(*d*) On BC at a distance of 10 m from C

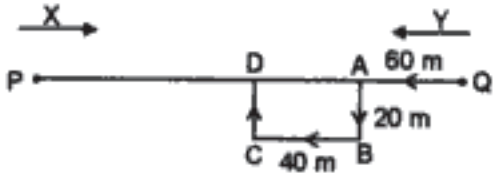
ANSWERS

1. (*a*) : Let X and Y be two buses.
Bus X travels along the path PA, AB, BC, CD.
Now, AD = BC = 25 km.
So, PD = PA + AD = 50 km.
Bus Y travels 35 km upto E.



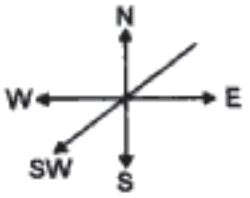
∴ Distance between two buses = PQ − (PD + QE)
= [150 − (50 + 35)] = 65 km.

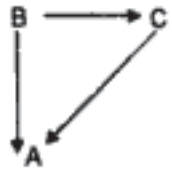
2. (*c*) : Clearly Y moves 60 m from Q upto A, then 20 m upto B, 40 m upto C and then upto D.



So, AD = BC = 40 m.
QD = (60 + 40) m = 100 m.
Since A and B travel with the same speed, A will travel the same speed along the horizontal as B travels in the same time *i.e.* (60 + 20 + 40 + 20) = 140 m.
So, X travels 140 m upto A.
∴ Distance between X and Y = AD = (100 − 60) m = 40 m.

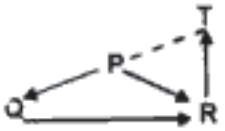
3. (*d*) : Clearly comparing the direction of A w.r.t. C in the second diagram with that in the first diagram, A will be south-west of C.





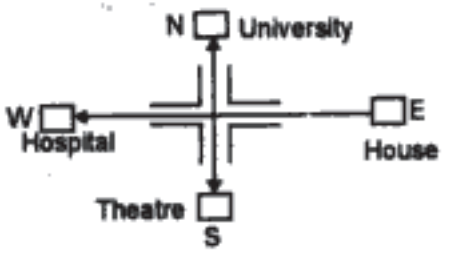
4. (*a*) : As is clear from the adjoining diagram, C lies to the east of A.

5. (*c*) : Clearly, the arrangement according to the given directions is as shown. So, T lies to the north-east of P.



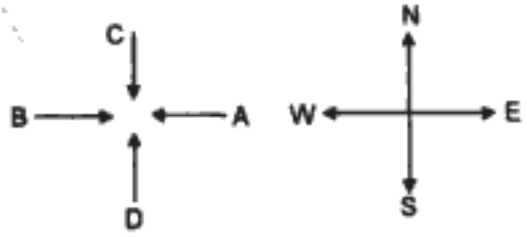
6. (*a*) : Clearly, $PQ = \sqrt{OP^2 + OQ^2} = \sqrt{(300)^2 + (400)^2}$
$= \sqrt{90000 + 160000} = 500$ km.
Since R is the midpoint of PQ, so $QR = \frac{1}{2} \times PQ$
= 250 km.

7. (*a*) : Starting from his house in the East, Ravi moves westwards. Then, the theatre, which is to the left, will be in the South. The hospital, which is straight ahead, will be to the West. So, the University will be to the North.

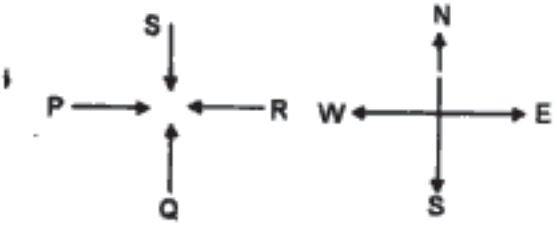


8. (*d*) : A is to the left of D means AD. A is to the right of E means EA. So, the sequence is EAD. C is to the right of X means XC. C is to the left of B means CB. B is to the left of F means BF. So, the sequence is XCBF. Thus, there are two possible arrangements — EADXCBF and XCBFEAD. In the first arrangement, the two members in the middle are D and C. In the second arrangement, the two members in the middle are B and E. So, from amongst the choices, D and C is the answer.

9. (*b*) : As per the data, D faces North. A faces towards West. So, its partner B will face towards A and hence towards East. So, C who will face D will face towards South.



10. (*a*) : As per the given data, R faces towards West. S is to the right of R. So, S is facing towards South. Thus, Q who is the partner of S, will face towards North.

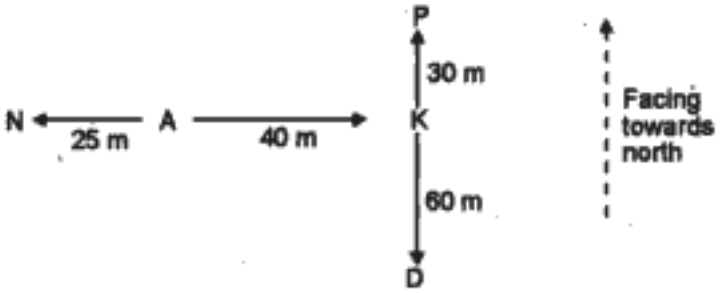


11. (*d*) : The town of Akram (A) is west of Paranda (P) means A, P. Tokhada (T) is east of Akram but west of Paranda means A, T, P. Kakran (K) is east of Bopri (B) but west of Tokhada and Akram means B, K, A, T. Combining all the arrangements, we get the sequence as B, K, A, T, P. So, farthest west is Bopri.

12. (*d*) : Deepak (D) is to the left of Sameer (S), Tushar (T) and Shailendra (Sh) means D, S, T, Sh. Sameer, Tushar and Shailendra are to the left of Sushil (Su) means S, T, Sh, Su. Shailendra is between Sameer and Tushar means S, Sh, T. Tushar is fourth from the left means □ □ □ T. Combining all the arrangements, we have D, S, Sh, T, Su. So, Sameer is fourth from the right.

Questions 13-14

Clearly, the arrangement of boys is as shown below :

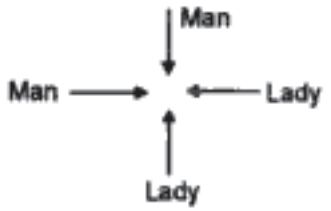


13. (*e*) : Clearly, Atul is to the left of Kunal and Prashant is to the north-east of Atul.

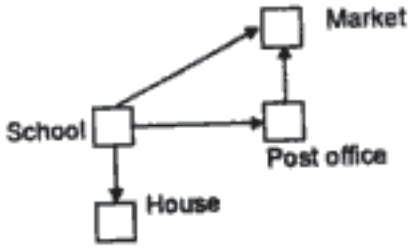
14. (*c*) : Required distance = NA + AK + KD + DP

= (25 + 40 + 60 + 90) = 215 m.

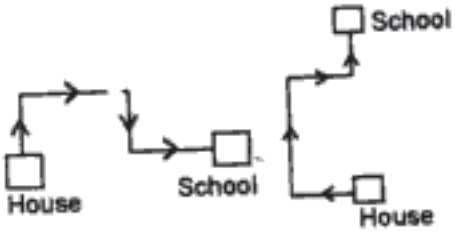
15. (*d*) : No lady is facing east means a man faces east. Persons opposite are not of same sex. So, a woman will be facing west. Again, a man faces south. So, opposite to him will be a woman facing north.



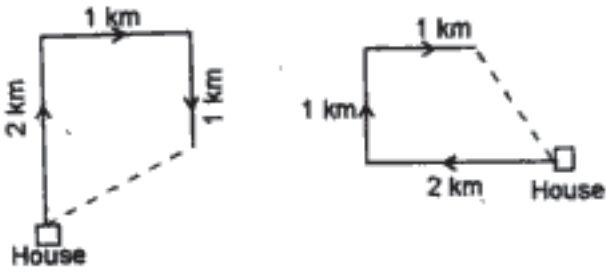
16. (*c*) : The positions of various places are as shown in the diagram.
Clearly, the market is to the north-east of school.



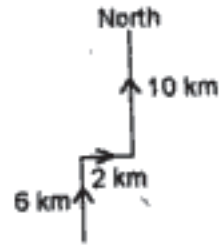
17. (*d*) : In Fig. 1, the route of the bus from Lokesh's house to the school. It is given that the bus faces North on reaching the school. Now, turning Fig. 1 90° anticlockwise, we obtain Fig. 2 which satisfies the specified conditions. It is evident from Fig. 2 that the bus faces west in front of Lokesh's house.



18. (*d*) : Clearly, the route is as shown in Fig. A. It is given that the person is finally to the north-west of his house. Rotating Fig. A 90° anticlockwise, we obtain Fig. B satisfying the specified conditions. It is evident from Fig. B that the direction of walking in the beginning was west.



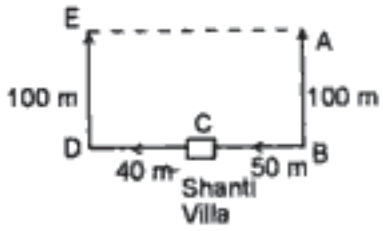
19. (*b*) : Clearly, the route is as shown in the adjoining diagram. Thus, the man started his journey from the South and moved northwards.



20. (*b*) : Clearly, the route of the postman is as shown. So, at the final point the distance of postman from post office = EA = BD

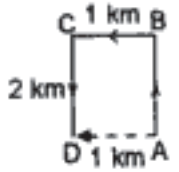
$= BC + CD$

$= (50 + 40) = 90$ m.

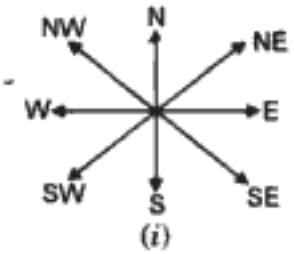


21. (*b*) : Clearly, the boy rode from A to B, then to C and finally upto D. Since D lies to the west of A, so required distance

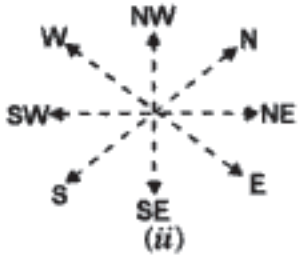
$= AB = CD = 2$ km.



22. (*c*) : In diagram (*i*) the directions are shown as they actually are. Diagram (*ii*) is as per the given data. So, comparing the direction of North in (*i*) with that in (*ii*), North will be called North-west.

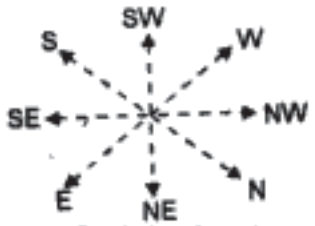


(*i*)

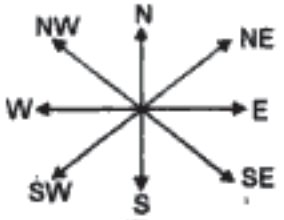


(*ii*)

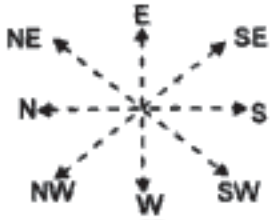
23. (*c*) : Comparing (*i*) of Q. 22 with the adjoining diagram, West will be called South-east.



24. (*b*) : The actual positions of the directions are as shown in I while the changed positions of the pointer can be described by II.



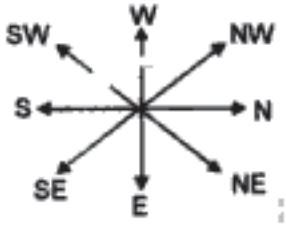
(I)



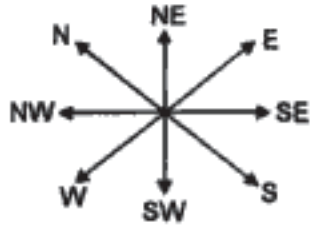
(II)

Clearly, the direction of West shown by the pointer in wrong position (Fig. II) is actually South.

25. (*d*) : Clearly, to show 4.30, the position of the minute and hour hands of the clock will be as shown. So, again as shown, if the minute hand points East, the hour hand will point in the North-east.



26. (*c*) : Clearly, the positions of the minute and hour hands at 12 noon and 1.30 p.m. are as shown in the diagram. So, as shown, the hour hand at 1.30 p.m. points towards the East.



27. (*b*) : The position of the clock on rotating the above clock 135° anticlockwise is as shown in the adjoining diagram. Clearly, the minute hand points towards the South.

Questions 28 to 32

Q gets a North-facing flat and is not next to S means

Q		S

S and U get diagonally opposite flats means

U		
Q		S

R, next to U, gets a South facing flat and T gets a north facing flat means

U	R	P
Q	T	S

So, the arrangement is :

South facing flats	U	R	P
North facing flats	Q	T	S

28. (*c*) : The South facing flats are U, R, P.

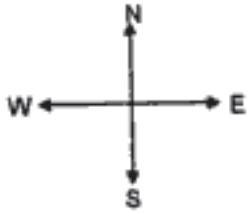
29. (*a*) : T's flat is between Q and S.

30. (*c*) : The flat next to U's flat is that of R, which remains unchanged if the flats of T and P are interchanged.

31. (*a*) : The diagonally opposite pairs are SU and QP.

32. (*a*) : Clearly, all the statements are necessary to answer the given questions.

33. (*a*) : Sun rises in the east in the morning. So, in morning, the shadow falls towards the west. Now, Gopal's shadow falls to the right. So, he is standing, facing South.



34. (*a*) : In morning, sun rises in the east and so any shadow falls towards the west. Now, Kavita's shadow falls to the right of Reeta. Hence, Reeta is facing South and Kavita is facing North.

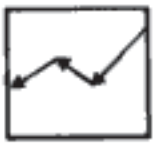
35. (*d*) : Since Vikram's shadow fell towards left, therefore, Vikram is facing North. So, Shailesh standing with his back towards Vikram, will be facing South.

36. (*b*) : In the evening, sun is in the west and so the shadows fall towards east. Now, since Mohit's shadow fell towards right, therefore, Mohit is facing North. So, Sumit standing face to face with Mohit, was facing South.

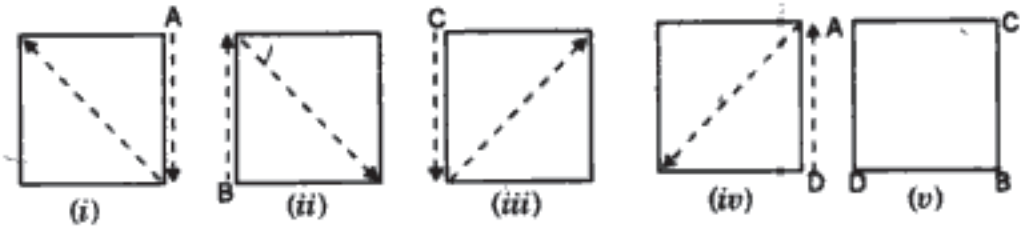
37. (*a*) : Clearly, there are two possible movements of Anuj as shown below :

Thus, Anuj is finally moving towards either North or South.

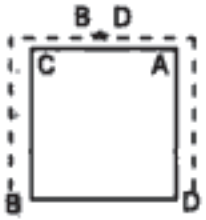
38. (*b*) : Clearly, the route of A is as shown.
Comparing it with the given diagram, the direction of A will be north-west.



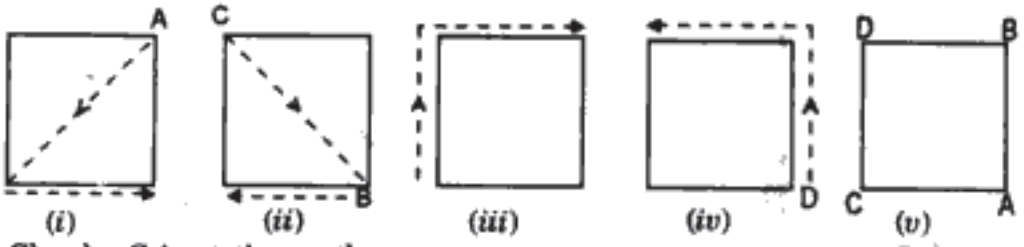
39. (*a*) : Clearly, (*i*), (*ii*), (*iii*) and (*iv*) show the movements of A, B, C and D respectively while the new arrangement so obtained is shown in (*v*). So, the configuration changes to CBDA.



40. (*a*) : The movements of B and D are clearly shown in the adjoining diagram.
So, statement (*a*) is true.

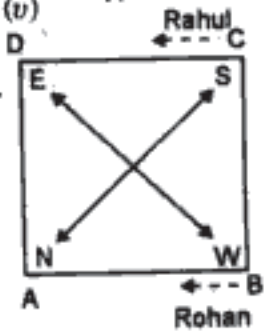


41. (*d*) : The movements of A, C, B and D are shown in figures (*i*), (*ii*), (*iii*) and (*iv*) respectively. The final configuration is shown in (*v*). Comparing (*v*) with the given diagram, A is in the south-west corner.



42. (*c*) : Clearly, C is at the north-west corner.

43. (*d*) : Clearly, the arrangement is as shown in the adjoining diagram.



Rohan's speed $= 8$ km/hr

$$= \frac{8000}{60 \times 60} \text{ m/sec} = \frac{20}{9} \text{ m/sec.}$$

Rahul's speed $= 10$ km/hr

$$= \frac{10000}{60 \times 60} \text{ m/sec} = \frac{25}{9} \text{ m/sec.}$$

Since Rohan and Rahul are moving in opposite directions, so they together cover a distance of $\left(\frac{20}{9} + \frac{25}{9}\right)$ *i.e.*, $\frac{45}{9}$ or 5 metres in one second.

To meet at a point, they together have to cover distance (CD + DA + AB) *i.e.* 270 m.

Now, 5 metres is covered in 1 second.

So, 270 m will be covered in $\left(\frac{1}{5} \times 270\right) = 54$ seconds.

Now, distance covered by Rohan in 54 seconds $= \left(\frac{20}{9} \times 54\right)$ m $= 120$ m.

Distance covered by Rahul in 54 seconds $= \left(\frac{25}{9} \times 54\right)$ m $= 150$ m.

Thus, Rohan and Rahul meet for the first time on AD at a point 30 m from A and 60 m from D. Now, to meet again, Rohan and Rahul will have to complete one full round *i.e.* together move a distance of 360 m.

5 metres is covered by both together in 1 second.

Thus, 360 m will be covered by both in $\left(\frac{1}{5} \times 360\right) = 72$ seconds.

Now, distance covered by Rohan in 72 seconds $= \left(\frac{20}{9} \times 72\right)$ m $= 160$ m.

Distance covered by Rahul in 72 seconds $= \left(\frac{25}{9} \times 72\right)$ m $= 200$ m.

Thus, Rohan and Rahul meet on BC at a point 10 m from C and 80 m from B.

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9. LOGICAL VENN DIAGRAMS

This section deals with questions which aim at analysing a candidate's ability to relate a certain given group of items and illustrate it diagrammatically.

Here are a few different types of Venn diagrams with their implications made clear.

Suppose you are given a group of three items. Then,

1. if the items evidently belong to three different groups, the Venn diagram representing it would be as shown alongside.

   Ex. Doctors, Engineers, Lawyers

   These three items bear no relationship to each other. So, they are represented by 3 disjoint figures as shown in Fig. 1.

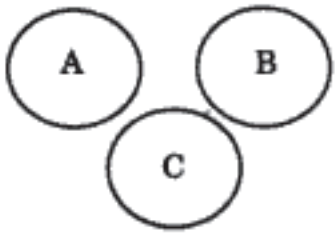


Fig. 1

2. if one item belongs to the class of the second and the second belongs to the class of third, then the representation is in the form of three concentric circles, as shown in Fig. 2.

   Ex. Seconds, Minutes, Hours

   Clearly, seconds are a part of minutes and minutes are a part of hours. So, the Venn diagram would be as shown in the adjoining figure with circle A representing *Seconds*, circle B representing *Minutes* and circle C representing *Hours*.

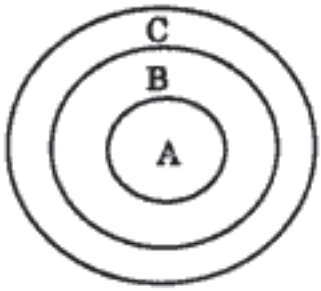


Fig. 2

3. if two separate items belong to the class of the third, they are represented by two disjoint circles inside a bigger circle as shown in Fig. 3.

   Ex. Table, Chair, Furniture

   Clearly, table and chair are separate items but both are items of furniture. So, they would be represented as in the adjoining figure with circle A representing *Table*, circle B representing *Chair* and circle C representing *Furniture*.

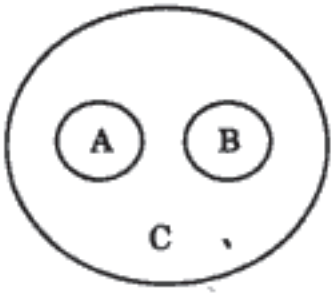


Fig. 3

4. if two items belong to the class of the third such that some items of each of these two groups are common in relationship, then they are represented by two intersecting circles enclosed within a bigger circle.

   Ex. Males, Fathers, Brothers

   Clearly, some fathers may be brothers. So, fathers and brothers would be represented by two intersecting circles. Also both fathers and brothers are males. So, the diagrammatic representation would be as shown in Fig. 4, with circle A representing *Fathers*, circle B representing *Brothers* and circle C representing *Males*.

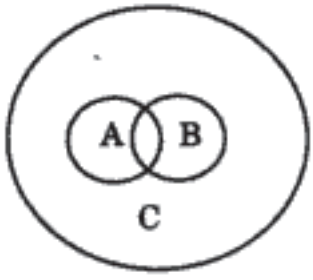


Fig. 4

5. if two items are partly related to the third, and are themselves independent of each other they are represented by three intersecting circles in a line.

Ex. Dogs, Pets, Cats

Clearly, some dogs and some cats are pets. But, all the pets are not dogs or cats. Also, dogs and cats are not related to each other. So, the given items would be represented as shown in Fig. 5 with circle A representing *Dogs*, circle B representing *Pets* and circle C representing *Cats*.

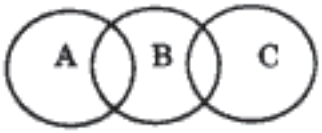


Fig. 5

6. if the three items are partly related to each other, they are represented as shown in the adjoining figure.

Ex. Clerks, Government Employees, Educated Persons

Clearly, some clerks may be government employees and some may be educated. Similarly, some government employees may be clerks and some may be educated. Also, some educated persons may be clerks and some may be government employees. So, the given items may be represented as shown in Fig. 6 with three different circles denoting the three classes.

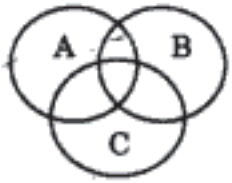


Fig. 6

7. if one item belongs to the class of second while third item is entirely different from the two, then they may be represented by the adjoining diagram.

Ex. Engineers, Human Beings, Rats

Clearly, all engineers are human beings. This would be represented by two concentric circles. But the class of rats is entirely different from these two. Thus, these items would be represented as shown in Fig. 7 with circle A representing *Engineers*, circle B representing *Human Beings* and circle C representing *Rats*.

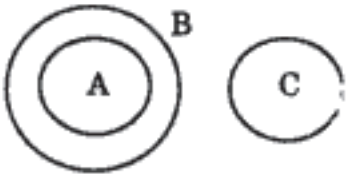


Fig. 7

8. if one item belongs to the class of second and the third item is partly related to these two, they are represented as shown alongside.

Ex. Females, Mothers, Doctors

Clearly, all mothers are females. This would be represented by two concentric circles. But, some females and some mothers can be doctors. So, the circle representing doctors would intersect the two concentric circles. Thus, the diagram becomes as shown in Fig. 8 with circle A representing *Mothers*, circle B representing *Females* and circle C representing *Doctors*.

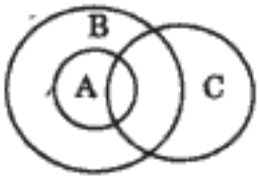


Fig. 8

9. if one item belongs to the class of second and the third item is partly related to the second, they are represented as shown alongside.

Ex. Grass-eating Animals, Cows, Flesh-eating Animals

Clearly, cows are grass-eating animals. So, they would be represented by two concentric circles. But some grass-eating animals are flesh-eating also. Thus, the Venn diagram is as shown in Fig. 9 with circle A representing *Cows*, circle B representing *Grass-eating Animals* and circle C representing *Flesh-eating Animals*.

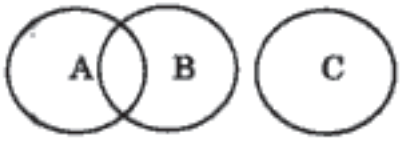


Fig. 9

EXERCISE 9A

1. Which of the following diagrams correctly represents *Elephants, Wolves, Animals* ? **(I.A.S. 1992)**

(*a*) (*b*) (*c*) (*d*)

2. Which one of the following Venn diagrams correctly illustrates the relationship among the classes : *Carrot, Food, Vegetable* ? **(I.A.S. 1996)**

(*a*) (*b*) (*c*) (*d*)

Directions (*Questions 3 to 7*) : *In the following questions, three classes are given. Out of the four figures that follow, you are to indicate which figure will best represent the relationship amongst the three classes.*

(*a*) (*b*) (*c*) (*d*)

3. Women, Mothers, Widows

4. Authors, Teachers, Men

5. Sparrows, Birds, Mice

6. Tea, Coffee, Beverages

7. Boys, Students, Athletes

8. Select from the given diagrams, the one that illustrates the relationship among the given three classes : *Judge, Thief, Criminal.* **(S.C.R.A. 1994)**

(*a*) (*b*) (*c*) (*d*)

9. Choose from the four diagrams given below, the one that illustrates the relationship among *Languages, French, German.*

(*a*) (*b*) (*c*) (*d*)

10. Which one of the following diagrams correctly represents the relationship among the classes : *Tennis fans, Cricket players, Students* ? **(I.A.S. 1990)**

(*a*) (*b*) (*c*) (*d*)

11. Which one of the following Venn diagrams best illustrates the three classes : *Rhombus, Quadrilaterals, Polygons* ?

(*a*) (*b*) (*c*) (*d*)

Directions (*Questions 12 to 15*) : *Each of these questions below contains three groups of things. You are to choose from the following five numbered diagrams, the diagram that depicts the correct relationship among the three groups of things in each question.* **(S.B.I.P.O. 1995)**

(*a*) (*b*) (*c*) (*d*) (*e*)

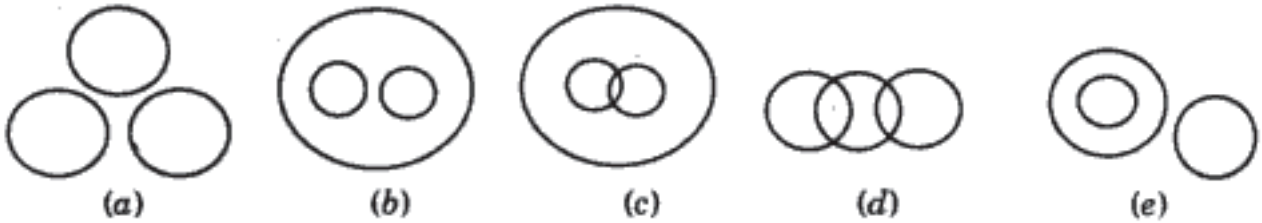
12. Tables, Chairs, Furniture

13. Tie, Shirt, Pantaloon

14. Dogs, Pets, Cats

15. Brinjal, Meat, Vegetables

Directions (*Questions 16 to 28*) : *Each one of the following questions contains three items. Using the relationship between these items, match each question with the most suitable diagram. Your answer is the letter denoting that diagram.*



(*a*) (*b*) (*c*) (*d*) (*e*)

16. Deer, Rabbit, Mammal

17. Human beings, Teachers, Graduates **(Central Excise, 1995)**

18. Whales, Fishes, Crocodiles

19. Plums, Tomatoes, Fruits

20. Mountains, Forests, Earth

21. Tiger, Fox, Carnivores

22. Grams, Beans, Legumes

23. Flowers, Clothes, White

24. Uncles, Parents, Friends

25. Rohtak, Haryana, Punjab

26. Engineer, Doctor, People

27. Thieves, Lawyers, Criminals

28. Sea, Island, Mountain

29. Which is the most suitable Venn diagram among the following, which represents interrelationship among **Antisocial elements, Pick pockets and Black mailers ?**

(M.B.A. 1997)

(*a*) (*b*) (*c*) (*d*)

30. Which one of the following four logical diagrams represents correctly the relationship between : *Musicians, Instrumentalists, Violinists* ? **(I.A.S. 1994)**

(*a*) (*b*) (*c*) (*d*)

31. Select from the four alternative diagrams, the one that best illustrates the relationship among the three classes : *Pigeons, Birds, Dogs.* **(Assistant Grade, 1993)**

(*a*) (*b*) (*c*) (*d*)

Directions (*Questions 32 to 37*) : *In each of the following questions, choose the Venn diagram which best illustrates the relationship among three given items ?*

(*a*) (*b*) (*c*) (*d*) (*e*)

32. Diseases, Leprosy, Scurvy **(Hotel Management, 1991)**

33. Hockey, Cricket, Games

34. Yak, Zebra, Bear **(Hotel Management, 1991)**

35. Sun, Moon, Stars

36. Animals, Men, Plants

37. Mercury, Mars, Planets **(Hotel Management, 1991)**

38. Which of the following figures correctly represents the relation between : *Doctors, Lawyers, Professionals* ?

(*a*) (*b*) (*c*) (*d*)

39. Which one of the following sets is best represented in the adjoining diagram ? **(S.C.R.A. 1994)**

(*a*) Animals, Insects, Cockroaches

(*b*) Country, States, Districts

(*c*) Animals, Males, Females and Hermaphrodites

(*d*) States, Districts, Union Territory

40. Which of the following gives the proper relation of *Tall men, Black haired people, Indians* ?

(*a*) (*b*) (*c*) (*d*)

41. If animals that live on land and the animals that live in water are represented by two big circles and animals that live in water and on land are represented by small circle, the combination of these three can be best represented as

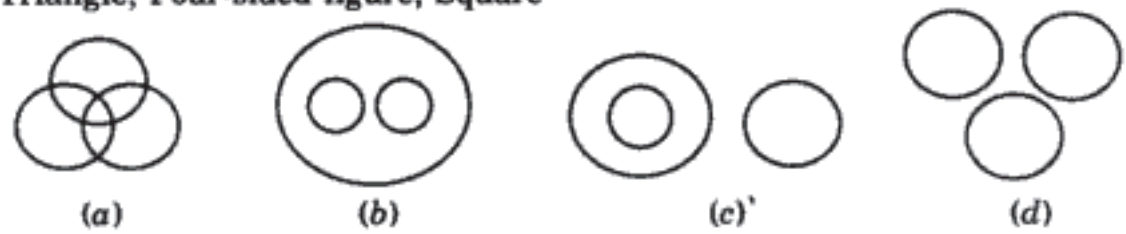
(*a*) (*b*) (*c*) (*d*)

Directions (*Questions 42 to 44*) : *In each of the following questions, find out which of the alternatives* (*a*), (*b*) (*c*) *or* (*d*) *indicates the correct relationship between the three given words* ? **(I. Tax & Central Excise, 1995)**

42. Elected house, M.P., M.L.A.

(*a*) (*b*) (*c*) (*d*)

43. Triangle, Four-sided figure, Square



(*a*) (*b*) (*c*)' (*d*)

44. Doctor, Nurse, Human being

(*a*) (*b*) (*c*) (*d*)

Questions 45 to 53 :

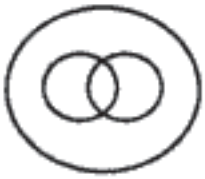
(*a*)

Indicates that one class is completely contained in the other but not the third.

(*b*)

Indicates that two classes are completely contained in the third.

(*c*)



Indicates that neither class is completely contained in the other but the two have common members, forming one entity.

(*d*)

Indicates that two classes are interrelated and third one is not.

Directions : *Choose the Venn diagram which best illustrates the three given classes in each question.*

45. Protons, Electrons, Atoms

46. Sun, Planets, Earth **(Railways, 1990)**

47. Dog, Animal, Pet

48. Science, Physics, Chemistry

49. Atmosphere, Hydrogen, Oxygen **(Railways, 1990)**

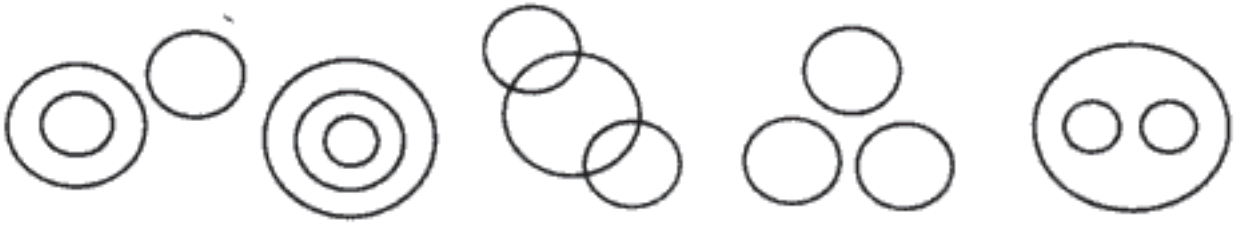
50. Wheat, Grains, Maize

51. Machine, Lathe, Mathematics **(C.B.I., 1990)**

52. Biology, Botany, Zoology **(Railways, 1990)**

53. Citizens, Educated, Men

Directions (*Questions 54 to 58*) : *Each of the questions below contains three elements. These elements may or may not have some inter se linkage. Each group of the elements may fit into one of the diagrams at* (*a*), (*b*), (*c*), (*d*) *and* (*e*). *You have to indicate the group of elements which correctly fits into the diagrams.* **(S.B.I.P.O. 1997)**



(*a*) (*b*) (*c*) (*d*) (*e*)

54. Pencil, Stationery, Jeep

55. Factory, Machinery, Product

56. Vegetable, Brinjal, Cauliflower

57. Honesty, Intelligence, Aptitude

58. Truck, Ship, Goods

Directions (*Questions 59 to 68*) : *Of the four alternatives in each of the following questions, three alternatives are such that the three words in each are related among themselves in one of the five ways represented by* (*a*), (*b*), (*c*), (*d*) *and* (*e*) *below while none of these relationships is applicable to the remaining alternative. That is your answer.* **(L.I.C.A.A.O. 1988)**

(*a*) (*b*) (*c*) (*d*) (*e*)

59. (*a*) Army, General, Colonel
(*b*) Boy, Student, Player
(*c*) Painter, Scholar, Table
(*d*) Man, Typist, Peon

60. (*a*) Hen, Dog, Cat
(*b*) Body, Ear, Mouth
(*c*) Bed, Ward, Nurse
(*d*) Tiger, Animal, Carnivorous

61. (*a*) Atmosphere, Air, Oxygen
(*b*) Boy, Girl, Student
(*c*) Man, Worker, Garden
(*d*) Animal, Dog, Cat

62. (*a*) Animal, Mammal, Cow
(*b*) Colour, Cloth, Merchant
(*c*) Colour, Red, Blue
(*d*) Male, Horse, Mare

63. (*a*) Body, Hand, Finger
(*b*) Mammal, Nurse, Woman
(*c*) Cereal, Wheat, Rice
(*d*) Males, Cousins, Nephews

64. (*a*) Bed, Ward, Hospital
(*b*) Boy, Girl, Player
(*c*) Copper, Zinc, Iron
(*d*) Book, Page, Paragraph

65. (*a*) Star, Moon, Mars
(*b*) Professor, Scholar, Politician
(*c*) Nurse, Doctor, Woman
(*d*) Swimmer, Carpenter, Singer

66. (*a*) Periodical, Weekly, Book
(*b*) Mineral, Copper, Wood
(*c*) Doctors, Human beings, Married people
(*d*) Army, Doctor, Engineer

67. (*a*) Director, Engineer, Musician
(*b*) Apple, Orange, Mango
(*c*) Fruit, Mango, Grass
(*d*) Oxygen, Air, Water

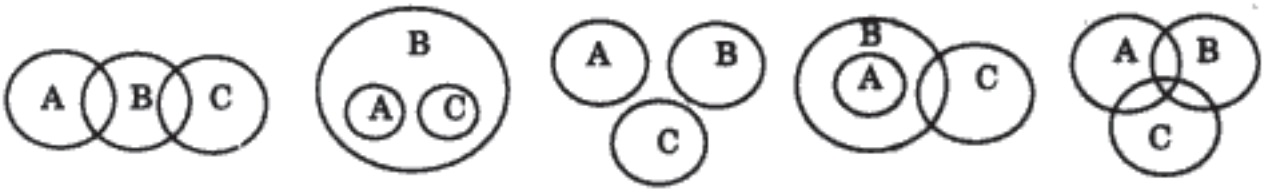
68. (*a*) Mineral, Iron, Copper
(*b*) Dean, Painter, Singer
(*c*) Seed, Leaf, Root
(*d*) Piston, Engine, Wheel

Directions (*Questions 69 to 74*) : *In each of the following questions, there are three words which are related in some way. The relationship in each case is indicated by one of the four alternatives* (*a*), (*b*), (*c*) *and* (*d*) *given below. The alternative which best states the relationship is your answer.* **(C.A.T. 1997)**

(*a*) P includes part of Q and part of R but Q and R are independent of each other.
(*b*) P includes Q and part of R but Q is independent of R.
(*c*) P, Q and R include parts of one another.
(*d*) P includes both Q and R.

69. Wheat, Loaf, Barley
70. Singer, Writer, Actor
71. Soldier, Army, Engineer
72. Wood, Steel, Furniture
73. Researcher, Historian, Scholar
74. Tiger, Elephant, Quadruped

Directions (*Questions 75 to 78*) : *Given below are five patterns represented by circles A, B and C which indicate the logical relationship between and among the respective descriptions. On the basis of description given for A, B and C respectively in the questions, decide which of the given patterns* (*a*), (*b*), (*c*), (*d*) *or* (*e*) *best indicates the logical relationship.*



(*a*) (*b*) (*c*) (*d*) (*e*)

75. (A) Doctor (B) Male (C) Actor
76. (A) Rose (B) Flower (C) Lotus
77. (A) Father (B) Mother (C) Child
78. (A) Gold (B) Ornament (C) Silver

Directions (*Questions 79 to 83*) : *Choose the Venn diagram which best illustrates the three given classes in each question :* **(Hotel Management, 1997)**

(*a*) (*b*) (*c*) (*d*)

79. Girl, Athlete, Singer
80. Window, Room, Wall
81. State, Country, City
82. Copper, Paper, Wire
83. Teacher, Graduate, Player

Directions (*Questions 84-85*) : *Choose the Venn diagram which best illustrates the three given classes in each of the following questions :*

(M.B.A. 1998)

(*a*) (*b*) (*c*) (*d*) (*e*)

84. Vertebrates, Non-vertebrates, Living beings
85. Women, Teachers, Doctors
86. In a dinner party both fish and meat were served. Some took only fish and some only meat. There were some vegetarians who did not accept either. The rest accepted both fish and meat. Which of the following logic diagrams correctly reflects this situation ? **(I.A.S. 1998)**

(*a*) (*b*) (*c*) (*d*)

ANSWERS

1. (*a*) : *Elephants and Wolves* bear no relationship to each other. But, both of them are *animals*. (Fig. 1)

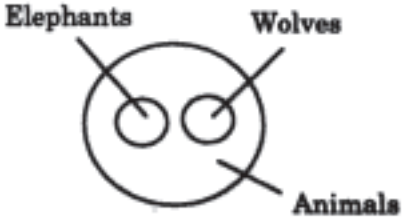


Fig. 1

2. (*a*) : All *carrots* are *vegetables*. All *vegetables* are *foods*. (Fig. 2)

Fig. 2

3. (*d*) : All *mothers* are *women*. Some *mothers* and some *women* can be widows. (Fig. 3)

Fig. 3

4. (*a*) : Some *authors* can be *teachers*. Some *teachers* can be *men*. Some *authors* can be *men*. So, the given items are partly related to each other. (Fig. 4)

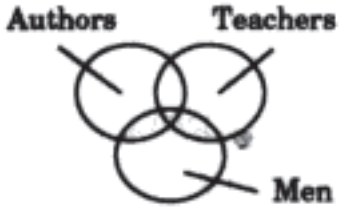


Fig. 4

5. (*b*) : All *sparrows* are *birds*. But, *mice* is entirely different. (Fig. 5)

Fig. 5

6. (*c*) : *Tea* and *Coffee* are two separate unrelated items. But, both of them are *beverages*. (Fig. 6)

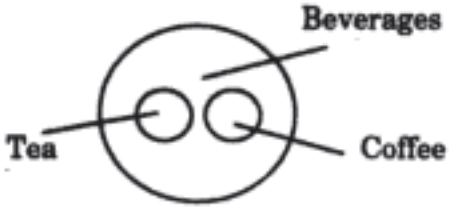


Fig. 6

7. (*a*) : Some *boys* are *students*. Some *students* are *athletes*. Some *boys* are *athletes*. So, the given items are partly related to each other. (Fig. 7)

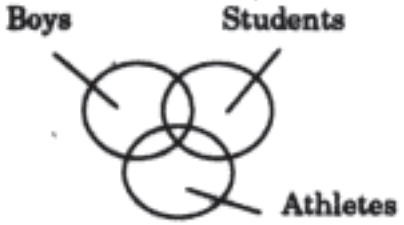


Fig. 7

8. (*c*) : All *thieves* are *criminals*. But *judge* is entirely different. (Fig. 8)

Fig. 8

9. (*c*) : Both *French* and *German* are *languages*. But, both of them are different from each other. (Fig. 9)

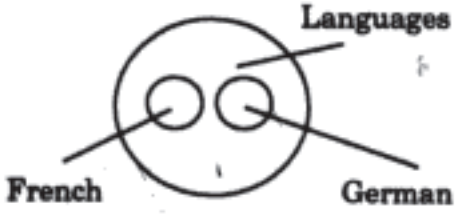


Fig. 9

10. (*a*) : Some *students* can be *cricket players*. Some *cricket players* can be *tennis fans*.
Some *students* can be *tennis fans*. So, the given items are partly related to each other.
(Fig. 10).

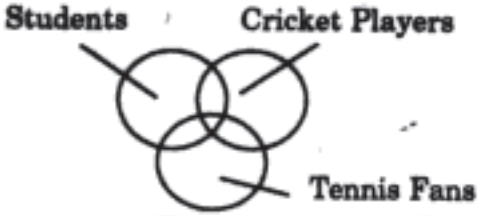


Fig. 10

11. (*a*) : All *rhombus* are *quadrilaterals*. All *quadrilaterals* are *polygons*. (Fig. 11)

Fig. 11

12. (*d*) : *Tables* and *Chairs* are unrelated items. But, both are items of *Furniture*. (Fig. 12)

Fig. 12

13. (*c*) : *Tie, Shirt* and *Pantaloon* are separate items, entirely different from each other. (Fig. 13)

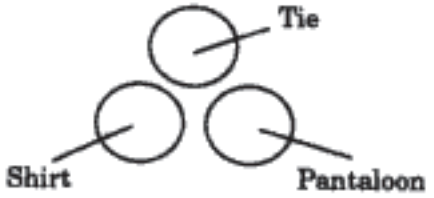


Fig. 13

14. (*d*) : *Dogs* and *Cats* are entirely different from each other. But, both are *pet* animals. (Fig. 14)

Fig. 14

15. (*e*) : *Brinjal* is a *vegetable*. But *Meat* is entirely different. (Fig. 15)

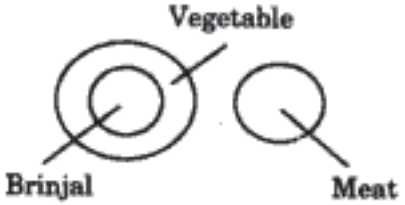


Fig. 15

16. (*b*) : *Deer* and *Rabbit* are unrelated items. But, both are *mammals*. (Fig. 16)

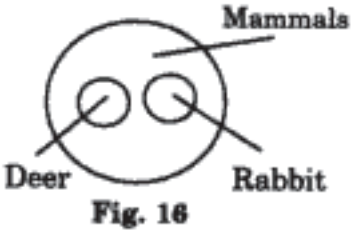


Fig. 16

17. (*c*) : All *teachers* and *graduates* are *human beings*. But, some *teachers* can be *graduates* and some *graduates* can be *teachers*. (Fig. 17)

Fig. 17

18. (*a*) : *Whales, Fishes* and *Crocodiles* are all separate items, entirely different from each other.
So, they would be represented by three disjoint circles. (Fig. 18)

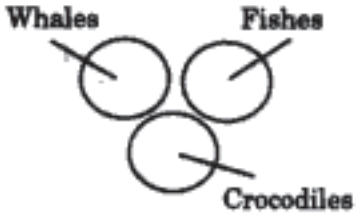


Fig. 18

19. (*e*) : All *plums* are *fruits*. But, *tomatoes* are entirely different. (Fig. 19)

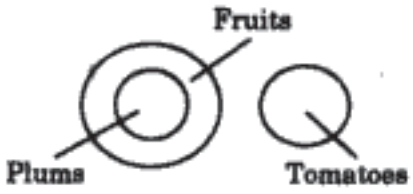


Fig. 19

20. (*c*) : *Mountains* and *Forests* are parts of *earth*. But, some *mountains* are *forested* and some *forests* are *mountainous*. (Fig. 20)

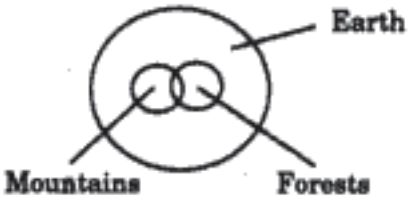


Fig. 20

21. (*b*) : *Tiger* and *Fox* are unrelated and entirely different. But, both are *carnivores* or flesh-eating animals. (Fig. 21)

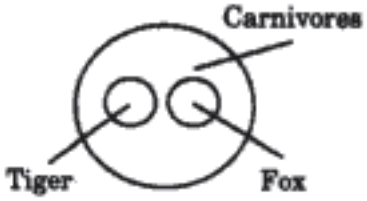


Fig. 21

22. (*b*) : *Grams* and *Beans* are entirely different from each other. But, both are *legumes*. (Fig. 22)

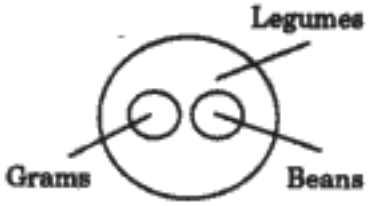


Fig. 22

23. (*d*) : Some *flowers* are *white*. Some *clothes* are *white*. But, all *white* things are not *flowers* or *clothes*. (Fig. 23)

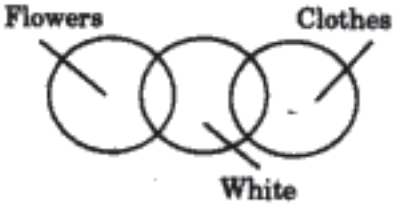


Fig. 23

24. (*a*) : *Uncles, Parents* and *Friends* are entirely different from each other. (Fig. 24)

Fig. 24

25. (*e*) : *Rohtak* is a part of *Haryana*. *Punjab* is a separate state. (Fig. 25)

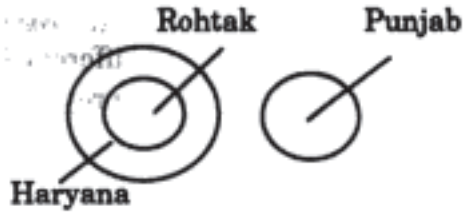


Fig. 25

26. (*b*) : Both *Engineer* and *Doctor* are *people*. But, both of them are different from each other. (Fig. 26)

Fig. 26

27. (*e*) : All *thieves* are *criminals*. But, *lawyers* are entirely different. (Fig. 27)

Fig. 27

28. (*e*) : *Island* is a part of *Sea*. But, *Mountain* is entirely different. (Fig. 28)

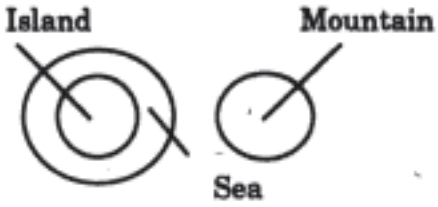


Fig. 28

29. (*c*) : Both *pickpockets* and *blackmailers* are *anti-social elements*. But, some *pickpockets* can be *blackmailers* and vice-versa. (Fig. 29)

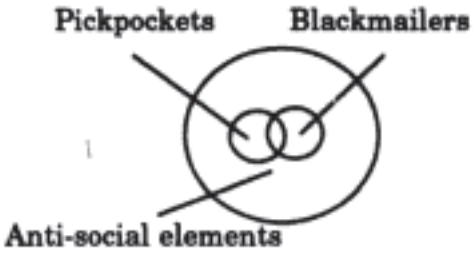


Fig. 29

30. (*a*) : All *violinists* are *instrumentalists*. All *instrumentalists* are *musicians*. (Fig. 30)

Fig. 30

31. (*a*) : All *pigeons* are *birds*. But, *dogs* are entirely different. (Fig. 31)

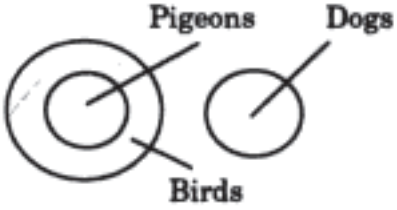


Fig. 31

32. (*a*) : Both *Leprosy* and *Scurvy* are *Diseases*. But, both are entirely different from each other. (Fig. 32)

Fig. 32

33. (*a*) : Both *Hockey* and *Cricket* are *Games*. But, both are entirely different from each other. (Fig. 33)

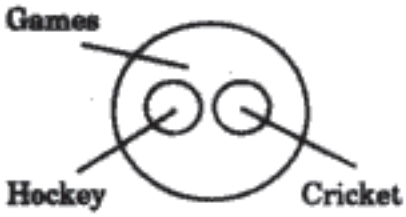


Fig. 33

34. (*b*) : *Yak*, *Zebra* and *Bear* are all different from each other. (Fig. 34)

Fig. 34

35. (*c*) : *Sun* is a *star*. *Moon* is entirely different from the two. (Fig. 35)

Fig. 35

36. (*c*) : *Men* belong to the class of *animals*. *Plants* are entirely different from the two. (Fig. 36)

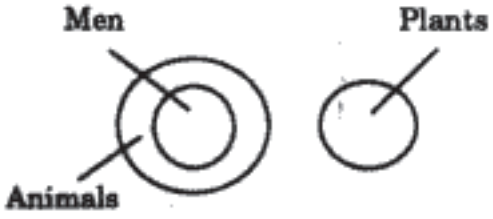


Fig. 36

37. (*a*) : *Mercury* and *Mars* are entirely different from each other. But, both are *planets*. (Fig. 37)

Fig. 37

38. (*c*) : Both *Doctors* and *Lawyers* are *Professionals*. But, both are entirely different from each other. (Fig. 38)

Fig. 38

39. (*d*) : *Districts* form part of the *State*. But, *Union Territory* is entirely different. (Fig. 39)

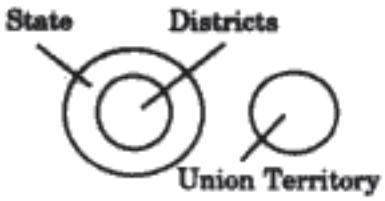


Fig. 39

40. (*d*) : Some *tall men* can be *black haired*. Some *black haired* persons can be *Indians*.
Some *tall men* can be *Indians*.
So, all the three items are partly interrelated. (Fig. 40)

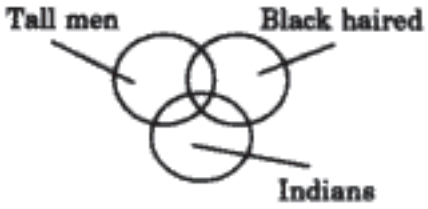


Fig. 40

41. (*b*) : Clearly, each one of the animals that live in water and on land, lies in both the other two categories. Also, some of the animals that live on land also live in water.

42. (*b*) : Clearly, no M.P. can be M.L.A. Also, all M.P.s and M.L.A.s belong to the elected house.

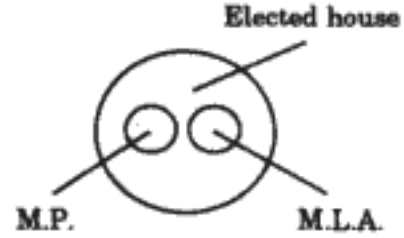


Fig. 41

43. (*c*) : *Square* is a *four-sided figure*. But, *triangle* is entirely different. (Fig. 42)

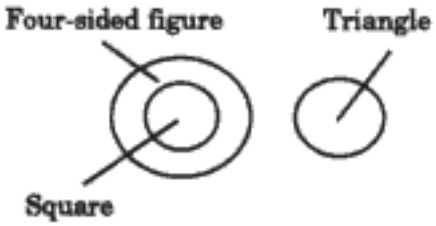


Fig. 42

44. (*a*) : *Doctor* and *Nurse* are entirely different. But, both are *human beings*. (Fig. 43)

Fig. 43

45. (*b*) : *Protons* and *Electrons* are entirely different from each other. But, both are parts of *atoms*. (Fig. 44)

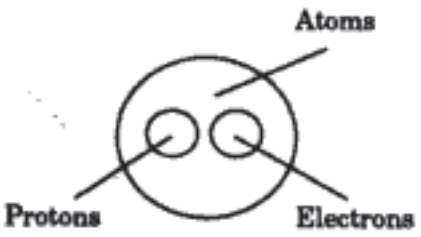


Fig. 44

46. (*a*) : *Earth* belongs to the class of *Planets*. But, *Sun* is entirely different from the two. (Fig. 45)

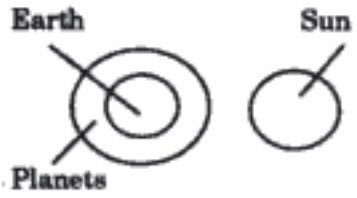


Fig. 45

47. (*c*) : Some *dogs* are *pets* and some *pets* are *dogs*. Both, *dog* and *pets* are *animals*. (Fig. 46)

Fig. 46

48. (*b*) : *Physics* and *Chemistry* are entirely different from each other. But, both belong to the class of *Science*. (Fig. 47)

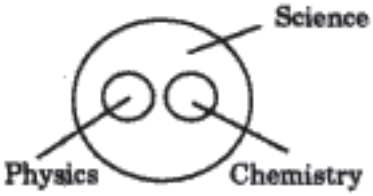


Fig. 47

49. (*b*) : *Hydrogen* and *Oxygen* are entirely different from each other.
But, both are parts of *atmosphere*. (Fig. 48)

Fig. 48

50. (*b*) : *Wheat* and *Maize* are two different items. But, both belong to the class of *Grains*. (Fig. 49)

Fig. 49

51. (*a*) : *Lathe* is a type of *machine*. But, *Mathematics* is entirely different from the two. (Fig. 50)

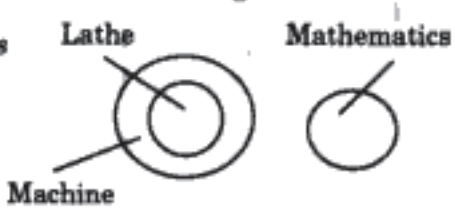


Fig. 50

52. (*b*) : *Botany* and *Zoology* are entirely different from each other. But, both are branches of *Biology*. (Fig. 51)

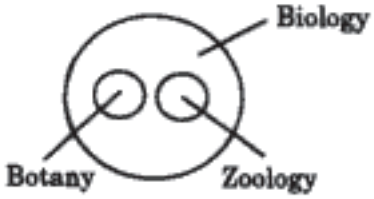


Fig. 51

53. (*c*) : Some *educated* are *citizens*. Some *citizens* are *educated*. But, both *educated* and *citizens* are *men*. (Fig. 52)

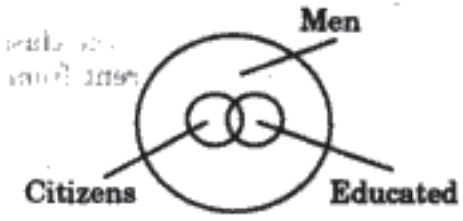


Fig. 52

54. (*a*) : *Pencil* is an item of *Stationery*. But, *Jeep* is entirely different. (Fig. 53)

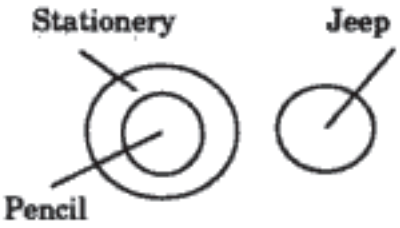


Fig. 53

55. (*e*) : *Machinery* and *product* are entirely different. But, both are present in a *factory*. (Fig. 54)

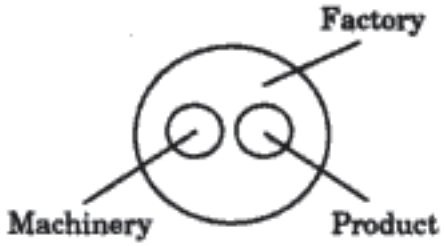


Fig. 54

56. (*e*) : *Brinjal* and *Cauliflower* are entirely different. But, both are *vegetables*. (Fig. 55)

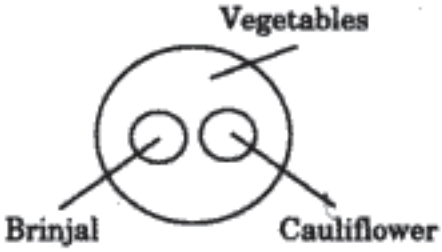


Fig. 55

57. (*d*) : Aptitude, intelligence and honesty are entirely different.

58. (*c*) : *Truck* and *Ship* are entirely different. But, some *goods* are carried by some *trucks* and some *goods* are carried by some *ships*. (Fig. 56)

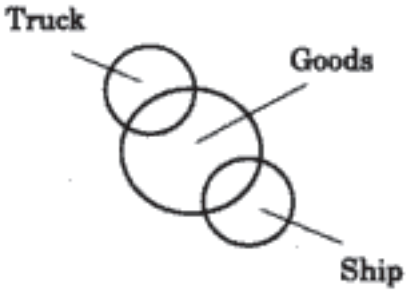


Fig. 56

59. (*c*) : This group of items can be represented as in Fig. 57.
Since there is no such diagram in the question, so (*c*) is the answer.

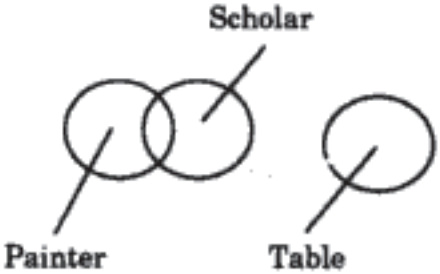


Fig. 57

60. (*a*) : This group of items can be represented as in Fig. 58.
Since there is no such diagram in the question, so (*a*) is the answer.

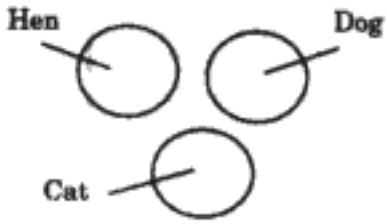


Fig. 58

61. (*c*) : This group of items can be represented as in Fig. 59.
Since there is no such diagram in the question, so (*c*) is the answer.

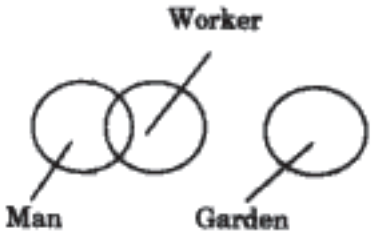


Fig. 59

62. (*b*) : This group of items can be represented as in Fig. 60.
Since there is no such diagram in the question, so (*b*) is the answer.

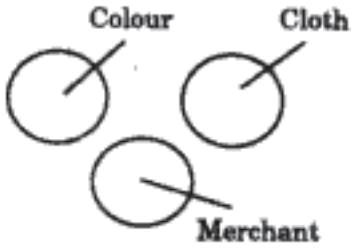


Fig. 60

63. (*d*) : This group of items can be represented as in Fig. 61.
Since there is no such diagram in the question, so (*d*) is the answer.

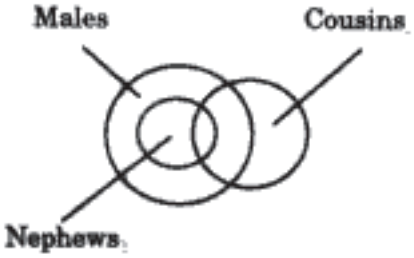


Fig. 61

64. (*c*) : This group of items can be represented as in Fig. 62.
Since there is no such diagram in the question, so (*c*) is the answer.

Fig. 62

65. (*a*) : This group of items can be represented as in Fig. 63.
Since there is no such diagram in the question, so (*a*) is the answer.

Fig. 63

66. (*c*) : This group of items can be represented as in Fig. 64.
Since there is no such diagram in the question, so (*c*) is the answer.

Fig. 64

67. (*b*) : This group of items can be represented as in Fig. 65.
Since there is no such diagram in the question, so (*b*) is the answer.

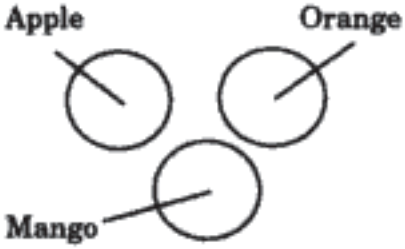


Fig. 65

68. (*c*) : This group of items can be represented as in Fig. 66.
Since there is no such diagram in the question, so (*c*) is the answer.

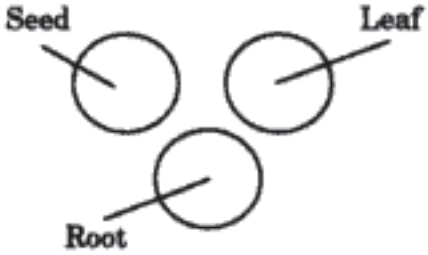


Fig. 66

69. (*a*) : Here P is Loaf, Q is Wheat and R is Barley.
70. (*c*) : Here P is Singer, Q is Writer and R is Actor.
71. (*a*) : Here P is Army, Q is Soldier and R is Engineer.
72. (*a*) : Here P is Furniture, Q is Wood and R is Steel.
73. (*c*) : Here P is Researcher, Q is Historian and R is Scholar.
74. (*d*) : Here P is Quadruped, Q is Tiger and R is Elephant.
75. (*a*) : Some *doctors* and some *actors* are *males*. But, *doctor* and *actor* are entirely different.
76. (*b*) : Both *Rose* and *Lotus* are *flowers*. But, *Rose* and *Lotus* are entirely different.
77. (*c*) : *Father, Mother* and *Child* are entirely different.
78. (*a*) : Some *ornaments* are made of *gold* and some of *silver*. *Gold* and *Silver* are entirely different.
79. (*c*) : Some *girls* can be *athletes*.
Some *athletes* can be *singers*.
Some *girls* can be *singers*.

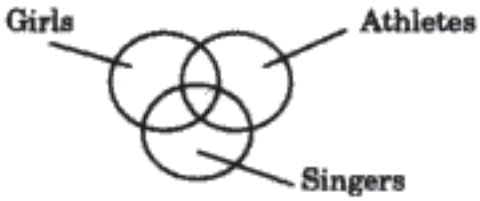


Fig. 67

80. (*b*) : Both *wall* and *window* are parts of a *room*.
But, *wall* and *window* are entirely different.

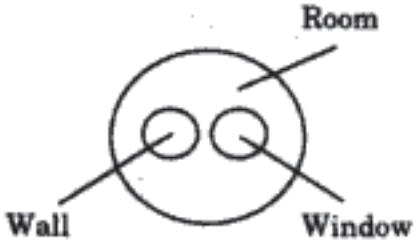


Fig. 68

81. (*a*) : A *city* lies within a *state*, which lies within a *country*.

Fig. 69

82. (*d*) : Some *wires* are made of *copper*. But, *Paper* is entirely different.

83. (*c*) : All three items are partly related to each other.

Fig. 70

84. (*b*) : Both *vertebrates* and *non-vertebrates* are entirely different, but both are *living beings*.

85. (*d*) : Some *teachers* and some *doctors* are *women*. But, *Teacher* and *Doctor* are entirely different.

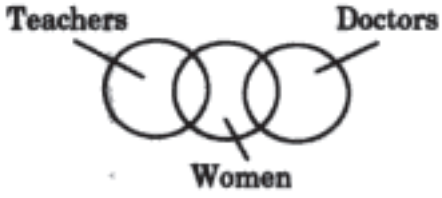


Fig. 71

86. (*a*) : The given situation can be represented as under :

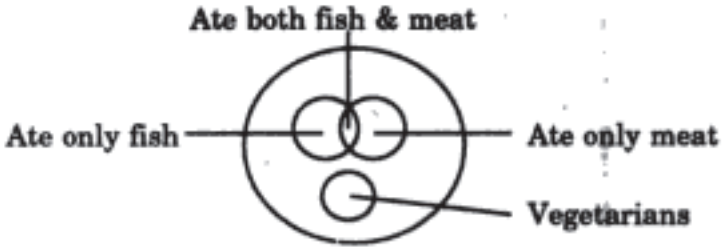
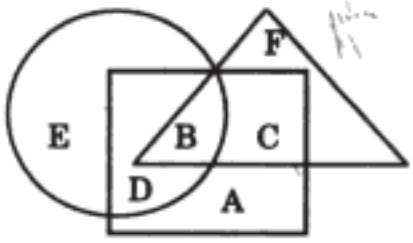


Fig. 72

TYPE-2

In this type of questions, generally a Venn diagram is given. Each geometrical figure in the diagram represents a certain class. The candidate is required to study and analyse the figure carefully and then answer certain questions regarding the given data.

Example 1 : ***In the following diagram, three classes of population are represented by three figures. The triangle represents the school teachers, the square represents the married persons and the circle represents the persons living in joint families.***



1. Married persons living in joint families but not working as school teachers are represented by

(*a*) C (*b*) F (*c*) D (*d*) A

Sol. Married persons living in joint families are represented by the region common to the square and the circle *i.e.*, D and B. But, according to the given conditions, the persons should not be school teachers. So, B is to be excluded. Hence, the required condition is denoted by region D. So, the answer is (*c*).

2. Persons who live in joint families, are unmarried and who do not work as school teachers are represented by

(*a*) C (*b*) B (*c*) E (*d*) D

Sol. Persons living in joint families are represented by the circle. According to the given conditions, the persons should be unmarried and not working as school teachers. So, the region should not be a part of either the square or the triangle. Thus, the given conditions are satisfied by the region E. So, the answer is (*c*).

3. Married teachers living in joint families are represented by

(*a*) C (*b*) B (*c*) D (*d*) A

Sol. Married teachers are represented by the region common to the square and the triangle *i.e.*, B and C. But, according to the given conditions, the persons should be living in joint families. So, the required region should be a part of the circle. Since B lies inside the circle, so the given conditions are satisfied by the persons denoted by the region B. Hence, the answer is (*b*).

4. School teachers who are married but do not live in joint families are represented by

(*a*) C (*b*) F (*c*) A (*d*) D

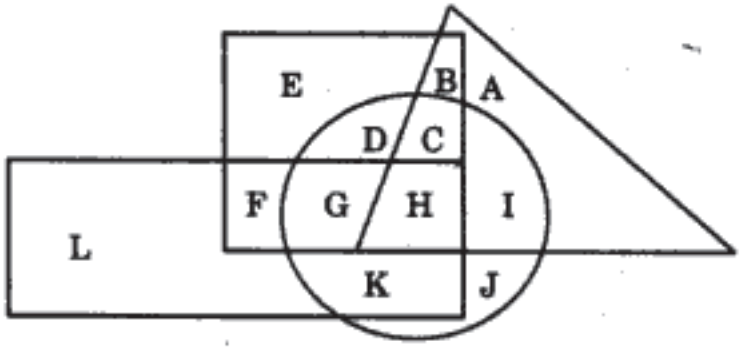
Sol. As in the above question, married teachers are represented by B and C. But, here, the given conditions lay down that the persons should not be living in joint families. So, the required region should lie outside the circle. Since C lies outside the circle, so the given conditions are satisfied by the persons denoted by the region C. Hence, the answer is (*a*).

5. School teachers who are neither married nor do live in joint families are represented by

(*a*) F (*b*) C (*c*) B (*d*) A

Sol. School teachers are represented by the triangle. But according to the given conditions, persons are neither married nor do they live in joint families. So, the region should not be a part of either the square or the circle. Such a region is F. Hence, the answer is (*a*).

Example 2 : ***In the following diagram, the square represents girls, the circle tall persons, the triangle is for tennis players and the rectangle stands for the swimmers.***



On the basis of the above diagram, answer the following questions.

1. Which letter represents tall girls who are swimmers but don't play tennis ?

(*a*) C (*b*) D (*c*) G (*d*) H

Sol. Tall girls, who are swimmers are represented by the region common to the square, circle and the rectangle *i.e.*, G and H. But, according to the given conditions, the girls shouldn't be tennis players. So, the required region should not be a part of the triangle *i.e.*, H should be excluded. Thus, the region representing the persons satisfying the given conditions is G. Hence, the answer is (*c*).

2. Which letter represents girls who are swimmers, play tennis but are not tall ?

(*a*) B (*b*) E (*c*) F (*d*) None of these

Sol. Girls who are swimmers and play tennis are represented by the region common to the square, triangle and rectangle *i.e.*, H. But, it is given that the girls shouldn't be tall. So, the required region should not be a part of the circle. Since H is a part of the circle, so the answer is (*d*).

3. Which letter represents tall girls who do not play tennis and are not swimmers ?

(*a*) C (*b*) D (*c*) E (*d*) G

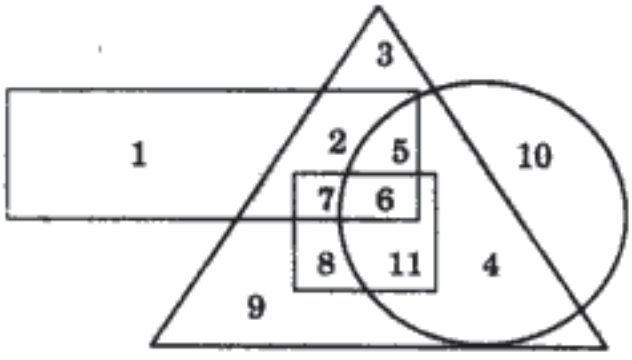
Sol. Tall girls are represented by the region common to the square and the circle *i.e.*, D, C, G and H. But, according to the given conditions, the girls are neither tennis players nor swimmers. So, the required region should be neither a part of the rectangle nor the triangle. G lies inside the rectangle, C inside the triangle and H is common to both. So, the answer is (*b*).

4. Which letter represents tall persons who are gents and swimmers but do not play tennis ?

(*a*) I (*b*) J (*c*) K (*d*) L

Sol. The tall persons are represented by regions inside the circle *i.e.*, C, D, G, H, I, J and K. Since the persons are not girls and do not play tennis, so the region should not be a part of either the square or the triangle. Thus, C, D, G, H should be excluded. Also, according to the given conditions, the persons should be swimmers. So, the required region should be a part of the rectangle and such a region is K. Hence, the answer is (*c*).

Example 3 : *The following questions are based on the diagram given below :*



(1) The rectangle represents government employees.

(2) The triangle represents urban people.

(3) The circle represents graduates.

(4) The square represents clerks.

1. Which of the following statements is true ?

(*a*) All government employees are clerks.

(*b*) Some government employees are graduates as well as clerks.

(*c*) All government employees are graduates.

(*d*) All clerks are government employees but not graduates.

Sol. The above cases may be considered as under :

For statement (*a*) to be true, the rectangle should lie inside the square. This is not true. Hence, (*a*) is false.

For statement (*b*) to be true, there should be a region common to the rectangle, circle and the square. Such a region is 6. Hence, (*b*) is true.

Further, for statement (*c*) to be true, the rectangle should lie inside the circle. So, (*c*) is false.

For statement (*d*) to be true, square should lie wholly inside the rectangle, with no region common to the circle. This is not true. So, (*d*) is false.

2. Which of the following statements is true ?

(*a*) All urban people are graduates.

(*b*) Some clerks are government employees but not urban.

(*c*) All government employees are clerks.

(*d*) Some urban people are not graduates.

Sol. For the validity of condition (*a*), the triangle should lie inside the circle. This is not true. So, (*a*) is false.

For the validity of statement (*b*), there should be a region which is common to the square and the rectangle but is not a part of the triangle. Since no such region exists, (*b*) is false.

For the validity of statement (*c*), the rectangle should lie inside the square. This is not true. So, (*c*) is false.

For the validity of statement (*d*), some region of the triangle should lie outside the circle. Since this is true, so, (*d*) is true.

3. Choose the correct statement :

(*a*) Some clerks are government employees.

(*b*) No clerk is urban.

(*c*) All graduates are urban.

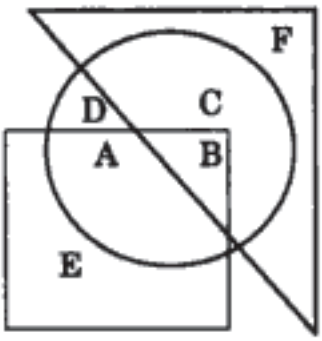
(*d*) All graduates are government employees.

Sol. For the validity of statement (*a*), there should be a region common to the square and rectangle. Such regions are 6 and 7. So, (*a*) is true.

Further, for statement (*b*) to be true, there should be no region common to the square and the triangle. But since square lies wholly inside the triangle, (*b*) is false. For statement (*c*) to be true, circle should lie inside the triangle. Clearly, (*c*) is false. For the validity of statement (*d*), the circle should lie inside the rectangle. Clearly, (*d*) is false.

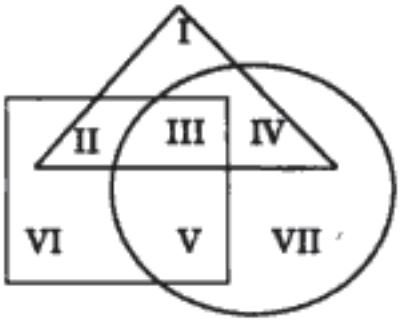
EXERCISE 9B

1. Which one of the following statements is correct with regard to the given figure ? **(S.C.R.A. 1994)**



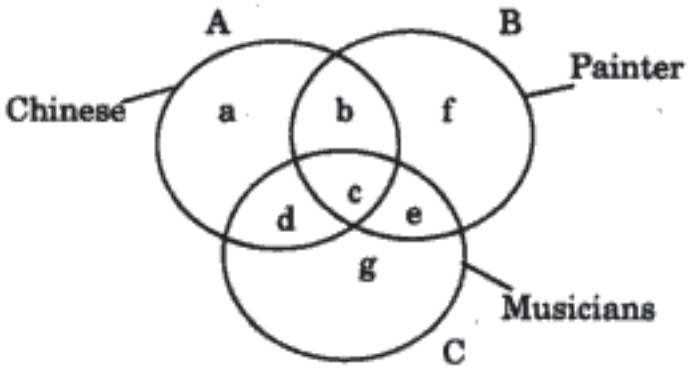
(*a*) A and B are in all the three shapes.
(*b*) E, A, B, C are in all the three shapes.
(*c*) F, C, D, B, A are in all the three shapes.
(*d*) Only B is in all the three shapes.

2. The triangle, square and circle shown below respectively represent the urban, hard working and educated people. Which one of the areas marked I-VII is represented by the urban educated people who are not hard working ?
(Civil Services, 1992)



(*a*) II (*b*) I (*c*) IV (*d*) III

Directions (*Questions 3 to 6*) : *In the figure given below, there are three intersecting circles each representing certain section of people. Different regions are marked a—g. Read the statements in each of the following questions and choose the letter of the region which correctly represents the statement.*



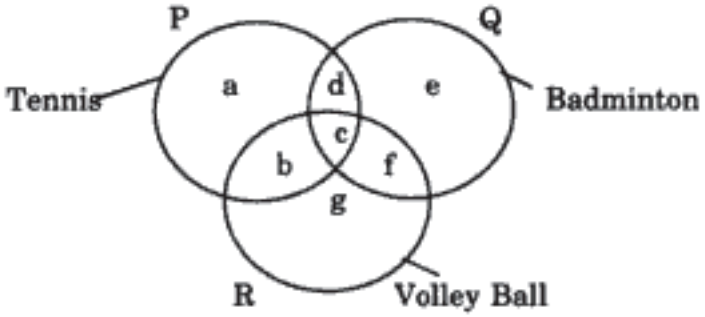
3. Chinese who are painters but not musicians.
(*a*) b (*b*) c (*c*) d (*d*) g

4. Painters who are neither Chinese nor musicians.
(*a*) b (*b*) c (*c*) f (*d*) g

5. Chinese who are musicians but not painters.
(*a*) d (*b*) c (*c*) b (*d*) a

6. Chinese who are painters as well as musicians.
(*a*) a (*b*) b (*c*) c (*d*) d

Directions (*Questions 7 to 10*) : *The figure given below consists of three intersecting circles which represent sets of students who play Tennis, Badminton and Volley Ball. Each region in the figure is represented by a small letter.*



On the basis of the above figure, answer the questions given below.

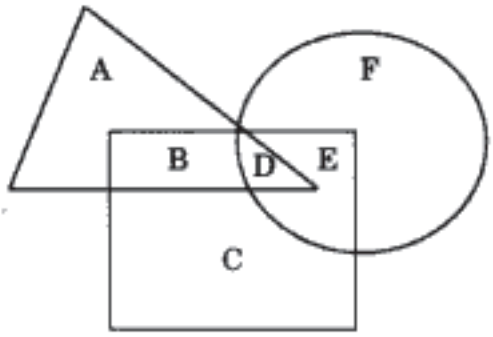
7. Which letter represents the set of persons who play all the three games ?
(*a*) b (*b*) c (*c*) f (*d*) g

8. Which letter represents the set of persons who play Tennis and Volley Ball but not Badminton ?
(*a*) g (*b*) e (*c*) c (*d*) b

9. Which letter represents the set of persons who play Tennis but neither Badminton nor Volley Ball ?
(*a*) a (*b*) b (*c*) c (*d*) d

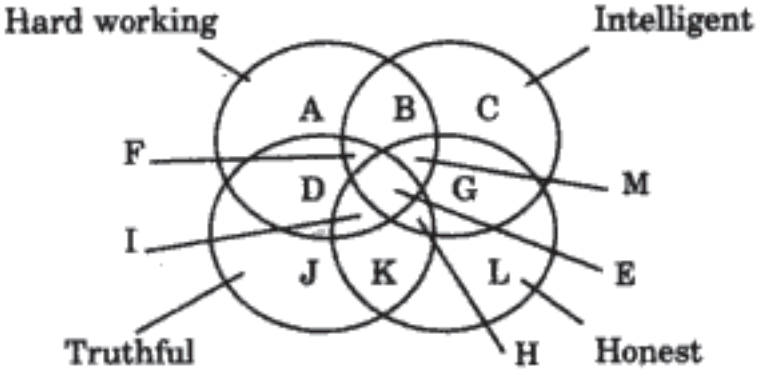
10. Which letter represents the set of persons who play Tennis and Badminton but not Volley Ball ?
(*a*) b (*b*) c (*c*) d (*d*) f

11. In the given figure, the triangle represents girls, the square represents sports persons and the circle represents coaches. The portion in the figure which represents girls, who are sports persons but not coaches is the one labelled
(I.A.S. 1996)



(*a*) A (*b*) B (*c*) D (*d*) E

Directions (*Questions 12 to 16*) : *Below is given a figure with four intersecting circles, each representing a group of persons having the quality written against it. Study the figure carefully and answer the questions that follow.*



12. The region which represents the people who are intelligent, honest and truthful but not hard working is denoted by
(*a*) E (*b*) F (*c*) H (*d*) I

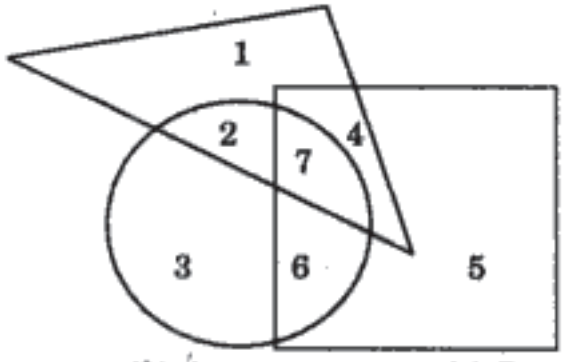
13. The people possessing all the qualities are represented by
(*a*) I (*b*) H (*c*) F (*d*) E

14. The region which represents people who are not honest but possess all other three qualities, is denoted by
(*a*) B (*b*) D (*c*) F (*d*) I

15. People who are not hard working, intelligent and truthful are represented by
(*a*) G (*b*) H (*c*) K (*d*) L

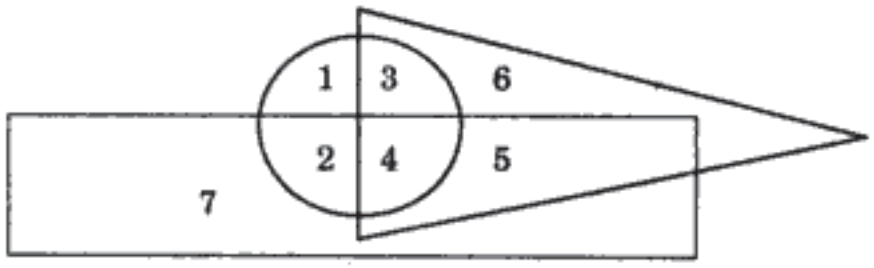
16. People who are not honest and truthful but are hard working and intelligent both, are represented by
(*a*) E (*b*) B (*c*) M (*d*) I

17. If Tall is equivalent to circle, Armymen to triangle and Strong to square, indicate which number will represent strong armymen ? **(I.A.S. 1982)**



(*a*) 3 (*b*) 4 (*c*) 5 (*d*) 6

Directions (*Questions 18 to 21*) : *In the figure given below, the circle represents young persons, the triangle represents uneducated persons and the rectangle represents employed persons.*



Study the figure carefully and answer the questions given below.

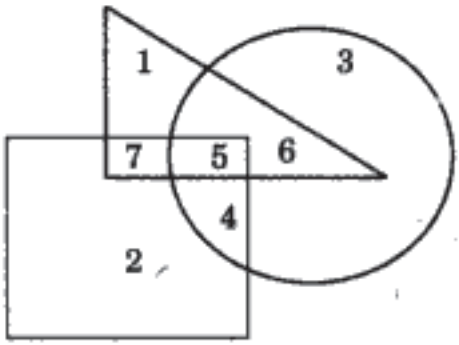
18. Which region represents young, uneducated and employed persons ?
(*a*) 6 (*b*) 5 (*c*) 4 (*d*) 3 (*e*) 2

19. The region which represents educated, employed young persons, is denoted by
(*a*) 2 (*b*) 3 (*c*) 4 (*d*) 5 (*e*) 6

20. Which region represents young, educated and unemployed persons ?
(*a*) 7 (*b*) 4 (*c*) 1 (*d*) 5 (*e*) 3

21. Which region represents young, uneducated and unemployed persons ?
(*a*) 1 (*b*) 2 (*c*) 6 (*d*) 3 (*e*) 5

Directions (*Questions 22 to 24*) : *The following questions are based on the diagram given below. In the diagram, the triangle stands for graduates, square stands for membership of professional organisations and the circle stands for membership of social organisations. Read each statement and find out the appropriate number(s) to represent the people covered by the given statement.* **(Assistant Grade, 1994)**

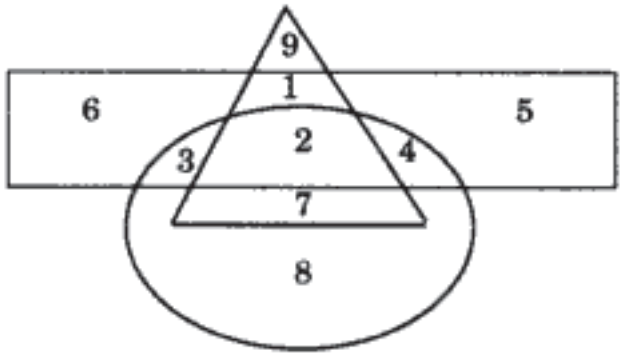


22. Number of graduates in social organisations
(*a*) 1 (*b*) 5 (*c*) 6 (*d*) 5 and 6

23. Number of graduates in social organisations only
(*a*) 3 (*b*) 4 (*c*) 5 (*d*) 6

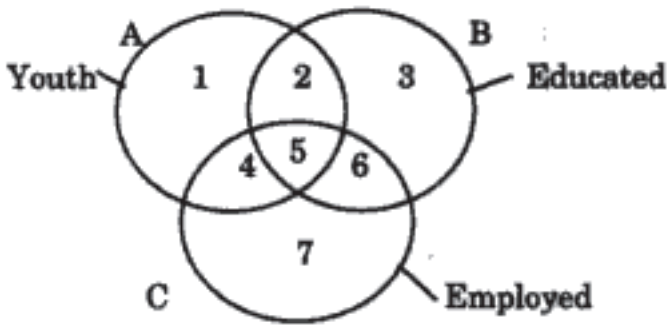
24. Number of graduates in professional organisations
(*a*) 5 and 7 (*b*) 5, 6 and 7 (*c*) 6 and 7 (*d*) 4, 5 and 6

25. In the figure given below, triangle represents the women, rectangle represents the employed and circle represents the doctors, find out the area of the figure which represents women doctors who are not employed. **(C.B.I. 1993)**



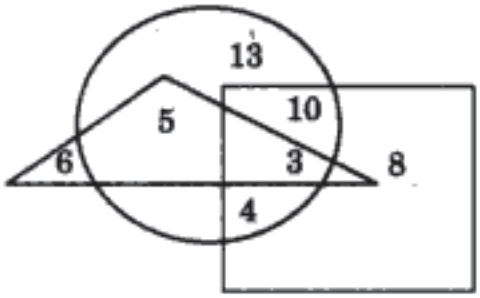
(*a*) 1 (*b*) 3 (*c*) 7 (*d*) 8

26. Study the diagram below and identify the region representing youth who are employed but not educated. **(S.S.C. 1995)**



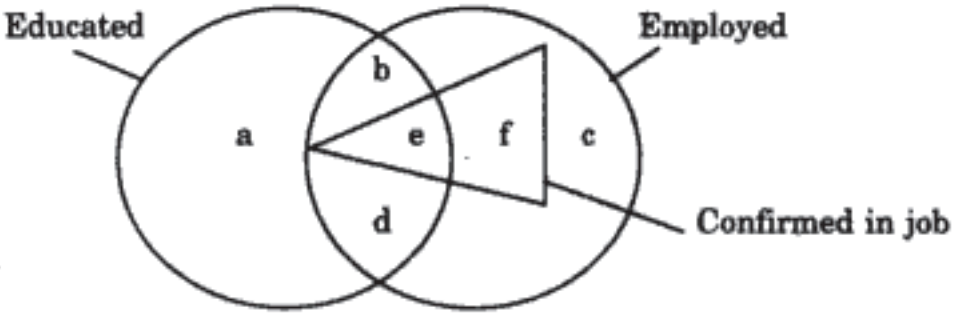
(*a*) 4 only (*b*) 1, 4, 7 (*c*) 4, 7 (*d*) 4, 5, 6

27. In the following diagram, parallelogram represents women, triangle represents sub-inspectors of police and circle represents graduates. Which numbered area represents women graduate sub-inspectors of police ? **(C.B.I. 1994)**



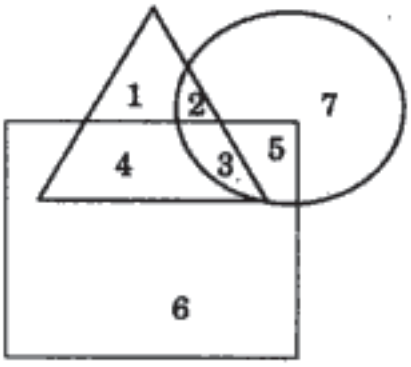
(*a*) 5 (*b*) 3 (*c*) 8 (*d*) 13

28. Read the figure and find the region representing persons who are educated and employed but not confirmed. **(Assistant Grade, 1993)**



(*a*) a, c (*b*) a, b, c (*c*) b, d (*d*) a, d, c

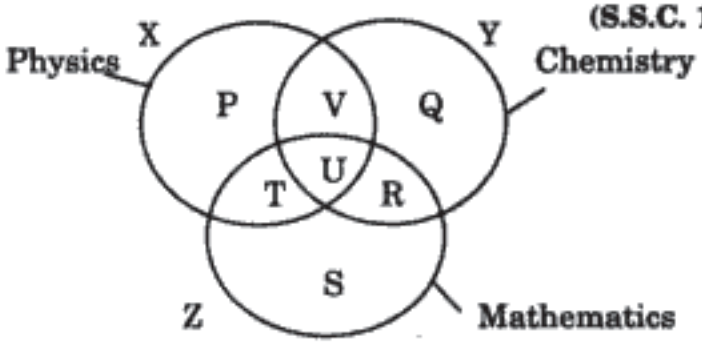
29. In the figure given below, triangle represents the healthy, square represents the old and circle represents the men. Find out the area of the figure which represents the men who are healthy but not old ? **(C.B.I. 1993)**



(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 7

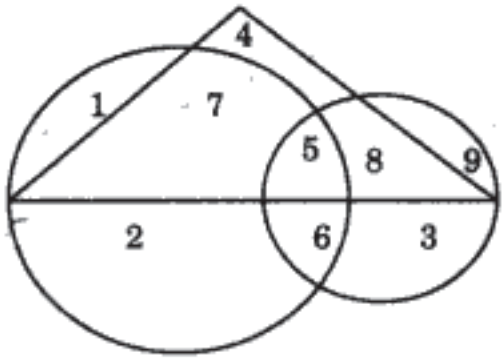
30. The diagram below represents the students who study Physics, Chemistry and Mathematics. Study the diagram and identify the region which represents the students who study Physics and Mathematics but not Chemistry.

(S.S.C. 1995; I.A.S. 1995)



(*a*) T (*b*) P + T + S (*c*) V (*d*) P + T + S + R + U + V

Directions (*Questions 31 to 35*) : *The following five questions are based on the following diagram in which the triangle represents female graduates, small circle represents self-employed females and the big circle represents self-employed females with bank loan facility. Numbers are shown in the different sections of the diagram. On the basis of these numbers, answer the following :* **(M.B.A. 1997)**



31. How many female graduates are self-employed ?
(*a*) 12 (*b*) 13 (*c*) 15 (*d*) 20

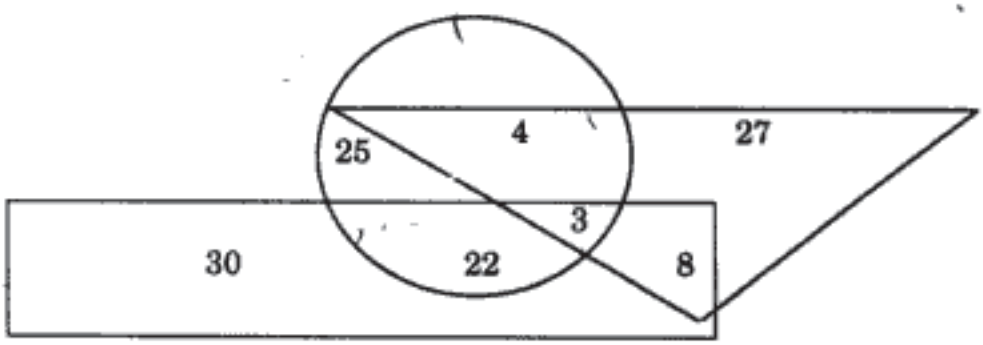
32. How many female graduates are not self-employed ?
(*a*) 4 (*b*) 10 (*c*) 12 (*d*) 15

33. How many non-graduate females are self-employed ?
(*a*) 9 (*b*) 11 (*c*) 12 (*d*) 21

34. How many self-employed female graduates are with bank loan facility ?
(*a*) 5 (*b*) 7 (*c*) 12 (*d*) 20

35. How many non-graduate self-employed females are with bank loan facility ?
(*a*) 3 (*b*) 8 (*c*) 9 (*d*) 12

Directions (*Questions 36 to 40*) : *Study the following figure carefully and answer the questions given below it. The rectangle represents artists, the circle represents players and the triangle represents doctors.*



36. How many players are neither artists nor doctors ?
(*a*) 3 (*b*) 8 (*c*) 22 (*d*) 25

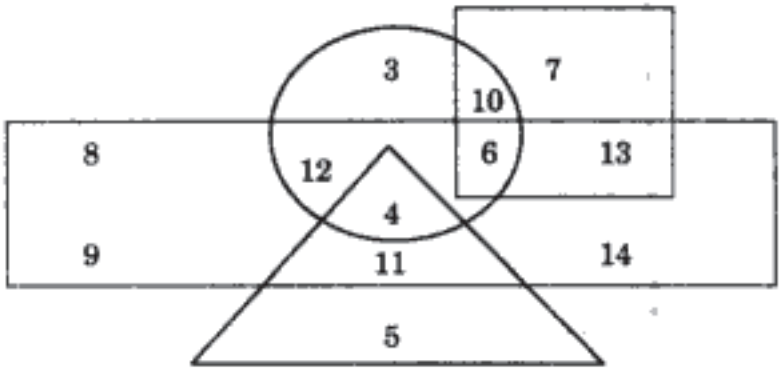
37. How many artists are players ?
(*a*) 30 (*b*) 29 (*c*) 25 (*d*) 22

38. How many doctors are both players and artists ?
(*a*) 3 (*b*) 4 (*c*) 8 (*d*) 11

39. How many doctors are neither players nor artists ?
(*a*) 30 (*b*) 27 (*c*) 22 (*d*) 8

40. How many artists are neither players nor doctors ?
(*a*) 22 (*b*) 24 (*c*) 29 (*d*) 30

Directions (*Questions 41 to 48*) : *The following questions are based on the diagram given below :* **(I.A.S. 1985)**



(1) Rectangle represents males.
(2) Triangle represents educated.
(3) Circle represents urban.
(4) Square represents civil servants.

41. Who among the following is an educated male who is not an urban resident ?
(*a*) 4 (*b*) 5 (*c*) 9 (*d*) 11

42. 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

43. Who among the following is a female, urban resident and also a civil servant ?
(*a*) 6 (*b*) 7 (*c*) 10 (*d*) 13

44. Who among the following is an educated male who hails from urban area ?
(*a*) 4 (*b*) 2 (*c*) 11 (*d*) 5

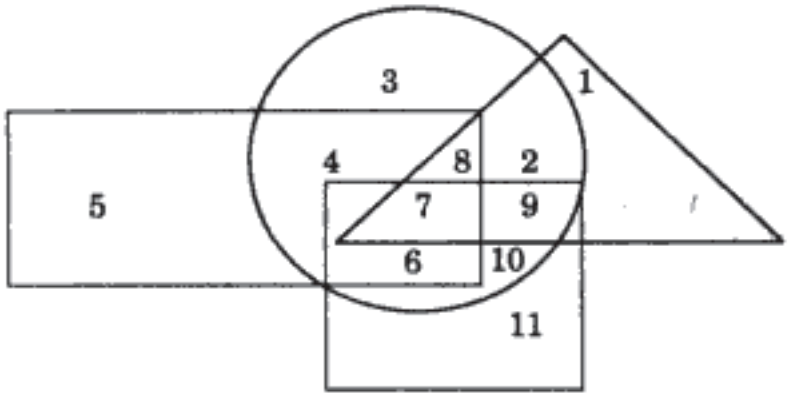
45. Who among the following is uneducated and also an urban male ?
(*a*) 2 (*b*) 3 (*c*) 11 (*d*) 12

46. Who among the following is only a civil servant but not a male nor urban oriented and uneducated ?
(*a*) 7 (*b*) 8 (*c*) 9 (*d*) 14

47. 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

48. Who among the following is a male civil servant, who is neither educated nor belongs to urban area ?
(*a*) 7 (*b*) 13 (*c*) 4 (*d*) 1

Directions (*Questions 49 to 53*) : *In the following figure, rectangle, square, circle and triangle represent the regions of wheat, gram, maize and rice cultivation respectively. On the basis of the above figure, answer the following questions.*



49. Which area is cultivated by all the four commodities ?
(*a*) 7 (*b*) 8 (*c*) 9 (*d*) 2

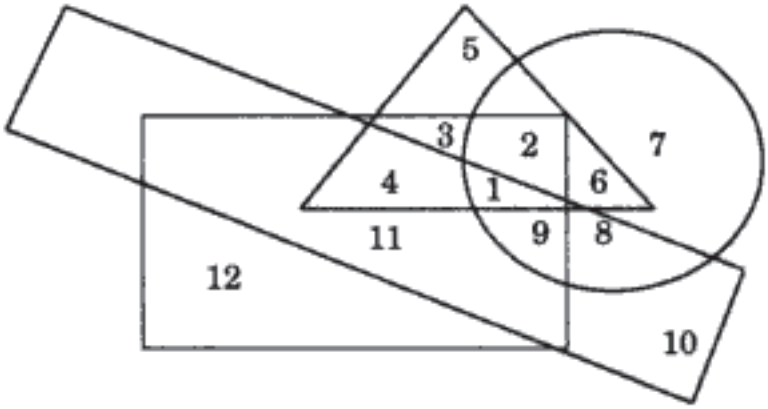
50. Which area is cultivated by wheat and maize only ?
(*a*) 8 (*b*) 6 (*c*) 5 (*d*) 4

51. Which area is cultivated by rice only ?
(*a*) 5 (*b*) 1 (*c*) 2 (*d*) 11

52. Which area is cultivated by maize only ?
(*a*) 10 (*b*) 2 (*c*) 3 (*d*) 4

53. Which area is cultivated by rice and maize and nothing else ?
(*a*) 9 (*b*) 8 (*c*) 2 (*d*) 7

Directions (*Questions 54 to 63*) : *In the following figure, the circle stands for employed, the square stands for hard working, the triangle stands for rural and the rectangle stands for intelligent. Study the figure carefully and answer the questions that follow.*



54. Non-rural, employed, hard working and intelligent people are indicated by region
(*a*) 8 (*b*) 9 (*c*) 10 (*d*) 11 (*e*) 12

55. Non-rural, employed people who are neither intelligent nor hard working are represented by region
(*a*) 12 (*b*) 11 (*c*) 10 (*d*) 7 (*e*) 5

56. Intelligent, employed and hard working non-rural people are indicated by region
(*a*) 11 (*b*) 6 (*c*) 9 (*d*) 4 (*e*) 3

57. Hard working non-rural people who are neither employed nor intelligent are shown by region
(*a*) 8 (*b*) 7 (*c*) 6 (*d*) 10 (*e*) 12

58. Employed, hard working and intelligent rural people are indicated by region
(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4 (*e*) 5

59. Rural hard working people who are neither employed nor intelligent are indicated by region
(*a*) 6 (*b*) 5 (*c*) 4 (*d*) 3 (*e*) 2

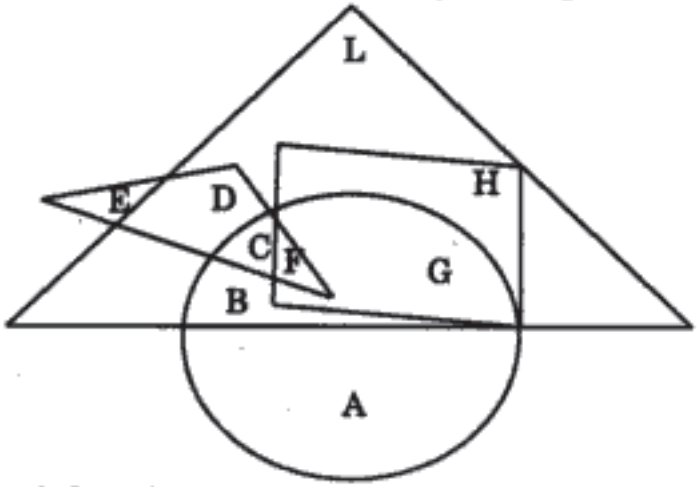
60. Rural employed people who are neither intelligent nor hard working are indicated by region
(*a*) 2 (*b*) 4 (*c*) 6 (*d*) 9 (*e*) 10

61. Rural people who are hard working and employed but not intelligent are indicated by region
(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4 (*e*) 5

62. Unemployed rural hard working and intelligent people are indicated by region
(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4 (*e*) 5

63. Rural employed people who are neither intelligent nor hard working are indicated by region
(*a*) 10 (*b*) 9 (*c*) 6 (*d*) 4 (*e*) 2

Directions (*Questions 64 to 67*) : *In the following figure, the smaller triangle represents the teachers; the big triangle, the politicians; the circle, the graduates and the rectangle, the members of Parliament. Different regions are being represented by the letters of English alphabet.* **(S.S.C. 1992)**



On the basis of the above diagram, answer the following questions :

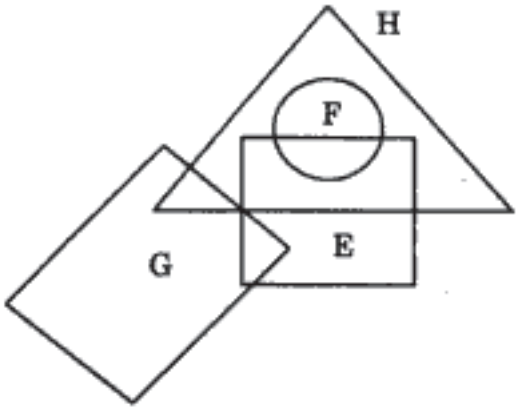
64. Who among the following are graduates or teachers but not politicians ?
(*a*) B, G (*b*) G, H (*c*) A, E (*d*) E, F

65. Who among the following politicians are graduates but not the members of Parliament ?
(*a*) B, C (*b*) L, B (*c*) D, L (*d*) A, H, L

66. Who among the following politicians are neither teachers nor graduates ?
(*a*) E, F (*b*) D, E (*c*) C, D (*d*) L, H

67. Who among the following members of Parliament is a graduate as well as a teacher ?
(*a*) G (*b*) F (*c*) C (*d*) H

Directions (*Questions 68 to 70*) : *These questions are based on the following diagram :* (M.B.A. 1998)



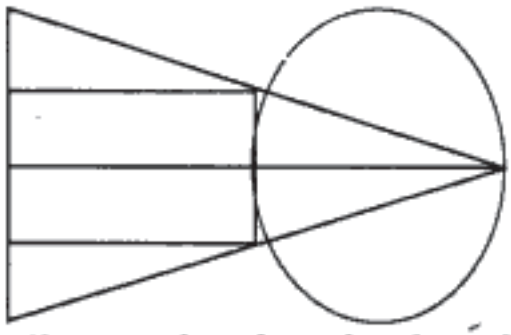
The triangle stands for Hindi-speaking people, circle for French-speaking, square for English-speaking and rectangle for German-speaking people.

68. In the above diagram, which one of the following statements is true ?
(*a*) All French-speaking people speak German.
(*b*) All French-speaking people speak English.
(*c*) All German-speaking people speak English and Hindi.
(*d*) All French-speaking people speak Hindi also.

69. In the diagram, which one of the following statements is true ?
(*a*) There are some people who speak all four languages.
(*b*) Some German-speaking people can speak either Hindi or English.
(*c*) Some English-speaking people cannot speak all the languages.
(*d*) All Hindi-speaking people speak French but not German.

70. In the above diagram, which one of the following statements is not true ?
(*a*) German-speaking people cannot speak French.
(*b*) No French-speaking people can speak German.
(*c*) Some Hindi-speaking people can speak French, English and German as well.
(*d*) Some French-speaking people can speak Hindi and English but not German.

Directions (*Questions 71 to 75*) : *The following figure represents a set of persons — the triangle represents educated persons, the rectangle represents policemen, the bigger ellipse represents road tax payers and smaller ellipse represents shopkeepers.* (Delhi Police, 1988)



The following questions are based on the above diagram.

71. Looking at the given figure, it can be said that
- (*a*) some persons who are neither shopkeepers nor policemen are educated.
- (*b*) some persons who are either shopkeepers or policemen, pay road tax, though uneducated.
- (*c*) some persons who are either shopkeepers or policemen pay road tax and are also educated.
- (*d*) all the above statements are correct.

72. According to this figure, it follows that
- (*a*) policemen do not pay road tax.
- (*b*) shopkeepers do not pay road tax.
- (*c*) some shopkeepers are educated.
- (*d*) some policemen are shopkeepers.

73. From the above figure, it can be concluded that
- (*a*) all educated policemen pay road tax.
- (*b*) all educated shopkeepers pay road tax.
- (*c*) all road tax paying policemen are educated.
- (*d*) all road tax paying shopkeepers are educated.

74. Looking at the given figure, it can be said that
- (*a*) some of the uneducated policemen pay road tax.
- (*b*) some of the educated shopkeepers pay road tax.
- (*c*) some of the road tax payee policemen are shopkeepers too.
- (*d*) some of the road tax payee shopkeepers are policemen too.

75. On the basis of this figure, it can be concluded that
- (*a*) none of the educated shopkeepers is a policeman though an uneducated policeman is a shopkeeper.
- (*b*) some of the educated shopkeepers are road tax payers even though they discharge duties of a policeman.
- (*c*) some of the educated policemen who pay road tax are sharing profits with uneducated shopkeepers.
- (*d*) none of the educated shopkeepers is a policeman nor an educated policeman a shopkeeper.

ANSWERS

1. (*d*) : B is the region common to the circle, square and triangle.

2. (*c*) : The required region is the one which is common to the triangle and the circle but is not a part of the square *i.e.* IV.

3. (*a*) : The required region is the one which is common to the circles A and B and lies outside circle C *i.e. b.*

4. (*c*) : The required region is the one which lies inside the circle B but is not a part of either circle A or circle C *i.e. f.*

5. (*a*) : The required region is the one which is common to the circles A and C but is not a part of circle B *i.e. d.*

6. (*c*) : The required region is the one common to all the three circles *i.e. c.*

7. (*b*) : The required region is the one common to all the three circles *i.e. c.*

8. (*d*) : The required region is the one which is common to circles P and R but is not a part of circle Q. *i.e. b.*

9. (*a*) : The required region is the one which lies inside circle P but is not common to circle Q or circle R or both *i.e. a.*

10. (*c*) : The required region is the one which is common to circles P and Q but lies outside circle R *i.e., d.*

11. (*b*) : The required region is the region which is common to the triangle and square but lies outside the circle *i.e., B.*

12. (*c*) : The required region is the one which is common to the circles 2, 3 and 4 but is not a part of circle 1 *i.e. H.*

13. (*d*) : The required region is the one which is common to all the four circles *i.e. E.*

14. (*c*) : The required region is the one which is common to the circles 1, 2 and 4 but lies outside circle 3 *i.e. F.*

15. (*d*) : The required region is the one which does not lie inside circles 1, 2 and 4. *i.e. L.*

16. (*b*) : The given conditions are satisfied by the persons denoted by the region which is common to circles 1 and 2 but is not a part of either circle 3 or circle 4 *i.e. B.*

17. (*b*) : Strong armymen will be represented by the region which is common to the square and the triangle but lies outside the circle *i.e.* 4.

18. (*c*) : The given set of persons is denoted by the region common to the circle, the triangle and the rectangle *i.e.* 4.

19. (*a*) : The given set of persons is denoted by the circular region contained in the rectangle but outside the triangle *i.e.* 2.

20. (*c*) : The given set of persons is denoted by the circular region outside the triangle and the rectangle *i.e.* 1.

21. (*d*) : The given set of persons is denoted by the circular region inside the triangle and outside the rectangle *i.e.* 3.

22. (*d*) : The required region is the one common to the circle and triangle *i.e.* regions 5 and 6.

23. (*d*) : The required region is the one which is common to the triangle and circle but lies outside the square *i.e.* 6.

24. (*a*) : The required region is the one common to the triangle and square *i.e.* regions 5 and 7.

25. (*c*) : The required region is the one which is common to the triangle and circle but lies outside the rectangle *i.e.* 7.

26. (*a*) : The required region is the one which is common to the circles A and C but lies outside circle B *i.e.* 4.

27. (*b*) : The required region is the one common to the parallelogram, triangle and circle *i.e.* 3.

28. (*c*) : The required region is the one which is common to the two circles but lies outside the triangle *i.e.*, regions *b* and *d.*

29. (*b*) : The required region is the one which is common to the triangle and circle but lies outside the square *i.e.* 2.

30. (*a*) : The required region is the one which is common to circles *X* and *Z* but lies outside circle *Y i.e. T.*

31. (*d*) : The region common to the triangle and any of the two circles represents the number of self-employed female graduates. It is $8 + 5 + 7 = 20$.

32. (*a*) : The region lying inside the triangle but outside both the circles represents the number of female graduates who are not self-employed. It is 4.

33. (*d*) : The regions lying outside the triangle but inside any of the two circles represents the number of non-graduate, self-employed females. It is $(9 + 3 + 6 + 2 + 1) = 21$.

34. (*c*) : The region common to the triangle and the bigger circle represents the number of self-employed female graduates with bank loan facility. It is $7 + 5 = 12$.

35. (*c*) : The region lying outside the triangle but inside the bigger triangle represents the number of non-graduate self-employed females with bank loan facility. It is $(6 + 2 + 1) = 9$.

36. (*d*) : The region lying inside the circle but outside the triangle and the rectangle represents the number of players who are neither artists nor doctors. It is 25.

37. (*c*) : The region common to the circle and the rectangle represents the required set of persons. Thus, number of artists who are players = (22 + 3) = 25.

38. (*a*) : The region common to the circle, triangle and the square represents the required set of persons. Thus, number of doctors who are both players and artists = 3.

39. (*b*) : The region which lies inside the triangle but outside the circle and the rectangle represents the persons satisfying the given conditions. Thus, number of doctors who are neither players nor artists = 27.

40. (*d*) : The region which lies inside the rectangle but outside the triangle and the circle represents the required set of persons. Thus, number of artists who are neither players nor doctors = 30.

41. (*d*) : The person satisfying the given conditions is represented by the region which is common to the triangle and the rectangle but lies outside the circle *i.e.* 11.

42. (*b*) : The person satisfying the given conditions is represented by the region which lies inside the circle but outside the square, the rectangle and the triangle *i.e.* 3.

43. (*c*) : The person satisfying the given conditions is represented by the region which lies outside the rectangle and is common to the circle and the square *i.e.* 10.

44. (*a*) : The person satisfying the given conditions is represented by the region which is common to the triangle and the rectangle and also lies inside the circle *i.e.* 4.

45. (*d*) : The person satisfying the given conditions is represented by the region which lies outside the triangle and is common to the circle and the rectangle *i.e.* 12.

Remember : The condition which is not mentioned shouldn't be considered or assumed. For instance, here, 6 also denotes the required region. But since it lies inside the square and there is no mention of 'civil servant', so it cannot be the answer.

46. (*a*) : The person satisfying the given conditions is denoted by the region which lies inside the square but outside the circle, rectangle and triangle *i.e.* 7.

47. (*c*) : The person satisfying the given conditions is denoted by the region which is common to the rectangle, circle and the square but lies outside the triangle *i.e.* 6.

48. (*b*) : The person satisfying the given conditions is represented by the region common to the rectangle and the square but lying outside the triangle and the circle *i.e.* 13.

49. (*a*) : The required region is the one common to the rectangle, square, circle and the triangle *i.e.* 7.

50. (*d*) : The required region is the one which is common to only the rectangle and the circle and is not a part of either the triangle or the square *i.e.* 4.

51. (*b*) : The required region is the one which lies inside the triangle and outside the rectangle, square and circle *i.e.* 1.

52. (*c*) : The required region is the one which lies inside the circle but outside the rectangle, square and triangle *i.e.* 3.

53. (*c*) : The required region is the one which is common to only the triangle and the circle *i.e.* 2.

54. (*b*) : The required set of people is represented by the region which lies outside the triangle and is common to the circle, square and rectangle *i.e.* 9.

55. (*d*) : The required set of people is represented by the region which lies outside the triangle, inside the circle but outside the rectangle and the square *i.e.* 7.

56. (*c*) : The required set of people is represented by the region which is common to the rectangle, circle and square but lies outside the triangle *i.e.* 9.

57. (*e*) : The required set of people is denoted by the region which lies inside the square but outside the triangle, circle and rectangle *i.e.* 12.

58. (*a*) : The required set of people is denoted by the region common to the circle, square, rectangle and triangle *i.e.* 1.

59. (*d*) : The required set of people is represented by the region which is common to the triangle and the square but lies outside the circle and rectangle *i.e.* 3.

60. (*c*) : The required set of people is denoted by the region which is common to the triangle and the circle, but is not a part of either the rectangle or the square *i.e.* 6.

61. (*b*) : The required set of people is represented by the region which is common to the triangle, square and circle but is not a part of the rectangle *i.e.* 2.

62. (*d*) : The required set of people is represented by the region which lies outside the circle and is common to the triangle, square and rectangle *i.e.* 4.

63. (*c*) : The required set of people is denoted by the region which is common to the triangle and circle but is not a part of either the rectangle or the square *i.e.* 6.

64. (*c*) : The persons satisfying the given conditions are denoted by regions which lie inside the smaller triangle or the circle but outside the bigger triangle *i.e.* *A* and *E*.

65. (*a*) : The persons satisfying the given conditions are represented by regions which are common to the triangle and the circle but lies outside the rectangle *i.e.* *B* and *C*.

66. (*d*) : The persons satisfying the given conditions are represented by regions which lie inside the bigger triangle but outside the smaller triangle and the circle *i.e.* *L* and *H*.

67. (*b*) : The person satisfying the given conditions is represented by the region common to the rectangle, circle and the smaller triangle *i.e.* *F*.

68. (*d*) **69.** (*b*) **70.** (*c*)

71. (*d*) **72.** (*c*) **73.** (*c*) **74.** (*b*) **75.** (*d*)

10. ALPHABET TEST

TYPE 1 : ALPHABETICAL ORDER OF WORDS

In this type of questions, certain words are given. The candidate is required to arrange them in the order in which they shall be arranged in a dictionary and then state the word which is placed in the desired place.

For such questions, the candidate requires basic knowledge of the 'Dictionary Usage'. In a dictionary, the words are put in alphabetical order with respect to the second alphabet of the words and so on. A sample of the arrangement of words in a dictionary is given below :

absurd	account	balcony	cable
abundance	adage	ballot	cactus
abuse	.....	beach	cafe
abut	babble	beak	cajole
acacia	babe	beam	caldron
acadian	bachelor	bigot	calligraphy
accede	back	bilingual	camel
accelerate	badge	.....	canon
access	balance	cab	.....

How to Arrange the Words in Alphabetical Order ?

First consider the first letter of each word. Arrange the words in the order in which these letters appear in the English alphabet.

Example : Consider the words :

Apparent, Torture, Payment, Fossil, Shark.

These words begin with letters A, T, P, F, S respectively. Their order in English alphabet is A, F, P, S, T.

So, the correct alphabetical order is :

Apparent, Fossil, Payment, Shark, Torture.

In some cases, two or more words may begin with the same letter. Such words should be arranged in the order of second letters in the alphabet.

Example : Consider the words :

Client, Castle, Face, Viper, Dazzle.

Here, as in the above example, the words can be arranged as :

$\left.\begin{matrix}\text{Client}\\ \text{Castle}\end{matrix}\right\}$, Dazzle, Face, Viper.

What remains now is how to arrange 'Client' and 'Castle'.

Consider the second letters *i.e.*, *l* and *a*.

Arranging these words accordingly, 'Castle' comes before 'Client'.

Thus, the correct alphabetical order is :

Castle, Client, Dazzle, Face, Viper.

If both the first and second letters of two or more words are the same, arrange these words, considering their third letters and so on.

ILLUSTRATIVE EXAMPLES

Ex. 1. Arrange the given words in alphabetical order and tick the one that comes first.
(*a*) Cloud (*b*) Middle (*c*) Grunt (*d*) Mob (*e*) Chain

Sol. These words can be properly arranged as :
Chain, Cloud, Grunt, Middle, Mob
Clearly, the first word is 'Chain' and so, the correct answer is (*e*).

Ex. 2. Arrange the given words in alphabetical order and tick the one that comes in the middle.
(*a*) Rigour (*b*) Remove (*c*) Retrospect (*d*) Revive (*e*) Rumour

Sol. These words can be properly arranged as :
Remove, Retrospect, Revive, Rigour, Rumour
Clearly, the middle word is 'Revive' and so, the correct answer is (*d*).

Ex. 3. Arrange the given words in alphabetical order and tick the one that comes last.
(*a*) Abandon (*b*) Actuate (*c*) Accumulate (*d*) Acquit (*e*) Achieve

Sol. The given words can be arranged in alphabetical order as :
Abandon, Accumulate, Achieve, Acquit, Actuate
Clearly, 'Actuate' comes last and so, the answer is (*b*).

Ex. 4. Arrange the words in the alphabetical order and tick the one that comes second.
(*a*) Explosion (*b*) Emergency (*c*) Ecstasy (*d*) Eager (*e*) Entaemology

Sol. The given words can be arranged in the alphabetical order as :
Eager, Ecstasy, Emergency, Entaemology, Explosion
Clearly, 'Ecstasy' comes second. So, the answer is (*c*).

Ex. 5. Arrange the following words in the sequence in which they occur in dictionary :
1. Brook 2. Bandit 3. Boisterous 4. Baffle 5. Bright
(*a*) 4, 2, 3, 5, 1 (*b*) 2, 4, 3, 1, 5 (*c*) 2, 4, 3, 5, 1 (*d*) 4, 2, 3, 1, 5

Sol. Clearly, the correct alphabetical order of the given words is :
Baffle, Bandit, Boisterous, Bright, Brook
Thus, the correct sequence is 4, 2, 3, 5, 1. Hence, the answer is (*a*).

Ex. 6. In a telephone directory, which of the following names will appear in the middle ? **(Bank P.O. 1993)**
(*a*) Sajewat (*b*) Segvan (*c*) Sajevar (*d*) Sajewet (*e*) Salwar

Sol. The given names in the correct alphabetical order would be :
Sajevar, Sajewat, Sajewet, Salwar and Segvan.
Clearly, Sajewet appears in the middle. Hence, the answer is (*d*).

EXERCISE 10A

Directions : ***Arrange the given words in alphabetical order and choose the one that comes first.***

1.	(*a*) Wasp	(*b*) Waste	(*c*) War	(*d*) Wrinkle	(*e*) Wrist
2.	(*a*) Science	(*b*) Scrutiny	(*c*) Scripture	(*d*) Scramble	(*e*) Script
3.	(*a*) Intense	(*b*) Intellect	(*c*) Intend	(*d*) Intelligent	(*e*) Integument
4.	(*a*) Nature	(*b*) Native	(*c*) Narrate	(*d*) Nascent	(*e*) Naughty
5.	(*a*) Didactic	(*b*) Dictum	(*c*) Dictionary	(*d*) Diastole	(*e*) Dictate

6.	(*a*) Praise	(*b*) Practical	(*c*) Prank	(*d*) Prayer	(*e*) Practise
7.	(*a*) Animate	(*b*) Animosity	(*c*) Anguish	(*d*) Ankle	(*e*) Announce
8.	(*a*) Probe	(*b*) Proclaim	(*c*) Proceed	(*d*) Problem	(*e*) Probate
9.	(*a*) Guarantee	(*b*) Group	(*c*) Grotesque	(*d*) Guard	(*e*) Groan
10.	(*a*) Signature	(*b*) Sight	(*c*) Shrine	(*d*) Shrill	(*e*) Shrink
11.	(*a*) Qualify	(*b*) Quarter	(*c*) Quarrel	(*d*) Quarry	(*e*) Quaver
12.	(*a*) Length	(*b*) Lenient	(*c*) Legacy	(*d*) Legal	(*e*) Legible
13.	(*a*) Judiciary	(*b*) Jockey	(*c*) Javelin	(*d*) Jealous	(*e*) Jargon
14.	(*a*) Grind	(*b*) Growth	(*c*) Great	(*d*) Grease	(*e*) Greed
15.	(*a*) Blast	(*b*) Bottle	(*c*) Bondage	(*d*) Boisterous	(*e*) Bonafide
16.	(*a*) Tenacious	(*b*) Terminate	(*c*) Temperature	(*d*) Temple	(*e*) Tenant
17.	(*a*) Slander	(*b*) Skeleton	(*c*) Stimulate	(*d*) Similar	(*e*) Summary
18.	(*a*) Filter	(*b*) Homage	(*c*) Chastise	(*d*) Charge	(*e*) Certify
19.	(*a*) Exhilarate	(*b*) Ephemeral	(*c*) Entrench	(*d*) Enterprise	(*e*) Enthusiasm
20.	(*a*) Partition	(*b*) Passion	(*c*) Parlour	(*d*) Participate	(*e*) Particle
21.	(*a*) Heredity	(*b*) Hesitate	(*c*) Heavy	(*d*) Hedge	(*e*) Herald
22.	(*a*) Prominent	(*b*) Prohibit	(*c*) Promise	(*d*) Prolong	(*e*) Programme
23.	(*a*) Launch	(*b*) Laugh	(*c*) Lattice	(*d*) Latent	(*e*) Latitude
24.	(*a*) Conceive	(*b*) Diurnal	(*c*) Conceit	(*d*) Concentrate	(*e*) Custody
25.	(*a*) Language	(*b*) Laurel	(*c*) Leisure	(*d*) Lapse	(*e*) Leave
26.	(*a*) Necessary	(*b*) Nature	(*c*) Naval	(*d*) Navigate	(*e*) Nautical
27.	(*a*) Devise	(*b*) Dexterity	(*c*) Devour	(*d*) Dew	(*e*) Deuce
28.	(*a*) Foment	(*b*) Foetus	(*c*) Forceps	(*d*) Foreign	(*e*) Foliage
29.	(*a*) Sport	(*b*) Spouse	(*c*) Squash	(*d*) Sporadic	(*e*) Sprout
30.	(*a*) Grammar	(*b*) Granary	(*c*) Gradient	(*d*) Grand	(*e*) Granule

ANSWERS

The correct alphabetical order of the given words is shown below :

1. (*c*) : War, Wasp, Waste, Wrinkle, Wrist
2. (*a*) : Science, Scramble, Script, Scripture, Scrutiny
3. (*e*) : Integument, Intellect, Intelligent, Intend, Intense
4. (*c*) : Narrate, Nascent, Native, Nature, Naughty
5. (*d*) : Diastole, Dictate, Dictionary, Dictum, Didactic
6. (*b*) : Practical, Practise, Praise, Prank, Prayer
7. (*c*) : Anguish, Animate, Animosity, Ankle, Announce
8. (*e*) : Probate, Probe, Problem, Proceed, Proclaim
9. (*e*) : Groan, Grotesque, Group, Guarantee, Guard
10. (*d*) : Shrill, Shrine, Shrink, Sight, Signature
11. (*a*) : Qualify, Quarrel, Quarry, Quarter, Quaver
12. (*c*) : Legacy, Legal, Legible, Length, Lenient
13. (*e*) : Jargon, Javelin, Jealous, Jockey, Judiciary
14. (*d*) : Grease, Great, Greed, Grind, Growth
15. (*a*) : Blast, Boisterous, Bonafide, Bondage, Bottle
16. (*c*) : Temperature, Temple, Tenacious, Tenant, Terminate

17. (*d*) : Similar, Skeleton, Slander, Stimulate, Summary
18. (*e*) : Certify, Charge, Chastise, Filter, Homage
19. (*d*) : Enterprise, Enthusiasm, Entrench, Ephemeral, Exhilarate
20. (*c*) : Parlour, Participate, Particle, Partition, Passion
21. (*c*) : Heavy, Hedge, Herald, Heredity, Hesitate
22. (*e*) : Programme, Prohibit, Prolong, Prominent, Promise
23. (*d*) : Latent, Latitude, Lattice, Laugh, Launch
24. (*c*) : Conceit, Conceive, Concentrate, Custody, Diurnal
25. (*a*) : Language, Lapse, Laurel, Leave, Leisure
26. (*b*) : Nature, Nautical, Naval, Navigate, Necessary
27. (*e*) : Deuce, Devise, Devour, Dew, Dexterity
28. (*b*) : Foetus, Foliage, Foment, Forceps, Foreign
29. (*d*) : Sporadic, Sport, Spouse, Sprout, Squash
30. (*c*) : Gradient, Grammar, Granary, Grand, Granule

EXERCISE 10B

Directions : ***Arrange the given words in alphabetical order and tick the one that comes in the middle.***

1.	(*a*) Plane	(*b*) Plain	(*c*) Plenty	(*d*) Player	(*e*) Place **(Bank P.O. 1991)**
2.	(*a*) Reprimand	(*b*) Reverence	(*c*) Amazed	(*d*) Acquire	(*e*) Disturb
3.	(*a*) Parasite	(*b*) Party	(*c*) Petal	(*d*) Paste	(*e*) Prick
4.	(*a*) Sound	(*b*) Socks	(*c*) Shock	(*d*) Snooker	(*e*) Sharp
5.	(*a*) Heaven	(*b*) Hillock	(*c*) Hawker	(*d*) Hilt	(*e*) History
6.	(*a*) Catastrophe	(*b*) Canvass	(*c*) Crisp	(*d*) Charcoal	(*e*) Character
7.	(*a*) Robber	(*b*) Rocket	(*c*) Random	(*d*) Restaurant	(*e*) Restrict
8.	(*a*) Outrage	(*b*) Outcast	(*c*) Overture	(*d*) Overtake	(*e*) Ovary
9.	(*a*) Delude	(*b*) Delirium	(*c*) Defer	(*d*) Demean	(*e*) Delete **(L.I.C. 1994)**
10.	(*a*) Transform	(*b*) Transport	(*c*) Transplant	(*d*) Transfer	(*e*) Trickery
11.	(*a*) Section	(*b*) Septic	(*c*) Seclude	(*d*) Secure	(*e*) Sentiment
12.	(*a*) Verrigate	(*b*) Vibrate	(*c*) Vindictive	(*d*) Trench	(*e*) Wavering
13.	(*a*) Leprosy	(*b*) Lessen	(*c*) Lesson	(*d*) Language	(*e*) Languid
14.	(*a*) Assistant	(*b*) Assessment	(*c*) Asbestos	(*d*) Asterick	(*e*) Ass
15.	(*a*) Firmament	(*b*) Finish	(*c*) First	(*d*) Fissure	(*e*) Fiscal
16.	(*a*) Bishop	(*b*) Bifocal	(*c*) Bicycle	(*d*) Bitter	(*e*) Brink
17.	(*a*) Cathedral	(*b*) Catenation	(*c*) Abacus	(*d*) Category	(*e*) Catalogue
18.	(*a*) Amphibian		(*b*) Amorphous		(*c*) Amphidextrous **(NABARD, 1994)**
	(*d*) Ambiguous		(*e*) Ambivalent		
19.	(*a*) Haste	(*b*) Haphazard	(*c*) Host	(*d*) Hang	(*e*) Handkerchief
20.	(*a*) Nozzle	(*b*) Nausea	(*c*) Nostril	(*d*) Nomenclature	(*e*) Normal
21.	(*a*) Entry	(*b*) Efflorescent	(*c*) Entreat	(*d*) Ensure	(*e*) Every

22.	(*a*) Signature	(*b*) Significance	(*c*) Sight	(*d*) Sigh	(*e*) Sieve
23.	(*a*) Alive	(*b*) Afforest	(*c*) Anticipate	(*d*) Appreciate	(*e*) Achieve
24.	(*a*) Tennis	(*b*) Tendon	(*c*) Tender	(*d*) Tempest	(*e*) Terminal
25.	(*a*) Radical	(*b*) Radiate	(*c*) Racket	(*d*) Radius	(*e*) Radar
26.	(*a*) Slaughter	(*b*) Skirt	(*c*) Straight	(*d*) Shout	(*e*) Specify
27.	(*a*) Yield	(*b*) Zygote	(*c*) Yearn	(*d*) Wrought	(*e*) Wrong
28.	(*a*) People	(*b*) Penitent	(*c*) Pepsin	(*d*) Penury	(*e*) Penalty
29.	(*a*) Hobby	(*b*) Holiday	(*c*) Hoarse	(*d*) Hollow	(*e*) Hobble
30.	(*a*) Apology	(*b*) Branch	(*c*) Antigen	(*d*) Antique	(*e*) Antipathy

ANSWERS

The correct alphabetical order of the given words is shown below :

1. (*a*) : Place, Plain, Plane, Player, Plenty
2. (*e*) : Acquire, Amazed, Disturb, Reprimand, Reverence
3. (*d*) : Parasite, Party, Paste, Petal, Prick
4. (*d*) : Sharp, Shock, Snooker, Socks, Sound
5. (*b*) : Hawker, Heaven, Hillock, Hilt, History
6. (*e*) : Canvass, Catastrophe, Character, Charcoal, Crisp
7. (*e*) : Random, Restaurant, Restrict, Robber, Rocket
8. (*e*) : Outcast, Outrage, Ovary, Overtake, Overture
9. (*b*) : Defer, Delete, Delirium, Delude, Demean
10. (*c*) : Transfer, Transform, Transplant, Transport, Trickery
11. (*d*) : Seclude, Section, Secure, Sentiment, Septic
12. (*b*) : Trench, Verrigate, Vibrate, Vindictive, Wavering
13. (*a*) : Language, Languid, Leprosy, Lessen, Lesson
14. (*b*) : Asbestos, Ass, Assessment, Assistant, Asterick
15. (*c*) : Finish, Firmament, First, Fiscal, Fissure
16. (*a*) : Bicycle, Bifocal, Bishop, Bitter, Brink
17. (*d*) : Catalogue, Catchment, Category, Catenation, Cathedral
18. (*b*) : Ambiguous, Ambivalent, Amorphous, Amphibian, Amphidextrous
19. (*b*) : Handkerchief, Hang, Haphazard, Haste, Host
20. (*e*) : Nausea, Nomenclature, Normal, Nostril, Nozzle
21. (*c*) : Efflorescent, Ensure, Entreat, Entry, Every
22. (*c*) : Sieve, Sigh, Sight, Signature, Significance
23. (*a*) : Achieve, Afforest, Alive, Anticipate, Appreciate
24. (*b*) : Tempest, Tender, Tendon, Tennis, Terminal
25. (*b*) : Racket, Radar, Radiate, Radical, Radius
26. (*a*) : Shout, Skirt, Slaughter, Specify, Straight
27. (*c*) : Wrong, Wrought, Yearn, Yield, Zygote
28. (*d*) : Penalty, Penitent, Penury, People, Pepsin
29. (*a*) : Hoarse, Hobble, Hobby, Holiday, Hollow
30. (*d*) : Antigen, Antipathy, Antique, Apology, Branch

EXERCISE 10C

Directions : ***Arrange the given words in alphabetical order and tick the one that comes at the second place.***

1.	(*a*) Scissors	(*b*) Scorpion	(*c*) Schedule	(*d*) Semester	(*e*) Sensitive
2.	(*a*) Livestock	(*b*) Litter	(*c*) Literary	(*d*) Little	(*e*) Livelihood
3.	(*a*) Manifest	(*b*) Meticulous	(*c*) Meridian	(*d*) Merchant	(*e*) Mercerise
4.	(*a*) Interview	(*b*) Invent	(*c*) Intestine	(*d*) Interlude	(*e*) Interfere
5.	(*a*) Converse	(*b*) Current	(*c*) Curator	(*d*) Cutaneous	(*e*) Cushion
6.	(*a*) Stipend	(*b*) Stagger	(*c*) Stabilise	(*d*) Stimulus	(*e*) Sterile
7.	(*a*) Dialogue	(*b*) Diabolic	(*c*) Diagonal	(*d*) Diaphragm	(*e*) Dialect
8.	(*a*) Mink	(*b*) Multiple	(*c*) Murder	(*d*) Multitude	(*e*) Music
9.	(*a*) Express	(*b*) Extend	(*c*) Expire	(*d*) Explode	(*e*) Expand
10.	(*a*) Revenue	(*b*) Remind	(*c*) Relish	(*d*) Remark	(*e*) Remorse
11.	(*a*) Gourd	(*b*) Gesture	(*c*) Gentle	(*d*) Genuine	(*e*) Generous
12.	(*a*) Rural	(*b*) Romance	(*c*) Rejoice	(*d*) Reveal	(*e*) Retain
13.	(*a*) Shrub	(*b*) Shudder	(*c*) Shroud	(*d*) Shuffle	(*e*) Shuttle
14.	(*a*) Fault	(*b*) Fantasy	(*c*) Finger	(*d*) Fascinate	(*e*) Fanaticism
15.	(*a*) Niger	(*b*) Narcotic	(*c*) Ninth	(*d*) Nemises	(*e*) Never

Directions : ***Arrange the given words in the alphabetical order and tick the one that comes last.***

16.	(*a*) Regard	(*b*) Refer	(*c*) Remind	(*d*) Report	(*e*) Render
17.	(*a*) Demand	(*b*) Destroy	(*c*) Deterred	(*d*) Direct	(*e*) Damage
18.	(*a*) Finger	(*b*) Flourish	(*c*) Formal	(*d*) Forget	(*e*) Forgo
19.	(*a*) Cover	(*b*) Collect	(*c*) Caught	(*d*) Callous	(*e*) Career
20.	(*a*) Window	(*b*) Marriage	(*c*) Widow	(*d*) Distress	(*e*) Matrimonial
21.	(*a*) Mother	(*b*) Monitor	(*c*) Monkey	(*d*) Master	(*e*) Matter
22.	(*a*) Language	(*b*) Litter	(*c*) Lieutenant	(*d*) Luggage	(*e*) Landlord
23.	(*a*) Separate	(*b*) Settle	(*c*) Suggest	(*d*) Satisfaction	(*e*) Sundry
24.	(*a*) Afford	(*b*) Avoid	(*c*) Answer	(*d*) Awesome	(*e*) After
25.	(*a*) Eventual	(*b*) Extra	(*c*) Entrance	(*d*) Exterminate	(*e*) Emancipate
26.	(*a*) Perpetual	(*b*) Parachute	(*c*) Paragraph	(*d*) Pursue	(*e*) Programme
27.	(*a*) Pillow	(*b*) Institution	(*c*) Examination	(*d*) Inference	(*e*) Derive
28.	(*a*) Determination	(*b*) Destitute	(*c*) Detergent	(*d*) Definite	(*e*) Distance
29.	(*a*) Television	(*b*) Truant	(*c*) Twist	(*d*) Tension	(*e*) Teletext
30.	(*a*) Hamper	(*b*) Hesitate	(*c*) Hectic	(*d*) Hunter	(*e*) Hollow

ANSWERS

The correct alphabetical order of the given words is shown below :

1. (*a*) : Schedule, Scissors, Scorpion, Semester, Sensitive

2. (*b*) : Literary, Litter, Little, Livelihood, Livestock

3. (*e*) : Manifest, Mercerise, Merchant, Meridian, Meticulous

4. (*d*) : Interfere, Interlude, Intestine, Interview, Invent

5. (*c*) : Converse, Curator, Current, Cushion, Cutaneous
6. (*b*) : Stabilise, Stagger, Sterile, Stimulus, Stipend
7. (*c*) : Diabolic, Diagonal, Dialect, Dialogue, Diaphragm
8. (*b*) : Mink, Multiple, Multitude, Murder, Music
9. (*c*) : Expand, Expire, Explode, Express, Extend
10. (*d*) : Relish, Remark, Remind, Remorse, Revenue
11. (*c*) : Generous, Gentle, Genuine, Gesture, Gourd
12. (*e*) : Rejoice, Retain, Reveal, Romance, Rural
13. (*a*) : Shroud, Shrub, Shudder, Shuffle, Shuttle
14. (*b*) : Fanaticism, Fantasy, Fascinate, Fault, Finger
15. (*d*) : Narcotic, Nemises, Never, Niger, Ninth
16. (*d*) : Refer, Regard, Remind, Render, Report
17. (*d*) : Damage, Demand, Destroy, Deterred, Direct
18. (*c*) : Finger, Flourish, Forget, Forgo, Formal
19. (*a*) : Callous, Career, Caught, Collect, Cover
20. (*a*) : Distress, Marriage, Matrimonial, Widow, Window
21. (*a*) : Master, Matter, Monitor, Monkey, Mother
22. (*d*) : Landlord, Language, Lieutenant, Litter, Luggage
23. (*e*) : Satisfaction, Separate, Settle, Suggest, Sundry
24. (*d*) : Afford, After, Answer, Avoid, Awesome
25. (*b*) : Emancipate, Entrance, Eventual, Exterminate, Extra
26. (*d*) : Parachute, Paragraph, Perpetual, Programme, Pursue
27. (*a*) : Derive, Examination, Inference, Institution, Pillow
28. (*e*) : Definite, Destitute, Detergent, Determination, Distance
29. (*c*) : Teletext, Television, Tension, Truant, Twist
30. (*d*) : Hamper, Hectic, Hesitate, Hollow, Hunter

EXERCISE 10D

Directions : ***In each of the following questions, arrange the given words in the sequence in which they occur in the dictionary and then choose the correct sequence.***

1. 1. Preach 2. Praise 3. Precinct 4. Precept 5. Precede
(*a*) 2, 1, 5, 4, 3 (*b*) 2, 1, 3, 4, 5 (*c*) 2, 5, 1, 4, 3 (*d*) 1, 2, 5, 4, 3

2. 1. Select 2. Seldom 3. Send 4. Selfish 5. Seller
(*a*) 1, 2, 4, 5, 3 (*b*) 2, 1, 5, 4, 3 (*c*) 2, 1, 4, 5, 3 (*d*) 2, 5, 4, 1, 3
(U.D.C. 1995)

3. 1. Wrinkle 2. Wriggle 3. Writhe 4. Wretch 5. Wrath
(*a*) 4, 5, 1, 2, 3 (*b*) 5, 4. 2, 1, 3 (*c*) 4, 2, 5, 1, 3 (*d*) 5, 2, 1, 3, 4

4. 1. Spruce 2. Spume 3. Spree 4. Spurt 5. Sprawl
(*a*) 5, 3, 1, 2, 4 (*b*) 1, 2, 3, 4, 5 (*c*) 3, 5, 1, 4, 2 (*d*) 5, 4, 3, 2, 1

5. 1. Credential 2. Creed 3. Crease 4. Cremate 5. Credible
(*a*) 1, 2, 3, 4, 5 (*b*) 1, 5, 3, 4, 2 (*c*) 5, 1, 2, 3, 4 (*d*) 3, 1, 5, 2 4

6. 1. Intrinsic 2. Intrude 3. Intricate
4. Introvert 5. Intrigue 6. Introduce
(*a*) 3, 5, 1, 4, 6, 2 (*b*) 3, 5, 1, 6, 4, 2 (*c*) 3, 1, 5, 4, 6, 2 (*d*) 5, 1, 3, 2, 4, 6

7. 1. Liver 2. Long 3. Late
4. Load 5. Luminous 6. Letter **(U.D.C. 1995)**
(*a*) 3, 1, 6, 2, 4, 5 (*b*) 3, 1, 6, 2, 5, 4 (*c*) 3, 6, 1, 2, 4, 5 (*d*) 3, 6, 1, 4, 2, 5

8. 1. Dissipate 2. Dissuade 3. Disseminate
4. Distract 5. Dissociate 6. Dissect
(*a*) 6, 3, 1, 5, 2, 4 (*b*) 1, 6, 3, 2, 4, 5 (*c*) 3, 6, 1, 2, 5, 4 (*d*) 4, 6, 3, 1, 5, 2

9. 1. Page 2. Pagan 3. Palisade 4. Pageant 5. Palate
(*a*) 1, 4, 2, 3, 5 (*b*) 2, 4, 1, 3, 5 (*c*) 2, 1, 4, 5, 3 (*d*) 1, 4, 2, 5, 3

10. 1. Pestle 2. Pestilence 3. Pester 4. Pest 5. Pessimist
(*a*) 5, 4, 3, 2, 1 (*b*) 4, 3, 1, 5, 2 (*c*) 3, 4, 2, 5, 1 (*d*) 4, 5, 1, 2, 3

11. If the first five words in the sentence, "Meeta's mother meets me many times" are rearranged in the alphabetical order, which will be the middle word ?
(*a*) Meeta (*b*) mother (*c*) meets (*d*) me (*e*) many **(B.S.R.B. 1996)**

12. If the words in the sentence, "She showed several sample snaps" are rearranged in the alphabetical order, which will be the middle word ?
(*a*) snaps (*b*) sample (*c*) several (*d*) showed (*e*) she

Directions : ***In each of the following questions, arrange the given names in the order in which they would occur in a telephone directory and choose the one which appears in the middle.***

13. (*a*) Avdesh (*b*) Avadhesh (*c*) Awadesh (*d*) Awdhesh (*e*) Awadhesh

14. (*a*) Randhir (*b*) Randesh (*c*) Rama (*d*) Raamesh (*e*) Renmurthi **(S.B.I.P.O. 1994)**

15. (*a*) Bhagat (*b*) Bhagwat (*c*) Bhagvati (*d*) Bhagirath (*e*) Bhagvant

16. (*a*) Mohammad (*b*) Mohammed (*c*) Muhammad
(*d*) Muhammed (*e*) Mohummad

17. (*a*) Jetley (*b*) Jenson (*c*) Jainson (*d*) Jaina (*e*) Jaisons

18. (*a*) Krishanmurty (*b*) Krishnamurthy (*c*) Krishnmurthi
(*d*) Krishanmurthy (*e*) Krishnamurti

19. (*a*) Mahender (*b*) Mahendra (*c*) Mahinder (*d*) Mahindra (*e*) Mohinder

20. (*a*) Subramaniam (*b*) Subramanyam (*c*) Subhramaniam
(*d*) Subhrmanyam (*e*) Subramniam

ANSWERS

1. (*a*) **2.** (*c*) **3.** (*b*) **4.** (*a*) **5.** (*d*) **6.** (*b*) **7.** (*d*) **8.** (*a*) **9.** (*c*) **10.** (*a*)

11. (*a*) : The correct order is : many, me, Meeta, meets, mother

12. (*e*) : The alphabetical order is : sample, several, she, showed, snaps

13. (*c*) : The alphabetical order is : Avadhesh, Avdesh, Awadesh, Awadhesh, Awdhesh

14. (*b*) : The alphabetical order is : Raamesh, Rama, Randesh, Randhir, Renmurthi

15. (*e*) : The alphabetical order is : Bhagat, Bhagirath, Bhagvant, Bhagvati, Bhagwat

16. (*e*) : The alphabetical order is : Mohammad, Mohammed, Mohummad, Muhammad, Muhammed

17. (*e*) : The alphabetical order is : Jaina, Jainson, Jaisons, Jenson, Jetley

18. (*b*) : The alphabetical order is : Krishanmurthy, Krishanmurty, Krishnamurthy, Krishnamurti, Krishnmurthi

19. (*c*) : The alphabetical order is : Mahender, Mahendra, Mahinder, Mahindra, Mohinder

20. (*a*) : The alphabetical order is : Subhramaniam, Subhrmanyam, Subramaniam, Subramanyam, Subramniam

TYPE-2 : LETTER-WORD PROBLEMS

Ex. 1. How many pairs of letters are there in the word NECESSARY which have as many letters between them in the word as there are between them in the alphabet and in the same order ?

(*a*) One (*b*) Two (*c*) Three (*d*) Nil (*e*) Four

Sol. Clearly, such a letter pair is N and S. In the word NECESSARY, they have four letters between them — E, C, E and S.

In the alphabet too, N and S have four letters between them — O, P, Q and R. Hence, the answer is (*a*).

Ex. 2. If the first and third letters in the word NECESSARY were interchanged, also the fourth and the sixth letters, and the seventh and the ninth letters which of the following would be the seventh letter from the left ?

(*a*) A (*b*) Y (*c*) R (*d*) E (*e*) S

Sol. We interchange the positions of the letters as shown below :

The new letter sequence is CENSSEYRA.

Clearly, the seventh letter from the left is Y. Hence, the answer is (*b*).

EXERCISE 10E

1. How many pairs of letter are there in the word 'BUCKET' which have as many letters between them in the word as in the alphabet ? **(S.B.I.P.O. 1994)**

(*a*) One (*b*) Two (*c*) Three (*d*) Four (*e*) More than four

2. Two letters in the word 'PRESENCE' have as many letters between them in the word as in the alphabet and in the same order. Which one of the two letters comes earlier in the alphabet ?

(*a*) C (*b*) E (*c*) R (*d*) P (*e*) None of these

Hint : Do not count the pair EC, because as mentioned in the question, the letters should be in the same order in which they occur in the alphabet.

3. How many letters are there in the word 'CREATIVE' which have as many letters between them in the word as in the alphabet ? **(S.B.I.P.O. 1997)**

(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4 (*e*) None of these

4. In the word 'PARADISE', how many pairs of letters are there which have as many letters between them in the word as in the alphabet ?

(*a*) None (*b*) One (*c*) Two (*d*) Three (*e*) Four

5. How many pairs of letters in the word 'DABBLE' have as many letters between them in the word as in the alphabet ? **(Bank P.O. 1996)**

(*a*) Nil (*b*) One (*c*) Two (*d*) Three (*e*) More than three

6. How many pairs of letters are there in the word 'HORIZON' which have as many letters between them in the word as in the English alphabet ?

(*a*) One (*b*) Two (*c*) Three (*d*) More than three

7. How many pairs of letters are there in the word 'DONATE' which have as many letters between them as there are in the alphabet ? **(Bank P.O. 1995)**
(*a*) Nil (*b*) One (*c*) Two (*d*) Three (*e*) None of these

8. How many pairs of letters in the word 'CHAIRS' have as many letters between them in the word as in the alphabet ?
(*a*) None (*b*) One (*c*) Two (*d*) Three (*e*) Four

9. Two letters in the word 'LEMON' have as many letters between them in the word as in the alphabet. Which one of the two letters comes earlier in the alphabet ?
(*a*) E (*b*) L (*c*) M (*d*) N (*e*) O

10. How many pairs of letters are there in the word 'CLANGOUR' which have as many letters between them in the word as in the alphabet ? **(Bank P.O. 1996)**
(*a*) One (*b*) Two (*c*) Three (*d*) Four (*e*) None of these

11. How many pairs of letters are there in the word 'LANGUISH' which have as many letters between them in the word as in the alphabet ?
(*a*) Nil (*b*) One (*c*) Two (*d*) Three (*e*) None of these

12. How many pairs of letters are there in the word 'PENCIL' which have as many letters between them in the word as in the alphabet ? **(Bank P.O. 1991)**
(*a*) Nil (*b*) One (*c*) Two (*d*) Three (*e*) None of these

13. How many pairs of letters in the word 'BRIGHTER' have as many letters between them in the word as in the alphabet ?
(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4 (*e*) More than 4

14. How many pairs of letters are there in the word 'CARROT' which have as many letters between them in the word as in the alphabet ? **(Bank P.O. 1993)**
(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4 (*e*) More than 4

15. How many pairs of letters in the word 'CATASTROPHE' have as many letters between them in the word as in the alphabet ?
(*a*) One (*b*) Two (*c*) Three (*d*) Four (*e*) None of these

16. How many pairs of letters are there in the word 'SEQUENTIAL' which have as many letters between them as are in the alphabet ? **(S.B.I.P.O. 1995)**
(*a*) Nil (*b*) One (*c*) Two (*d*) Three (*e*) Four

17. How many pairs of letters are there in the word 'REPURCUSSION' which have as many letters between them in the word as in the alphabet and that too in the same order ?
(*a*) Nil (*b*) One (*c*) Two (*d*) Three (*e*) None of these
Hint : Do not consider the pairs 'US' and 'ON'.

18. How many pairs of letters are there in the word 'PRESENTMENT' which have as many letters between them in the word as in the alphabet ?
(*a*) Nil (*b*) One (*c*) Two (*d*) Three (*e*) None of these

19. How many pairs of letters are there in the word 'ADEQUATELY' which have as many letters between them in the word as in the alphabet ? **(Bank P.O. 1991)**
(*a*) One (*b*) Two (*c*) Three (*d*) Four (*e*) More than four

20. If any two letters in the word 'PRISON' have as many letters between them in the word as there are in the English alphabet, they form an alpha-pair. How many such alpha-pairs are there in the word 'PRISON' ? **(NABARD, 1994)**
(*a*) Nil (*b*) 1 (*c*) 2 (*d*) 3 (*e*) More than 3

21. How many independent words can 'HEARTLESS' be divided into without changing the order of the letters and using each letter only once ? **(R.B.I. 1990)**
(*a*) 2 (*b*) 3 (*c*) 4 (*d*) 5 (*e*) Can't be so divided

22. How many independent words can 'STAINLESS' be divided into without changing the order of the letters and using each letter only once ?
(*a*) Nil (*b*) One (*c*) Two (*d*) Three (*e*) None of these

23. From the word 'ASTOUNDER', how many independent words can be made without changing the order of the letters and using each letter only once ?
(*a*) Nil (*b*) One (*c*) Two (*d*) Three (*e*) Four
(S.B.I.P.O. 1991)

24. From the word 'BEHIND', how many independent words can be made without changing the order of the letters and using each letter only once ?
(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4

25. From the word 'LAPAROSCOPY', how many independent meaningful words can be made without changing the order of the letters and using each letter only once ? **(L.I.C. 1994)**
(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4 (*e*) More than 4

26. How many independent words can 'DETERMINATION' be divided into without changing the order of the letters and using each letter only once ?
(*a*) One (*b*) Two (*c*) Three (*d*) Four (*e*) None of these

27. Which letter in the word 'SELFRIGHTEOUSNESS' does not change its position when the letters are reversed ? **(Hotel Management, 1996)**
(*a*) E (*b*) G (*c*) H (*d*) T

28. If the first and second letters in the word 'DEPRESSION' were interchanged, also the third and the fourth letters, the fifth and the sixth letters and so on, which of the following would be the seventh letter from the right ?
(*a*) R (*b*) O (*c*) S (*d*) I (*e*) None of these

29. If the positions of the first and sixth letters of the word 'BENEFICIAL' are interchanged; similarly the positions of the second and seventh letters are interchanged and so on, which letter will be third from the right end after rearrangement ?
(*a*) C (*b*) E (*c*) F (*d*) N (*e*) None of these
(Bank P.O. 1992)

30. If the first and second letters in the word 'MISFORTUNE' were interchanged, also the third and the fourth letters, the fifth and the sixth letters and so on, which letter would then be the eighth letter counting to your left ?
(*a*) O (*b*) F (*c*) S (*d*) T (*e*) U

31. Which letter will be the fifth from the right if the first and the second, the third and the fourth and so on are interchanged in the word 'COMPANIONATE' ?
(*a*) A (*b*) I (*c*) N (*d*) O (*e*) None of these
(Bank P.O. 1996)

32. If the last four letters of the word 'CONCENTRATION' are written in reverse order followed by next two in the reverse order and next three in the reverse order and then followed by the first four in the reverse order, counting from the end, which letter would be eighth in the new arrangement ?
(*a*) N (*b*) T (*c*) E (*d*) R
(I. Tax & Central Excise, 1989)

33. If the positions of the first and the sixth letters in the word 'DISTRIBUTE' are interchanged; similarly the positions of the second and the seventh, the third and the eighth and so on, which of the following letters will be the fifth from left after interchanging the positions ? **(Bank P.O. 1995)**

(*a*) E (*b*) I (*c*) S (*d*) T (*e*) None of these

34. If the positions of the third and tenth letters of the word 'DOCUMENTATION' are interchanged, and likewise the position of the fourth and seventh letters, the second and sixth letters, is also interchanged, which of the following will be eleventh letter from the right end ?

(*a*) C (*b*) I (*c*) T (*d*) U (*e*) None of these

35. If in the word 'DISTURBANCE', the first letter is interchanged with the last letter, the second letter is interchanged with the tenth letter and so on, which letter would come after the letter 'T' in the newly formed word ? **(L.I.C. 1994)**

(*a*) I (*b*) N (*c*) S (*d*) T (*e*) U

36. If the positions of the fifth and twelfth letters of the word 'GLORIFICATIONS' are interchanged; and likewise the position of the fourth and fourteenth letters, the third and tenth letters, the second and eleventh letters and the first and thirteenth letters are interchanged, which of the following will be twelfth letter from the right end ? **(U.T.I. 1993)**

(*a*) I (*b*) O (*c*) R (*d*) T (*e*) None of these

ANSWERS

	Letters in the word	Letters in the alphabet
1. (*a*) :	C K E	C D E
2. (*d*) :	P R E S	P Q R S
3. (*c*) :	C R E	C D E
	A T I V E	A B C D E
	T I V	T U V
4. (*c*) :	P A R	P Q R
	A R A D	A B C D
5. (*e*) :	D A B	D C B
	B B L E	B C D E
	A B	A B
	A B B L E	A B C D E
6. (*b*) :	R I Z Q	R Q P Q
	Q N	Q N
7. (*c*) :	D O N A	D C B A
	Q N	Q N
8. (*c*) :	C H A	C B A
	R S	R S
9. (*b*) :	L E M Q	L M N Q
10. (*e*) :	C L A	C B A
	C L A N G	C D E F G
	L A N	L M N
	L A N G O U R	L M N O P Q R
	N G O U R	N O P Q R

	Letters in the word	Letters in the alphabet
11. (*c*) :	L A N	L M N
	U I S	U T S
12. (*c*) :	P E N	P O N
	E N C	E D C
13. (*c*) :	I G H T E	I H G F E
	G H	G H
	T E R	T S R
14. (*a*) :	R O T	R S T
15. (*c*) :	S T	S T
	R O P	R Q P
	Q P	Q P
16. (*e*) :	S E Q	S R Q
	Q U E N	Q P O N
	S E Q U E N	S R Q P O N
	E N T I A	E D C B A
17. (*b*) :	P U R	P Q R
18. (*c*) :	P R E S	P Q R S
	R E S E N	R Q P O N
19. (*c*) :	D E	D E
	Q U A T	Q R S T
	Q U A T E L	Q P O N M L
20. (*e*) :	P R I S	P Q R S
	R I S Q	R Q P Q
	R I S O N	R Q P O N
	Q N	Q N

21. (*b*) : The words are HE, ART and LESS.

22. (*c*) : The words are STAIN and LESS.

23. (*c*) : The words formed are AT and UNDER; or AS and UNDER; or AT and SOUND.

24. (*b*) : The words are BE and HIND.

25. (*b*) : The words are LAP and COPY.

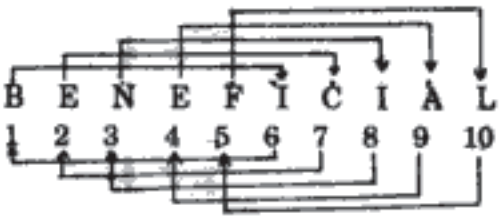
26. (*b*) : The words are DETER and NATION; or TERM and NATION; or DE and TERMINATION.

27. (*d*) : Clearly, when the letters of a word are written in reverse order, the position of the middle letter remains unchanged. Thus, in the word 'SELFRIGHTEOUSNESS', the middle letter *i.e.* T does not change its position when the letters are reversed.

28. (*e*) :

The new letter sequence is EDRPSEISNO.
The seventh letter from the right is P.

29. (*d*) :



The new letter sequence is ICIALBENEF.
The third letter from the right is N.

30. (*c*) :

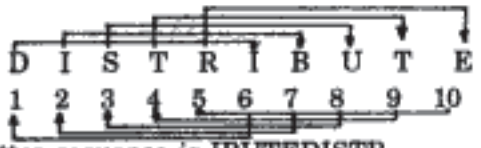
The new letter sequence is IMFSROUTEN.
The eighth letter counting towards left is S.

31. (*b*) :

The new letter sequence is OCPMNAOIANET.
The fifth letter from the right is I.

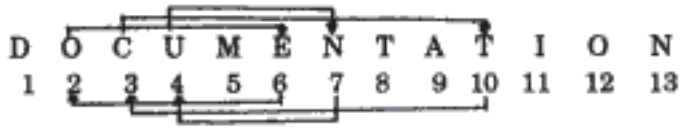
32. (*d*) : The new letter sequence is NOITARTNECNOC.
The eight letter from the end is R.

33. (*a*) :



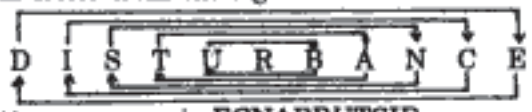
The new letter sequence is IBUTEDISTR.
The fifth letter from the left is E.

34. (*c*) :



The new letter sequence is DETNMOUTACION.
The eleventh letter from the right is T.

35. (*c*) :



The new letter sequence is ECNABRUTSID.
Clearly, S comes after T.

36. (*d*) :

The new letter sequence is NITSOFICAOLIGR.
The twelfth letter from the right is T.

TYPE 3 : RULE-DETECTION

Ex. Number of letters skipped in between adjacent letters in the series increases by one. Which of the following series observes the rule given above ?

(U.D.C. 1995)

(*a*) ACFJO (*b*) AEIMQ (*c*) DINSX (*d*) EHKNQ

Sol. We may analyse the given letter series as follows :

(*a*) A B C D E F G H I J K L M N O
1 2 3 4
+ 1 + 1 + 1

(*b*) A B C D E F G H I J K L M N O P Q
3 3 3 3
+0 +0 +0

(*c*) D E F G H I J K L M N O P Q R S T U V W X
4 4 4 4
+0 +0 +0

(*d*) E F G H I J K L M N O P Q
2 2 2 2
+0 +0 +0

Clearly, in letter-series ACFJO, the number of letters skipped in between adjacent letters increases by one as shown above. Hence, the answer is (*a*).

EXERCISE 10F

1. Number of letters skipped in between adjacent letters in the series is two. Which of the following series observes this rule ? **(U.D.C. 1995)**
(*a*) MPSVYBE (*b*) QSVYZCF (*c*) SVZCGJN (*d*) ZCGKMPR
2. Number of letters skipped in between adjacent letters in the series is odd. Which of the following series observes this rule ?
(*a*) BDHLR (*b*) FIMRX (*c*) EIMQV (*d*) MPRUX
3. The letters skipped in between the adjacent letters in the series are followed by equal space. Which of the following series observes this rule ?
(*a*) HKNGSW (*b*) RVZDFG (*c*) RVZDHL (*d*) SUXADF
(I. Tax & Central Excise, 1995)
4. Number of letters skipped in between the adjacent letters in the series are consecutive even numbers. Which of the following series observes this rule ?
(*a*) CDFIM (*b*) ADIPY (*c*) GIMSZ (*d*) DFJPX
5. Number of letters skipped in between adjacent letters in the series increases by one. Which of the following series observes this rule ? **(Assistant Grade, 1994)**
(*a*) CPTOV (*b*) HCFKP (*c*) HJHQV (*d*) IKNRW
6. Number of letters skipped in between adjacent letters in the series are increased by one. Which of the following alternatives observes this rule ?
(*a*) KMPTY (*b*) IJKOT (*c*) HJMQT (*d*) DFIJK
(I. Tax & Central Excise, 1996)
7. Number of letters skipped in between adjacent letters of the series starting from behind are increased by one. Which of the following series observes this rule ?
(*a*) OIGDC (*b*) OMJFA (*c*) OMKIG (*d*) ONLKJ
8. Which of the following series observes the rule, "Skip in between adjacent letters, increasing one letter more each time to build a set of letters" ?
(*a*) ACFJLQ (*b*) BDGKPV (*c*) CEHLQV (*d*) HILPUZ
(Assistant Grade, 1996)
9. Number of letters skipped in between adjacent letters in the series decreases by one. Which of the following series is observing the rule ? **(U.D.C. 1995)**
(*a*) BGKNPR (*b*) CINRTU (*c*) EJNQST (*d*) LQUXAP
10. Number of letters skipped in between adjacent letters in the series is two. Which one of the following alternatives observes this rule ? **(U.D.C. 1996)**
(*a*) SPMLI (*b*) TSPNKH (*c*) UROLIF (*d*) WTQNKJ

11. Number of letters skipped in between adjacent letters in the series decreases by two. Which of the following series observes this rule ?
(I. Tax & Central Excise, 1995)
(*a*) EPVAF (*b*) GPWBE (*c*) UCJOP (*d*) XFMQU

12. Number of letters skipped in between adjacent letters in the series decreases by one. Which of the following series observes this rule ? **(Assistant Grade, 1996)**
(*a*) DBPUY (*b*) DBUYP (*c*) DBYPU (*d*) DBYUP

13. Number of letters skipped in between adjacent letters in the series are multiples of 3. Which of the following series observes this rule ?
(*a*) AELPZ (*b*) GKOTZ (*c*) LORUX (*d*) DHLPU

14. Number of letters skipped in between adjacent letters in the series is in the order of $1^2, 2^2, 3^2$. Which of the following series observes the rule given above ?
(*a*) CEJT (*b*) EGLO (*c*) EGLP (*d*) RTWZ
(Assistant Grade, 1993)

15. Select the series in which the letters skipped in between adjacent letters decrease in order. **(S.S.C. 1995)**
(*a*) AGMRV (*b*) HNSWA (*c*) NSXCH (*d*) SYDHK

16. Select the series in which the letters skipped in between adjacent letters do not decrease in order.
(*a*) EQZFI (*b*) GWIQU (*c*) MGVFK (*d*) PJXHM

17. Number of letters skipped between adjacent letters in the series is in the order of 2, 5, 7, 10. Which of the following series observes the rule given above ?
(*a*) CEGLT (*b*) FNKOT (*c*) QTZHS (*d*) SYBEP
(Assistant Grade, 1993)

18. In which of the following letter sequences, there is a letter leaving two letters of the alphabet in order, after the letters placed at odd-numbered positions and leaving one letter of the alphabet in order after the letters placed at even-numbered positions ? **(C.B.I. 1995)**
(*a*) ADFIKN (*b*) BEGJLN (*c*) CFHKLO (*d*) DFIKNP

19. Select that series in which letters are not according to a general rule.
(*a*) CEGIKM (*b*) MORTVX (*c*) PRTVXZ (*d*) ZBDFHJ
(S.S.C. 1996)

ANSWERS

1. (*a*) : M N O P Q R S T U V W X Y Z A B C D E
2 2 2 2 2 2

2. (*a*) : B C D E F G H I J K L M N O P Q R
1 3 3 5
1, 3, 3, 5 are all odd numbers.

3. (*c*) : R S T U V W X Y Z A B C D E F G H I J K L
3 3 3 3 3

4. (*b*) : A B C D E F G H I J K L M N O P Q R S T U V W X Y
2 4 6 8
2, 4, 6, 8 are consecutive even numbers.

5. (*d*) : I J K L M N O P Q R S T U V W
1 2 3 4
+1 +1 +1

6. (*a*) : K L M N O P Q R S T U V W X Y
1 2 3 4
+1 +1 +1

7. (*b*) : Q N M L K J I H G F E D C B A
1 2 3 4
+1 +1 +1

8. (*b*) : B C D E F G H I J K L M N O P Q R S T U V
1 2 3 4 5
+1 +1 +1 +1

9. (*c*) : E F G H I J K L M N O P Q R S T
4 3 2 1 0
−1 −1 −1 −1

10. (*c*) : U T S R Q P O N M L K J I H G F
2 2 2 2 2

11. (*b*) : G H I J K L M N O P Q R S T U V W X Y Z A B C D E
8 6 4 2
−2 −2 −2

12. (*d*) : D C B A Z Y X W V U T S R Q P
1 2 3 4

13. (*a*) : A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
3 6 3 9

3, 6, 3, 9 are multiples of 3.

14. (*a*) : C D E F G H I J K L M N O P Q R S T
1 4 9
(1^2) (2^2) (3^2)

15. (*d*) : S T U V W X Y Z A B C D E F G H I J K
5 4 3 2
−1 −1 −1

16. (*d*) : E Q Z F I G W I Q U
11 8 5 2 15 11 7 3
−3 −3 −3 −4 −4 −4
M G V F K P J X H M
19 14 9 4 19 13 9 4
−5 −5 −5 −6 −4 −5

17. (*c*) : Q R S T U V W X Y Z A B C D E F G H I J K L M N O P Q R S
2 5 7 10

18. (*a*) : A B C D E F G H I J K L M N
2 1 2 1 2

19. (*b*) : M N O P Q R S T U V W X
1 2 1 1 1

TYPE 4 : ALPHABETICAL QUIBBLE

In this type of questions, you are given alphabets from A to Z. The position of a letter is given in the form of a puzzle. The candidate is required to find this letter. However, sometimes a random letter series is given and the candidate is required to find out how many times a letter satisfying the conditions specified in the question, occurs.

Ex. 1 In the following alphabet series, which letter is eighth to the left of sixteenth letter from the right end ?

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z

(*a*) B (*b*) S (*c*) C (*d*) H (*e*) X

Sol. Counting from the right end of the given alphabet series *i.e.*, from Z, the sixteenth letter is K. Counting from K towards the left, the eighth letter is C. Hence, the answer is (*c*).

Ex. 2 If the following alphabet series is written in the reverse order, which letter will be fifth to the left of the fourteenth letter from the left ?

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z

(*a*) R (*b*) I (*c*) S (*d*) H (*e*) V

Sol. The new alphabet series obtained after reversing the order of alphabets is :

Z Y X W V U T S R Q P O N
M L K J I H G F E D C B A

Counting from the left end in the above series i.e., from Z, the fourteenth letter is M.

Counting from M towards the left, the fifth letter is R.

Hence, the answer is (*a*).

Ex. 3 How many D's are there in the following series which are immediately followed by W but not immediately preceded by K ?

K D C W K D W N K G D W W D H K V D W Z D W

(*a*) One (*b*) Two (*c*) Three (*d*) Four (*e*) Nil

Sol. Clearly, D's satisfying the given conditions can be marked as under :

K D C W K D W N K G [D] W W D H K V [D] W Z [D] W

Hence, the answer is (*c*).

EXERCISE 10G

Directions : ***Each of the following questions is based on the following alphabet series.***

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z

1. Which letter is exactly midway between H and S in the given alphabet ?

(*a*) L (*b*) M (*c*) N (*d*) O (*e*) No such letter

(S.B.I.P.O. 1994)

2. In the English alphabet, which letter will be to the immediate left of M ?

(*a*) N (*b*) L (*c*) O (*d*) K (*e*) None of these

3. Which letter is sixteenth to the right of the letter which is fourth to the left of I ?

(*a*) S (*b*) T (*c*) U (*d*) V (*e*) Y

4. Which alphabet comes immediately before the sixth alphabet from the left extreme of the given alphabets ? **(L.I.C. 1994)**

(*a*) E (*b*) F (*c*) G (*d*) U (*e*) V

5. Which letter is the seventh to the right of the thirteenth letter from your left ?
(*a*) S (*b*) T (*c*) U (*d*) V (*e*) None of these
(Bank P.O. 1993)

6. Which letter will be the sixth to the right of the eleventh letter from the right end of the alphabet ?
(*a*) K (*b*) V (*c*) J (*d*) U (*e*) None of these

7. Which letter is seventh to the right of the eighteenth letter from the right end of the alphabet ? **(B.S.R.B. 1995)**
(*a*) K (*b*) O (*c*) P (*d*) R (*e*) None of these

8. If the above alphabet are divided in two equal halves — from A to M and N to Z, which letter in the later half would be corresponding to the letter J ?
(*a*) Q (*b*) V (*c*) X (*d*) W (*e*) None of these
(Bank P.O. 1993)

9. Which letter is midway between 22nd letter from the left and 21st letter from the right ? **(Bank P.O. 1995)**
(*a*) L (*b*) M (*c*) O (*d*) P (*e*) None of these

10. If the above alphabet is written in the reverse order, which will be the eighth letter to the right of O ?
(*a*) F (*b*) G (*c*) V (*d*) W (*e*) None of these

11. If the above alphabets were written in the reverse order, which will be the fifth letter to the left of the ninth letter from the right ?
(*a*) P (*b*) N (*c*) D (*d*) W (*e*) M

12. If the given alphabet is arranged in reverse order, which letter will be the eighth letter to the left of the seventh letter counting from the right end ?
(*a*) N (*b*) O (*c*) P (*d*) Q (*e*) None of these
(Bank P.O. 1992)

13. If the above alphabet are written in the reverse order, which letter will be twelfth to the left of the sixteenth letter from your left ?
(*a*) D (*b*) V (*c*) W (*d*) X (*e*) None of these

14. If the given sequence of letters is written in a reverse order, which of the following will be the seventh letter to the left of eighth letter from your right ?
(*a*) L (*b*) M (*c*) O (*d*) P (*e*) None of these
(Bank P.O. 1995)

15. Which letter should be ninth letter to the left of ninth letter from the right, if the first half of the given alphabet is reversed ? **(U.T.I. 1993)**
(*a*) D (*b*) E (*c*) F (*d*) I (*e*) None of these

16. If every alternate letter starting from B is deleted from the given alphabet, which of the following will be the tenth letter from the right end ?
(*a*) G (*b*) D (*c*) Q (*d*) H (*e*) None of these
(Bank P.O. 1995)

17. Write the above English alphabet in reverse order. First cancel every second letter and then select that letter which divides the remaining letters of the alphabet in two equal parts. This letter is :
(*a*) L (*b*) M (*c*) N (*d*) P (*e*) None of these

18. If the letters of the given alphabet interchange positions, so that A takes the place of Z and Z takes the place of A; B takes the place of Y and Y takes the place of B and so on, what will be the thirteenth letter from the right ?
(*a*) M (*b*) N (*c*) O (*d*) L (*e*) None of these

19. If the alphabet is written in the reverse order and every alternate letter starting with Y is dropped, which letter will be exactly in the middle of the remaining letters of the alphabet ? **(Bank P.O. 1996)**

(*a*) M (*b*) N (*c*) O (*d*) M or O (*e*) None of these

20. In the given alphabet, starting from the fifth letter from the left, if twelve letters are written in reverse order, then which letter will be the seventh to the left of the fourteenth letter from the right ? **(Bank P.O. 1994)**

(*a*) H (*b*) L (*c*) M (*d*) N (*e*) None of these

21. If the second half of the given alphabet is written in reverse order, which letter will be seventh to the right of the twelfth letter from the left end ?

(*a*) R (*b*) S (*c*) U (*d*) V (*e*) None of these

22. Which letter should be fourth to the left of twelfth letter from the right if the second half of the given alphabet is reversed ? **(Bank P.O. 1993)**

(*a*) J (*b*) K (*c*) L (*d*) M (*e*) None of these

23. If the first and the second letters interchange their positions and similarly the third and the fourth letters, the fifth and the sixth letters and so on, which letter will be the seventeenth from your right ?

(*a*) F (*b*) H (*c*) I (*d*) J (*e*) None of these

24. If the first ten letters of the given alphabet are written in the reverse order, which of the following letters will be the seventh to the left of the twelfth letter from the right end ? **(Bank P.O. 1994)**

(*a*) B (*b*) C (*c*) H (*d*) I (*e*) None of these

25. If every alternate letter starting from B of the given alphabet is written in small letters, rest all are written in capital letters, how will the month of 'September' be written ? **(Bank P.O. 1995)**

(*a*) SEpteMbeR (*b*) SEptembER (*c*) sePTemBeR

(*d*) SEptEMbEr (*e*) None of these

26. If the alternate letters in the given alphabet starting from A are written in small and rest all in capital letters, which of the following will represent the third month after July ? **(Bank P.O. 1995)**

(*a*) OCTOBER (*b*) OCtObEr (*c*) oCtObEr

(*d*) ocToBeR (*e*) None of these

27. If every even letter beginning from B is replaced by odd number beginning with 3, which letter/number will be the third to the right of the tenth number/letter counting from your right ? **(Bank P.O. 1996)**

(*a*) M (*b*) S (*c*) 11 (*d*) 23 (*e*) None of these

28. Which letter will be sixth to the right of the third letter from left of the letter which is exactly in the middle of the letters in the series given below ?

A B C D E Z Y X W V Q R S T

U F G H I J K L M N O P A **(Bank P.O. 1996)**

(*a*) F (*b*) G (*c*) Q (*d*) R (*e*) None of these

29. Which is the letter as far from the first letter of the alphabet given below as the letter C is from the letter midway between K and R in 'QUICKSILVER' ?

(*a*) C (*b*) D (*c*) F (*d*) J (*e*) V

30. How many A's are there in the following series which are immediately followed by B as well as immediately preceded by Z ? **(Bank P.O. 1993)**

A M B Z A N A A B Z A B A Z B A P Z A B A Z A B

(*a*) Nil (*b*) One (*c*) Two (*d*) Three (*e*) More than three

31. In the following list of letters, how many O's are followed by Q's but not preceded by D's ? **(C.B.I. 1993)**

D O Q O D Q O D O D Q D O Q D S D Q P
O Q D S S S D O Q O Q D O Q D D D O Q

(*a*) 0 (*b*) 1 (*c*) 2 (*d*) 3

32. How many T's are there in the following sequence which are immediately preceded by P but not immediately followed by S ? **(Bank P.O. 1995)**

S T P Q T S P T R P T S R P S T Q P T R P T M P T S

(*a*) None (*b*) One (*c*) Two (*d*) Three (*e*) None of these

33. In the following series, count each N which is immediately followed by X but X is not immediately followed by T. How many such N's are there ? **(R.B.I. 1990)**

N X N T Q M N X T M X N X C N Q M N N X Q N X T X N A M X N X M

(*a*) 2 (*b*) 4 (*c*) 5 (*d*) 7 (*e*) 9

34. In the following letter sequence, how many n's are followed by m but not preceded by h ? **(S.S.C. 1996)**

a g r h t n m b c n m l b u v n m h e r h
n m g f e h n m e c n m w q a n m h l b

(*a*) 4 (*b*) 5 (*c*) 6 (*d*) 7

Directions (*Questions 35 to 38*) : *Study the letter series given below and answer the questions that follow :* **(Hotel Management, 1992)**

H D Y S M W N B Q P O C R T B L Z V E G U F

35. Which is the only letter that occurs twice ?

(*a*) B (*b*) E (*c*) M (*d*) S

36. Which two neighbours in the given arrangement are farthest in the alphabetical order ?

(*a*) B and Q (*b*) D and Y (*c*) U and F (*d*) V and E

37. Which letter has the same neighbours as in the alphabetical order although they have changed places ?

(*a*) M (*b*) N (*c*) O (*d*) P

38. Which three letters have the same distance as they have in the alphabetical order although they have changed places ?

(*a*) HMP (*b*) NQZ (*c*) QOE (*d*) YLF

ANSWERS

1. (*e*) : There are ten letters between H and S and as such, there is no letter which lies exactly in the middle.

2. (*b*) : Clearly, L is the letter to the immediate left of M.

3. (*c*) : Clearly, the fourth letter to the left of I is E. The sixteenth letter to the right of E is U.

4. (*a*) : The sixth letter from the left is F. E comes immediately before F.

5. (*b*) : Counting from the left *i.e.*, A in the given alphabet, the thirteenth letter is M. Counting from M towards the right, the seventh letter is T.

6. (*b*) : Counting from the right in the given alphabet series *i.e.*, Z, the eleventh letter is P. The sixth letter to the right of P is V.

7. (*c*) : Counting from the right in the given alphabet series *i.e.*, from Z, the eighteenth letter is I.
The seventh letter to the right of I is P.

8. (*d*) : J is the tenth letter in the first half.
The tenth letter in the later half is W.

9. (*c*) : 22nd letter from the left is V. 21st letter from the right is F.
The letter midway between F and V is N.

10. (*b*) : The new alphabet series is :

Z Y X W V U T S R Q P O N
M L K J I H G F E D C B A

Clearly, the eighth letter to the right of O is G.

11. (*b*) : The new alphabet series is :

Z Y X W V U T S R Q P O N
M L K J I H G F E D C B A

The ninth letter from the right is I.
The fifth letter to the left of I is N.

12. (*b*) : The new alphabet series is as shown in Solution 11.
Counting from the right, the seventh letter is G.
The eighth letter to the left of G is O.

13. (*c*) : The new alphabet series is as shown in Solution 11.
The sixteenth letter from the left is K.
Counting from K towards the left, the twelfth letter is W.

14. (*c*) : The new alphabet series is as shown in Solution 11.
The eighth letter from the right is H.
The seventh letter to the left of H is O.

15. (*b*) : The new alphabet series is :

M L K J I H G F E D C B A
N O P Q R S T U V W X Y Z

The ninth letter from the right is R.
The ninth letter to the left of R is E.

16. (*a*) : The new alphabet series is :

A C E G I K M O Q S U W Y

The tenth letter from the right is G.

17. (*c*) : The new alphabet series is :

Z Y X W V U T S R Q P O N
M L K J I H G F E D C B A

Cancelling every second letter, the above series becomes

Z X V T R P N L J H F D B

The middle letter is N.

18. (*a*) : The new alphabet series is :

Z Y X W V U T S R Q P O N
M L K J I H G F E D C B A

Counting from the right in the above series *i.e.*, A, the thirteenth letter is M.

19. (*b*) : Same as Solution 17.

20. (*e*) : The new alphabet series is :

A B C D P O N M L K J I H
G F E Q R S T U V W X Y Z

The fourteenth letter from the right is H.
The seventh letter to the left of H is O.

21. (*c*) : The new alphabet series is :

A B C D E F G H I J K L M
Z Y X W V U T S R Q P O N

The twelfth letter from the left is L.
The seventh letter to the right of L is U.

22. (*b*) : The new alphabet series is as shown in Solution 21.
The twelfth letter from the right is Y.
The fourth letter to the left of Y is K.

23. (*c*) : The new alphabet series is :

B A D C F E H G J I L K N
M P O R Q T S V U X W Z Y

The seventeenth letter from the right is I.

24. (*b*) : The new alphabet series is :

J I H G F E D C B A K L M
N O P Q R S T U V W X Y Z

The twelfth letter from the right is O.
The seventh letter to the left of O is C.

25. (*d*) : The new alphabet series is :

A b C d E f G h I j K l M
n O p Q r S t U v W x Y z

Clearly 'SEPTEMBER' will be written as 'SEptEMbEr'.

26. (*d*) : The new alphabet series is :

a B c D e F g H i J k L m
N o P q R s T u V w X y Z

The third month after July is October.
Clearly, 'OCTOBER' will be written as 'ocToBeR'.

27. (*e*) : The new series is :

A 3 C 5 E 7 G 9 I 11 K 13 M
15 O 17 Q 19 S 21 U 23 W 25 Y 27

Counting from the right, the tenth character is Q.
The third character to the right of Q is 21.

28. (*b*) : The letter in the middle of the given series is T. The third letter to the left of T is Q.
The sixth letter to the right of Q is G.

29. (*d*) : The letter midway between K and R in 'QUICKSILVER' is L. In the alphabet, L is the ninth letter after C. Similarly, J is the ninth letter from the first letter of the alphabet, which is A.

30. (*d*) : A M B Z A N A A B Z [A] B A Z B A P Z [A] B A Z [A] B

31. (*c*) : D O Q O D Q O D O D Q D O Q D S D Q P [O]

Q D S S S D O Q [O] Q D O Q D D D O Q

32. (*d*) : S T P Q T S P [T] R P T S R P S T Q P [T] R P [T] M P T S

33. (*b*) : N [X] N T Q M N X T M X [N] X C N Q M
N [N] X Q N X T X N A M X [N] X M

34. (*b*) : a g r h t [n] m b c [n] m l b u v [n] m h e r
h n m g f e h n m e c [n] m w q a [n] m h l b

35. (*a*) : Clearly, B occurs twice.

36. (*b*) : Clearly, D and Y are neighbours in the given series and are separated by the maximum number of letters *i.e.*, 20 in the English alphabet.

37. (*d*) : P has O and Q as its neighbours in the given series as well as in the English alphabet.

38. (*d*) : There are 12 letters between L and Y and 5 letters between F and L in the given series as well as in the English alphabet.

TYPE 5 : WORD FORMATION

Ex. 1. Select the combination of numbers so that letters arranged accordingly will form a meaningful word.

V	A	R	S	T	E
1	2	3	4	5	6

(*a*) 2, 3, 1, 6, 4, 5 (*b*) 4, 5, 2, 3, 1, 6 (*c*) 6, 3, 4, 5, 2, 1 (*d*) 3, 2, 4, 5, 6, 1

Sol. Clearly, the given letters, when arranged in the order 4, 5, 2, 3, 1, 6 form the word 'STARVE'. Hence, the answer is (*b*).

Ex. 2. If it is possible to make a meaningful word with the second, the sixth, the ninth and the twelfth letters of the word 'CONTRIBUTION', which of the following will be the last letter of that word ? If more than one such words can be made, give M as the answer and if no such word is there, give X as the answer.

(*a*) N (*b*) O (*c*) T (*d*) M (*e*) X

Sol. The second, sixth, ninth and twelfth letters of the word 'CONTRIBUTION' are O, I, T and N. Clearly, only one word can be formed using these letters, which is INTO.
The last letter in INTO is O.
Hence, the answer is (*b*).

Ex. 3. Choose one word out of the given alternatives, which cannot be formed from the letters of the word CONSULTATION.

(*a*) CONSTANT (*b*) NATION (*c*) SALUTE (*d*) STATION

Sol. Carefully looking at the words, we find that the word 'CONSULTATION' does not contain the letter E. So, the word 'SALUTE' cannot be formed.
Hence, the answer is (*c*).

Note : In such type of questions, remember that each letter in the given word is to be used only once.

EXERCISE 10H

Directions (*Questions 1 to 40*) : ***In each of the following questions, a group of letters is given which are numbered 1, 2, 3, 4, 5 and 6. Below are given four alternatives containing combinations of these numbers. Select that combination of numbers so that letters arranged accordingly, form a meaningful word.***

1. T R I F U
1 2 3 4 5 **(Railways, 1995)**
(*a*) 3, 1, 2, 4, 5 (*b*) 4, 2, 5, 3, 1 (*c*) 4, 3, 2, 1, 5 (*d*) 5, 3, 2, 1, 4

2. A C E S T H
1 2 3 4 5 6
(*a*) 6, 1, 4, 5, 3, 2 (*b*) 2, 6, 1, 4, 5, 3 (*c*) 4, 3, 5, 6, 1, 2 (*d*) 6, 3, 2, 1, 4, 5

3. G T A E N M
1 2 3 4 5 6
(*a*) 1, 3, 2, 5, 4, 6 (*b*) 1, 3, 2, 6, 4, 5 (*c*) 6, 3, 5, 1, 4, 2 (*d*) 6, 3, 1, 5, 4 2

4. N R O C T A
1 2 3 4 5 6
(*a*) 1, 6, 2, 4, 3, 5 (*b*) 2, 3, 5, 4, 6, 1 (*c*) 4, 6, 2, 5, 3, 1 (*d*) 6, 5, 2, 3, 1, 4

5. G A N I M E
1 2 3 4 5 6
(*a*) 1, 2, 4, 3, 6, 5 (*b*) 6, 3, 4, 1, 5, 2 (*c*) 5, 2, 1, 4, 3, 6 (*d*) 2, 5, 1, 4, 3, 6

6. D I F E R N
1 2 3 4 5 6
(*a*) 1, 4, 3, 6, 2, 5 (*b*) 6, 4, 3, 5, 2, 1 (*c*) 3, 5, 2, 4, 6, 1 (*d*) 5, 4, 3, 2, 6, 1

7. K A T C E L
1 2 3 4 5 6
(*a*) 4, 2, 3, 1, 5, 6 (*b*) 1, 2, 4, 5, 6, 3 (*c*) 6, 5, 3, 2, 4, 1 (*d*) 3, 2, 4, 1, 6, 5

8. R U S G A
1 2 3 4 5
(*a*) 1, 5, 4, 2, 3 (*b*) 5, 3, 4, 1, 2 (*c*) 3, 2, 4, 5, 1 (*d*) 4, 5, 3, 2, 1

9. C E L S M U
1 2 3 4 5 6
(*a*) 4, 6, 3, 5, 2, 1 (*b*) 5, 6, 4, 1, 3, 2 (*c*) 4, 6, 5, 2, 3, 1 (*d*) 5, 2, 3, 1, 6, 4

10. H N R C A B
1 2 3 4 5 6
(*a*) 4, 1, 5, 6, 2, 3 (*b*) 6, 3, 5, 2, 4, 1 (*c*) 3, 5, 6, 4, 1, 2 (*d*) 2, 5, 3, 4, 1, 6

11. E L B M A G
1 2 3 4 5 6
(*a*) 6, 5, 4, 3, 2, 1 (*b*) 3, 1, 6, 4, 5, 2 (*c*) 4, 5, 6, 3, 1, 2 (*d*) 2, 1, 6, 3, 5, 4

12. R T A O U H
1 2 3 4 5 6
(*a*) 1, 3, 4, 5, 6, 2 (*b*) 2, 3, 6, 4, 5, 1 (*c*) 6, 3, 2, 4, 5, 1 (*d*) 3, 5, 2, 6, 4, 1

13. T L E M N A
1 2 3 4 5 6
(*a*) 2, 6, 4, 5, 3, 1 (*b*) 3, 2, 4, 6, 5, 1 (*c*) 4, 3, 5, 1, 6, 2 (*d*) 5, 3, 2, 4, 6, 1

14. A E H R K N
1 2 3 4 5 6
(*a*) 4, 1, 5, 3, 2, 6 (*b*) 6, 1, 5, 3, 4, 2 (*c*) 3, 1, 6, 5, 2, 4 (*d*) 5, 3, 1, 4, 2, 6

15. I N L A S G
1 2 3 4 5 6
(*a*) 6, 1, 3, 5, 4, 2 (*b*) 5, 1, 6, 2, 4, 3 (*c*) 3, 4, 6, 1, 2, 5 (*d*) 2, 4, 3, 6, 1, 5

16. T L P N A E
1 2 3 4 5 6
(*a*) 3, 2, 5, 4, 6, 1 (*b*) 3, 2, 5, 4, 1 6 (*c*) 4, 5, 3, 6, 2, 1 (*d*) 4, 6, 1, 3, 5, 2

17. R P E D I
1 2 3 4 5
(*a*) 1, 3, 2, 5, 4 (*b*) 2, 1, 5, 4, 3 (*c*) 3, 2, 1, 5, 4 (*d*) 4, 3, 2, 1, 5

18. I P E L O C
1 2 3 4 5 6 **(Railways, 1995)**
(*a*) 1, 4, 3, 5, 2, 6 (*b*) 2, 5, 4, 1, 6, 3 (*c*) 3, 4, 5, 1, 2, 6 (*d*) 4, 5, 1, 2, 3, 6

19. R M N B U E
1 2 3 4 5 6
(*a*) 2, 6, 3, 4, 1, 5 (*b*) 4, 6, 3, 2, 1, 5 (*c*) 3, 5, 2, 4, 6, 1 (*d*) 1, 5, 4, 2, 6, 3

20. T N D R A E
1 2 3 4 5 6
(*a*) 1, 6, 2, 3, 5, 4 (*b*) 3, 6, 2, 4, 5, 1 (*c*) 5, 4, 3, 6, 2, 1 (*d*) 4, 5, 3, 6, 2, 1

21. E H R A S P
1 2 3 4 5 6
(*a*) 5, 2, 4, 6, 1, 3 (*b*) 6, 2, 3, 4, 5, 1 (*c*) 2, 4, 6, 1, 3, 5 (*d*) 3, 4, 2, 1, 6, 5

22. T E L S C A
1 2 3 4 5 6
(*a*) 1, 2, 3, 4, 6, 5 (*b*) 4, 6, 5, 1, 2, 3 (*c*) 5, 6, 4, 1, 3, 2 (*d*) 6, 5, 3, 2, 4, 1

23. E O C D L I
1 2 3 4 5 6
(*a*) 3, 2, 5, 4, 6, 1 (*b*) 4, 2, 3, 5, 6, 1 (*c*) 3, 2, 4, 5, 6, 1 (*d*) 4, 2, 3, 6, 5, 1

24. A M D E N R
1 2 3 4 5 6
(*a*) 2, 1, 5, 3, 4, 6 (*b*) 6, 4, 2, 1, 5, 3 (*c*) 3, 4, 5, 2, 1, 6 (*d*) 1, 6, 2, 4, 5, 3

25. T I R B H G
1 2 3 4 5 6
(*a*) 1, 3, 2, 4, 6, 5 (*b*) 4, 3, 2, 6, 5, 1 (*c*) 4, 5, 2, 3, 6, 1 (*d*) 3, 2, 6, 5, 4, 1

26. R A C E T
1 2 3 4 5
(*a*) 1, 2, 3, 4, 5 (*b*) 3, 2, 1, 4, 5 (*c*) 5, 2, 3, 4, 1 (*d*) 5, 1, 2, 3, 4

27. L A E M V R
1 2 3 4 5 6
(*a*) 1, 2, 6, 4, 3, 5 (*b*) 4, 2, 6, 5, 3, 1 (*c*) 5, 3, 6, 4, 2, 1 (*d*) 6, 3, 1, 4, 2, 5

28. R T E O D P
1 2 3 4 5 6
(*a*) 1, 3, 5, 6, 4, 2 (*b*) 2, 3, 1, 6, 4, 5 (*c*) 5, 3, 6, 4, 1, 2 (*d*) 6, 3, 5, 1, 4, 2

29. E H N T O R
1 2 3 4 5 6
(*a*) 2, 5, 3, 4, 1, 6 (*b*) 4, 2, 6, 5, 3, 1 (*c*) 2, 5, 6, 3, 1, 4 (*d*) 4, 2, 5, 6, 3, 1

30. J C O P T E R
1 2 3 4 5 6 7
(*a*) 1, 3, 4, 5, 6, 7, 2 (*b*) 2, 6, 4, 5, 1, 3, 7
(*c*) 7, 6, 4, 5, 1, 3, 2 (*d*) 4, 7, 3, 1, 6, 2, 5

31. A C P E T S
1 2 3 4 5 6 **(Railways, 1995)**
(*a*) 1, 6, 3, 4, 2, 5 (*b*) 2, 3, 4, 1, 5, 6 (*c*) 5, 6, 3, 4, 1, 2 (*d*) 6, 5, 3, 4, 2, 1

32. R T A N U E
1 2 3 4 5 6
(*a*) 1, 3, 2, 6, 4, 5 (*b*) 3, 2, 4, 6, 1, 5 (*c*) 4, 3, 2, 5, 1, 6 (*d*) 4, 6, 5, 2, 3, 1

33. I N E T O C
1 2 3 4 5 6
(*a*) 2, 5, 4, 1, 6, 3 (*b*) 3, 6, 4, 1, 2, 5 (*c*) 4, 3, 6, 5, 2, 1 (*d*) 6, 5, 2, 3, 4, 1

34. T P S L O I
1 2 3 4 5 6
(*a*) 4, 6, 2, 5, 3, 1 (*b*) 2, 5, 4, 3, 6, 1 (*c*) 2, 6, 3, 1, 5, 4 (*d*) 3, 6, 4, 2, 5, 1

35. M F I A N E
1 2 3 4 5 6
(*a*) 1, 6, 2, 3, 4, 5 (*b*) 2, 4, 1, 3, 5, 6 (*c*) 5, 6, 2, 3, 1, 4 (*d*) 4, 2, 3, 1, 6, 5

36. N A E H L D
1 2 3 4 5 6
(*a*) 2, 6, 4, 3, 5, 1 (*b*) 4, 2, 1, 6, 5, 3 (*c*) 4, 3, 6, 5, 2, 1 (*d*) 2, 1, 6, 4, 3, 5

37. E T C K O P
1 2 3 4 5 6
(*a*) 3, 1, 4, 5, 6, 2 (*b*) 6, 5, 3, 4, 1, 2 (*c*) 2, 1, 6, 5, 3, 4 (*d*) 4, 1, 2, 3, 5, 6

38. E L G N I M
1 2 3 4 5 6
(*a*) 6, 5, 4, 3, 2, 1 (*b*) 3, 1, 2, 6, 5, 4 (*c*) 6, 5, 3, 2, 1, 4 (*d*) 3, 5, 6, 2, 1, 4

39. D A I M E N
1 2 3 4 5 6
(*a*) 1, 5, 4, 2, 3, 6 (*b*) 4, 5, 1, 2, 3, 6 (*c*) 4, 2, 3, 1, 5, 6 (*d*) 1, 2, 5, 6, 3, 4

40. R E S T L U
1 2 3 4 5 6
(*a*) 3, 4, 6, 1, 2, 5 (*b*) 4, 5, 3, 2, 6, 1 (*c*) 5, 6, 3, 4, 1, 2 (*d*) 6, 5, 2, 1, 4, 3

41. Which one word can be formed from the following letters ?
a a d e f g r s u **(C.B.I. 1993)**
(*a*) stagnation (*b*) safeguard (*c*) pseudo-grade (*d*) grandson

42. Which one word can be formed from the following letters ?
a a b c i l l n o o o r t **(C.B.I. 1993)**
(*a*) collapsible (*b*) locomotive (*c*) colourfulness (*d*) collaboration

43. The letters of the word NUMKIPP are in disorder. If they are arranged in proper order, the name of a vegetable is formed. What is the last letter of the word so formed ?

(*a*) K (*b*) M (*c*) N (*d*) P (*e*) U

44. If by arranging the letters of the word NABMODINT, the name of a game is formed, what are the first and the last letters of the word so formed ?

(*a*) B, T (*b*) B, N (*c*) N, D (*d*) A, T (*e*) M, T

45. If a meaningful word can be formed by rearranging the letters USCALA, the first letter of the word so formed is the answer. If no such word can be formed, the answer is X.

(*a*) C (*b*) S (*c*) A (*d*) L (*e*) U

46. If it is possible to form a word with the first, fourth, seventh and eleventh letters in the word 'SUPERFLUOUS', write the first letter of that word. Otherwise, X is the answer.

(*a*) S (*b*) L (*c*) O (*d*) E (*e*) X

47. If you pick up from the following alphabet, the sixth and the fourteenth letters from your right and then pick up the fifth and twentieth letters from your left and form a meaningful word, what is the first letter of that word ? **(Bank P.O. 1996)**

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z

(*a*) M (*b*) E (*c*) No word can be formed
(*d*) More than one word can be formed (*e*) None of these

48. If with the third, fourth, fifth, seventh and tenth letters of the word 'PERSONALITY', a meaningful word is formed, then first letter of the word is the answer. If no word is possible then X is the answer.

(*a*) O (*b*) T (*c*) R (*d*) S (*e*) X

49. If it is possible to make a meaningful word with the third, fifth, eighth and tenth letters of the word 'DISTRIBUTE', which of the following will be the third letter of that word ? If no such word can be made, give X as the answer and if more than one such word can be made, give M as the answer. **(Bank P.O. 1995)**

(*a*) S (*b*) R (*c*) E (*d*) X (*e*) M

50. If we make a meaningful word with the first, fourth, ninth and fourteenth letters of the word 'ADMINISTRATION', which of the following will be the third letter of that word from the right end of that word ?

(*a*) A (*b*) I (*c*) N (*d*) R (*e*) None of these

51. If it is possible to make a meaningful word with the second, the fifth and the eighth letters of the word 'CARETAKER', which of the following will be the first letter of that word ? If no such word can be made, give X as the answer. If more than one such word can be made, give M as the answer. **(Bank P.O. 1994)**

(*a*) A (*b*) E (*c*) T (*d*) X (*e*) M

52. A meaningful word starting with A is made from the first, the second, the fourth, the fifth and the sixth letters of the word 'CONTRACT'. Which of the following is the middle letter of the word ?

(*a*) C (*b*) O (*c*) R (*d*) T (*e*) None of these

53. A meaningful word is made if we take the first, fourth, fifth, seventh, tenth, eleventh and the twelfth letters of the word 'FELICITATIONS'. Which of the following will be the fifth letter of that word from the right end of that word ?

(*a*) T (*b*) C (*c*) N (*d*) I (*e*) None of these

(U.T.I. 1993)

54. If it is possible to make a meaningful word with the fourth, the eighth and the tenth letters of the word 'COUNTERACT', which of the following will be the last letter of that word ? If no such word can be made, give X as the answer. If more than one such word can be made, give M as the answer.

(*a*) A (*b*) N (*c*) T (*d*) X (*e*) M

55. If it is possible to make a meaningful word with the first, the fourth, the seventh and the eleventh letters of the word 'INTERPRETATION', which of the following will be third letter of that word ? If more than one such word can be made, give M as the answer and if no such word can be made, give X as the answer.

(*a*) I (*b*) R (*c*) T (*d*) X (*e*) M

(S.B.I.P.O. 1997)

56. If it is possible to make a meaningful word out of the second, the fourth, the fifth and the eighth letters of the word 'ILLOGICAL' then which of the following will be the third letter of the so formed word ? If more than one word can be formed then give X as the answer. If no meaningful word can be formed, then give Z as the answer. **(L.I.C. 1994)**

(*a*) A (*b*) G (*c*) O (*d*) X (*e*) Z

57. If it is possible to make a meaningful word with the second, the fifth, the tenth and the twelfth letters of the word 'METROPOLITAN', which of the following will be the third letter of that word ? If no such word can be made give X as the answer and if more than one such word can be made, give M as the answer.

(*a*) N (*b*) Q (*c*) T (*d*) X (*e*) M

58. If it is possible to make a meaningful word with the third, the fifth, the seventh and the tenth letters of the word 'PROJECTION' which of the following is the third letter of that word ? If no such word can be made, give X as the answer. If more than one such word can be made, give M as the answer.

(*a*) O (*b*) N (*c*) T (*d*) X (*e*) M

(Bank P.O. 1995)

59. If it is possible to make a meaningful word with the fourth, the seventh, the eleventh and the thirteenth letters of the word 'CATEGORISATION' which of the following will be the first letter of that word ? If no such word can be made, give X as the answer. If more than one such word can be made, give M as the answer. **(Bank P.O. 1995)**

(*a*) O (*b*) R (*c*) T (*d*) X (*e*) M

60. If it is possible to make a meaningful word with the first, the third, the seventh and the ninth letters of the word SEPARATION, which of the following will be the third letter of that word ? If no such word can be made, give X as the answer and if more than one such word can be made, give M as the answer.

(*a*) O (*b*) P (*c*) T (*d*) X (*e*) M

ANSWERS

1. (*b*) : FRUIT	**2.** (*b*) : CHASTE	**3.** (*d*) : MAGNET
4. (*c*) : CARTON	**5.** (*b*) : ENIGMA	**6.** (*c*) : FRIEND
7. (*d*) : TACKLE	**8.** (*c*) : SUGAR	**9.** (*b*) : MUSCLE
10. (*b*) : BRANCH	**11.** (*a*) : GAMBLE	**12.** (*d*) : AUTHOR
13. (*c*) : MENTAL	**14.** (*c*) : HANKER	**15.** (*b*) : SIGNAL
16. (*a*) : PLANET	**17.** (*b*) : PRIDE	**18.** (*b*) : POLICE
19. (*c*) : NUMBER	**20.** (*c*) : ARDENT	**21.** (*b*) : PHRASE
22. (*c*) : CASTLE	**23.** (*d*) : DOCILE	**24.** (*b*) : REMAND
25. (*b*) : BRIGHT	**26.** (*d*) : TRACE	**27.** (*b*) : MARVEL
28. (*c*) : DEPORT	**29.** (*b*) : THRONE	**30.** (*d*) : PROJECT
31. (*a*) : ASPECT	**32.** (*c*) : NATURE	**33.** (*a*) : NOTICE
34. (*c*) : PISTOL	**35.** (*b*) : FAMINE	**36.** (*b*) : HANDLE
37. (*b*) : POCKET	**38.** (*a*) : MINGLE	**39.** (*c*) : MAIDEN
40. (*c*) : LUSTRE	**41.** (*b*)	**42.** (*d*)

43. (*c*) : The name of the vegetable is PUMPKIN. The last letter is N.

44. (*b*) : The name of the game is BADMINTON. The first and last letters are B and N respectively.

45. (*a*) : The word is CASUAL. The first letter is C.

46. (*b*) : The first, fourth, seventh and eleventh letters of the word SUPERFLUOUS are S, E, L and S respectively. The word formed is LESS. The first letter is L.

47. (*a*) : The sixth and fourteenth letters from the right are U and M respectively. The fifth and twentieth letters from the left are E and T respectively. Clearly, the word formed is MUTE. So, the first letter is M.

48. (*c*) : The third, fourth, fifth, seventh and tenth letters of the word PERSONALITY are R, S, O, A and T respectively. The word formed is ROAST. So, the first letter is R.

49. (*b*) : The third, fifth, eighth and tenth letters of the word DISTRIBUTE are S, R, U and E respectively. The word formed is SURE and its third letter is R.

50. (*a*) : The first, fourth, ninth and fourteenth letters of the word ADMINISTRATION are A, I, R and N respectively. The word formed is RAIN. The third letter from the right end is A.

51. (*e*) : The second, fifth and eighth letters of the word CARETAKER are A, T and E respectively. The words formed are EAT, ATE and TEA.

52. (*d*) : The first, second, fourth, fifth and sixth letters of the word 'CONTRACT' are C, O, T, R, A respectively. The word formed is ACTOR, in which the middle letter is T.

53. (*b*) : The first, fourth, fifth, seventh, tenth, eleventh and twelfth letters of the word FELICITATIONS are F, I, C, T, I, O, N respectively. The word formed is FICTION. The fifth letter from the right is C.

54. (*e*) : The fourth, eighth and tenth letters of the word COUNTERACT are N, A and T respectively. The words formed are ANT and TAN.

55. (*e*) : The first, fourth, seventh and eleventh letters of the word INTERPRETATION are I, E, R and T respectively. The words formed are TIER, RITE and TIRE.

56. (*d*) : The second, fourth, fifth and eighth letters of the word ILLOGICAL are L, O, G, A respectively. The words formed are GOAL and GAOL.

57. (*e*) : The second, fifth, tenth and twelfth letters of the word METROPOLITAN are E, O, T and N respectively. The words formed are NOTE and TONE.

58. (*e*) : The third, fifth, seventh and tenth letters of the word PROJECTION are O, E, T and N respectively. The words formed are NOTE and TONE.

59. (*e*) : The fourth, seventh, eleventh and thirteenth letters of the word CATEGORISATION are E, R, T and O respectively. The words formed are TORE and ROTE.

60. (*e*) : The first, third, seventh and ninth letters of the word SEPARATION are S, P, T and O respectively. The words formed are SPOT, POTS and TOPS.

EXERCISE 10I

Directions : ***In each of the following questions, find which one word cannot be made from the letters of the given word.***

1. CARPENTER
(*a*) NECTAR (*b*) CARPET (*c*) PAINTER (*d*) REPENT

2. TEACHERS **(I. Tax & Central Excise, 1995)**
(*a*) REACH (*b*) CHAIR (*c*) CHEER (*d*) SEARCH

3. CONSOLIDATE
(*a*) LENTIL (*b*) SLAIN (*c*) CONDOLE (*d*) DETAIL

4. UNIFORMITY **(S.S.C. 1994)**
(*a*) TINY (*b*) TORN (*c*) RENT (*d*) FORM

5. KALEIDOSCOPE
(*a*) SCALE (*b*) PADLOCK (*c*) PACKET (*d*) DIESEL

6. RECREATION **(Assistant Grade, 1994)**
(*a*) RATION (*b*) ACTION (*c*) TORN (*d*) REFER

7. SUPERIMPOSABLE
(*a*) SPIRE (*b*) REPTILE (*c*) POSSIBLE (*d*) REPOSURE

8. COMMENTATOR **(C.B.I. 1995)**
(*a*) TART (*b*) COMMON (*c*) MOMENT (*d*) COSMOS

9. MIRACULOUS
(*a*) MOLAR (*b*) LOCUS (*c*) SOLACE (*d*) SCAR

10. REASONABLE **(S.S.C. 1992)**
(*a*) BRAIN (*b*) BONES (*c*) NOBLE (*d*) ARSON

11. TRIBUNAL
(*a*) LATIN (*b*) BRAIN (*c*) URBAN (*d*) TRIBLE

12. TEMPERAMENT **(S.S.C. 1995)**
(*a*) METER (*b*) PETER (*c*) TENTER (*d*) TESTER

13. KNOWLEDGE
(*a*) WEDGE (*b*) GODOWN (*c*) KLEEN (*d*) GOLDEN

14. CONTEMPORARY **(Central Excise, 1995)**
(*a*) PARROT (*b*) COMPANY (*c*) CARPENTER (*d*) PRAYER

15. REFRIGERATE
(*a*) REFER (*b*) REGRET (*c*) REGENERATE (*d*) FREE

16. PARAPHERNALIA **(C.B.I. 1994)**
(*a*) RENAL (*b*) PRAISE (*c*) RAPHAEL (*d*) PEAR

17. OBSTETRICIAN
(*a*) SOBER (*b*) TERMITE (*c*) RETAIN (*d*) SIREN

18. UNCONSCIOUS **(S.S.C. 1994)**
(*a*) SON (*b*) COIN (*c*) SUN (*d*) NOSE

19. TURBULENCE
(*a*) CART (*b*) BLUE (*c*) RENT (*d*) LENT

20. TRANQUILITY **(S.S.C. 1994)**
(*a*) QUILT (*b*) TRINITY (*c*) TRAIN (*d*) TRIANGLE

21. INTERNATIONAL
(*a*) ORIENTAL (*b*) TERMINAL (*c*) LATTER (*d*) RATIONALE

22. ORGANISATION **(Assistant Grade, 1994)**
(*a*) NATION (*b*) GRANT (*c*) RECOGNISE (*d*) SATAN

23. VARIEGATED
(*a*) TRAVEL (*b*) TRADE (*c*) GREAT (*d*) RIGVEDA

24. DISSEMINATION **(C.B.I. 1995)**
(*a*) INDIA (*b*) NATIONS (*c*) MENTION (*d*) ACTION

25. CREDENTIAL
(*a*) DENTAL (*b*) CREATE (*c*) TRAIN (*d*) CREAM

26. REPRIMAND **(S.S.C. 1996)**
(*a*) MAIDEN (*b*) REPAIR (*c*) MUNDANE (*d*) REMAND

27. COLLABORATION
(*a*) BRITAIN (*b*) COLORATION (*c*) ROBOT (*d*) LEBARIN

28. PROGNOSTICATION **(S.S.C. 1993)**
(*a*) RONTGEN (*b*) START (*c*) SPITOON (*d*) ROGATION

29. DEPARTMENT
(*a*) ENTER (*b*) PERMIT (*c*) TEMPER (*d*) RENTED

30. DISAPPOINTMENT **(S.S.C. 1994)**
(*a*) POINT (*b*) OINTMENT (*c*) TENAMENT (*d*) POSITION

31. QUESTIONNAIRE
(*a*) QUESTOR (*b*) QUEUE (*c*) QUINATE (*d*) QUERIES

32. PHARMACEUTICAL **(C.B.I. 1995)**
(*a*) PRACTICE (*b*) METRIC (*c*) RHEUMATIC (*d*) CRITICAL

33. ADULTERATION
(*a*) RETURN (*b*) RELATION (*c*) RETAIL (*d*) TOILET

34. ENDEAVOUR **(S.S.C. 1995)**
(*a*) DROVE (*b*) DEVOUR (*c*) DROWN (*d*) ROUND

35. INTELLIGENCE
(*a*) CANCEL (*b*) INCITE (*c*) GENTLE (*d*) NEGLECT

36. THERMOLYSIS **(S.S.C. 1993)**
(*a*) LOITER (*b*) LORIS (*c*) LOTUS (*d*) SISTER

37. FLEXIGERATOR
(*a*) TAXI (*b*) GREATER (*c*) LARGER (*d*) XEROX

38. CHOREOGRAPHY **(C.B.I. 1994)**
(*a*) OGRE (*b*) PHOTOGRAPHY (*c*) GRAPH (*d*) GEOGRAPHY

39. CONSTITUTIONAL
(*a*) LOCATION (*b*) TUITION (*c*) TALENT (*d*) CONSULT

10. ETHNOGRAPHIC **(S.S.C. 1993)**
(*a*) HEART (*b*) GEAR (*c*) EARTH (*d*) GARMENT

41. TRANSLOCATION
(*a*) TALCUM (*b*) COAL (*c*) START (*d*) CARTON

42. SIGNIFICANT
(*a*) GIANT (*b*) INSIGNIA (*c*) INFANT (*d*) NASCENT

43. GERMINATION
(*a*) ORNAMENT (*b*) TERMINAL (*c*) IGNITE (*d*) NIGER

44. TOURNAMENT
(*a*) NORMAN (*b*) ROTTEN (*c*) MANOUEVRE (*d*) MANNER

45. CORRESPONDING
(*a*) DISCERN (*b*) GRINDER (*c*) DROOP (*d*) SUPERIOR

46. CHROMATOGRAPHIC
(*a*) PRAGMATIC (*b*) PHOTO (*c*) GOTHAM (*d*) MARGIN

Directions : ***In each of the following questions, choose one word which can be formed from the letters of the given word.***

47. CHOCOLATE **(I. Tax & Central Excise, 1994)**
(*a*) TELL (*b*) HEALTH (*c*) LATE (*d*) COOLER

48. MEASUREMENT **(S.S.C. 1995)**
(*a*) MASTER (*b*) MANTLE (*c*) SUMMIT (*d*) ASSURE

49. RHINOCEROS **(Central Excise, 1994)**
(*a*) RENAL (*b*) HIND (*c*) SURE (*d*) HORSE

50. RECOMMENDATION
(*a*) MEDIATE (*b*) MEDICINE (*c*) REMINDER (*d*) COMMUNICATE

51. QUINTESSENCE
(*a*) SCOT (*b*) QUOTE (*c*) QUITE (*d*) ESTEEM

52. VENTURESOME **(I. Tax, 1994)**
(*a*) ROSTRUM (*b*) SERMON (*c*) TRAVERSER (*d*) SEVENTEEN

53. CONSTANTINOPLE
(*a*) CONTINUE (*b*) CONSCIENCE (*c*) CONSTANCE (*d*) CONTENT

ANSWERS

1. (*c*)	**2.** (*b*)	**3.** (*a*)	**4.** (*c*)	**5.** (*c*)	**6.** (*d*)	**7.** (*b*)	**8.** (*d*)	**9.** (*c*)
10. (*a*)	**11.** (*d*)	**12.** (*d*)	**13.** (*b*)	**14.** (*c*)	**15.** (*c*)	**16.** (*b*)	**17.** (*b*)	**18.** (*d*)
19. (*a*)	**20.** (*d*)	**21.** (*b*)	**22.** (*c*)	**23.** (*a*)	**24.** (*d*)	**25.** (*d*)	**26.** (*c*)	**27.** (*a*)
28. (*a*)	**29.** (*b*)	**30.** (*c*)	**31.** (*b*)	**32.** (*d*)	**33.** (*a*)	**34.** (*c*)	**35.** (*a*)	**36.** (*c*)
37. (*d*)	**38.** (*b*)	**39.** (*c*)	**40.** (*d*)	**41.** (*a*)	**42.** (*d*)	**43.** (*b*)	**44.** (*c*)	**45.** (*d*)
46. (*d*)	**47.** (*c*)	**48.** (*a*)	**49.** (*d*)	**50.** (*a*)	**51.** (*c*)	**52.** (*b*)	**53.** (*d*)	

11. NUMBER, RANKING & TIME SEQUENCE TEST

TYPE 1 : NUMBER TEST

In this type of questions, generally you are given a long series of numbers. The candidate is required to find out how many times a number satisfying the conditions, specified in the question, occurs.

ILLUSTRATIVE EXAMPLES

Ex. 1. How many 5's are there in the following sequence which are immediately followed by 3 but not immediately preceded by 7 ? **(Bank P.O. 1997)**

8 9 5 3 2 5 3 8 5 5 6 8 7 3 3 5 7 7 5 3 6 5 3 3 5 7 3 8

(*a*) One (*b*) Two (*c*) Three (*d*) Four (*e*) More than four

Sol. As you know, a number which comes after a given number is said to **follow** it while the one which comes before the given number **precedes** it.

Thus, the numbers satisfying the given conditions, can be shown as follows :

8 9 [5] 3 2 [5] 3 8 5 5 6 8 7 3 3 5 7 7 5 3 6 [5] 3 3 5 7 3 8

Clearly, there are three such numbers. Hence, the answer is (*c*).

Ex. 2. How many even numbers are there in the following sequence of numbers which are immediately followed by an odd number as well as immediately preceded by an even number ? **(Bank P.O. 1995)**

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

(*a*) One (*b*) Three (*c*) Five (*d*) Six (*e*) None of these

Sol. As you know, numbers divisible by 2 are called **even** while those not divisible by 2 are called **odd** numbers.

Thus, the numbers satisfying the given conditions, can be shown as follows :

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

Clearly, there are four such numbers. Hence, the answer is (*e*).

Ex. 3. In the series,

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

how many pairs of successive numbers have a difference of 2 each ?

(*a*) 4 (*b*) 5 (*c*) 6 (*d*) 7

(C.A.T. 1997)

Sol. Clearly, the pairs of successive numbers having a difference of 2 can be shown as follows :

[6 4] 1 2 2 8 7 [4 2] 1 [5 3] [8 6] 2 1 7 1 4 [1 3] 2 [8 6]

Thus, there are six such pairs. Hence, the answer is (*c*).

Ex. 4. How many 8's are there in the following number series which are exactly divisible by its immediately preceding and also divisible by immediately succeeding numbers ?

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

(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4 (*e*) None of these

Sol. Clearly, the numbers satisfying the given conditions can be shown as follows :
8 2 4 5 1 7 2 [8] 4 [8] 4 2 2 [8] 2 6 9 8 4 5 4 8 3 2 [8] 4 3 1 8 3
Thus, there are four such 8's. Hence the answer is (*d*).

EXERCISE 11A

1. 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 (*e*) 7

2. How many 3's are there in the following sequence which are neither preceded by 6 nor immediately followed by 9 ? **(S.B.I.P.O. 1994)**
9 3 6 6 3 9 5 9 3 7 8 9 1 6 3 9 6 3 9
(*a*) One (*b*) Two (*c*) Three (*d*) Four (*e*) None of these

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 ? **(S.S.C. 1993)**
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. How many 6's are there in the following series of numbers which are preceded by 7 but not immediately followed by 9 ? **(Railways, 1994)**
6 7 9 5 6 9 7 6 8 7 6 7 8 6 9 4 6 7 7 6 9 5 7 6 3
(*a*) One (*b*) Two (*c*) Three (*d*) Four

5. How many 7's are there in the following series which are not immediately followed by 3 but immediately preceded by 8 ? **(L.I.C. 1994)**
8 9 8 7 6 2 2 6 3 2 6 9 7 3 2 8 7 2 7 7 8 7 3 7 7 9 4
(*a*) 10 (*b*) 3 (*c*) 2 (*d*) 0 (*e*) None of these

6. Count each 1 in the following sequence of numbers that is immediately followed by 2, if 2 is not immediately followed by 3. How many such 1's are there ?
1 2 1 3 4 5 1 2 3 5 2 1 2 6 1 4 5 1 1 2 4 1 2 3 2 1 7 5 2 1 2 5
(*a*) 2 (*b*) 4 (*c*) 5 (*d*) 7 (*e*) 9

7. How many 7's are there in the following series which are preceded by 6 which is not preceded by 8 ? **(B.S.R.B. 1995)**
8 7 6 7 8 6 7 5 6 7 9 7 6 1 6 7 7 6 8 8 6 9 7 6 8 7
(*a*) Nil (*b*) One (*c*) Two (*d*) Three (*e*) None of these

8. In the following list of numerals, how many 2's are followed by 1's but not preceded by 4 ? **(C.B.I. 1993)**
4 2 1 2 1 4 2 1 1 2 4 4 4 1 2 2 1 2 1 4 4 2 1 4 2 1 2 1 2 4 1 4 2 1 2 4 1 4 6
(*a*) Two (*b*) Three (*c*) Four (*d*) Five

Directions (*Questions 9-10*) : *Study the number series given below and answer the questions that follow :* **(M.B.A. 1998)**
7 8 9 7 6 5 3 4 2 8 9 7 2 4 5 9 2 9 7 6 4 7

9. How many 7's are preceded by 9 and followed by 6 ?
(*a*) 2 (*b*) 3 (*c*) 4 (*d*) 5 (*e*) None of these

10. Which figures have equal frequency ?
(*a*) 253 (*b*) 245 (*c*) 375 (*d*) 865 (*e*) None of these

11. How many 6's are there in the following number sequence which are immediately preceded by 9 but not immediately followed by 4 ? **(B.S.R.B. 1998)**

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

(*a*) One (*b*) Two (*c*) Three (*d*) Four (*e*) More than four

12. In the following series of numbers, find out how many times, 1, 3 and 7 have appeared together, 7 being in the middle and 1 and 3 on either side of 7 ?

2 9 7 3 1 7 3 7 7 1 3 3 1 7 3 8 5 7 1 3 7 7 1 7 3 9 0 6

(*a*) 3 (*b*) 4 (*c*) 5

(*d*) More than 5 (*e*) None of these **(S.B.I.P.O. 1991)**

13. In the series,

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

how many pairs of alternate numbers have a difference of 2 ? **(C.A.T. 1997)**

(*a*) One (*b*) Two (*c*) Three (*d*) Four

14. How many even numbers are there in the following sequence of numbers which are immediately followed by an odd number as well as immediately preceded by an even number ? **(Bank P.O. 1996)**

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

(*a*) One (*b*) Three (*c*) Five (*d*) Six (*e*) None of these

Directions (*Questions 15 to 17*) : *Study the following number sequence and answer the questions given below it :* **(Bank P.O. 1995)**

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

15. How many odd numbers are there in the sequence which are immediately followed by an odd number ?

(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4 (*e*) More than 4

16. How many even numbers are there in the sequence which are immediately preceded by an odd number but immediately followed by an even number ?

(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4 (*e*) More than 4

17. How many odd numbers are there in the sequence which are immediately preceded and also immediately followed by an even number ?

(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4 (*e*) More than 4

18. In the following series, how many such odd numbers are there which are divisible by 3 or 5, then followed by odd numbers and then also followed by even numbers ? **(S.B.I.P.O. 1995)**

12, 19, 21, 3, 25, 18, 35, 20, 22, 21, 45, 46, 47, 48, 9, 50, 52, 54, 55, 56

(*a*) Nil (*b*) One (*c*) Two (*d*) Three (*e*) None of these

19. In the following number sequence, how many such even numbers are there which are exactly divisible by its immediate preceding number but not exactly divisible by its immediate following number ? **(Bank P.O. 1994)**

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

(*a*) One (*b*) Two (*c*) Three (*d*) Four (*e*) None of these

20. Nitin was counting down from 32. Sumit was counting upwards the numbers starting from 1 and he was calling out only the odd numbers. What common number will they call out at the same time if they were calling out at the same speed ? **(L.I.C. 1994)**

(*a*) 19 (*b*) 21 (*c*) 22

(*d*) They will not call out the same number (*e*) None of these

21. If the first and second digits in the sequence 5 9 8 1 3 2 7 4 3 8 are interchanged, also the third and fourth digits, the fifth and sixth digits and so on, which digit would be the seventh counting to your left ? **(Bank P.O. 1997)**

(*a*) 1 (*b*) 4 (*c*) 7 (*d*) 8 (*e*) None of these

22. If the position of the first and the sixth digits of the sequence of numbers 8 9 0 3 2 1 4 6 7 5 are interchanged, the second and the seventh and so on, which number would be seventh from the right end ? **(S.B.I.P.O. 1992)**

(*a*) 2 (*b*) 6 (*c*) 7 (*d*) 8 (*e*) 9

23. The letters L, M, N, O, P, Q, R, S and T in their order are substituted by nine integers 1 to 9 but not in that order. 4 is assigned to P. The difference between P and T is 5. The difference between N and T is 3. What is the integer assigned to N ? **(I.A.S. 1994)**

(*a*) 4 (*b*) 5 (*c*) 6 (*d*) 7

24. Thirty six vehicles are parked in a parking lot in a single row. After the first car, there is one scooter. After the second car, there are two scooters. After the third car, there are three scooters and so on. Work out the number of scooters in the second half of the row. **(M.B.A. 1997)**

(*a*) 10 (*b*) 12 (*c*) 15 (*d*) 17

25. In the following sequence of instructions, 1 stands for Run, 2 stands for Stop, 3 stands for Go, 4 stands for Sit and 5 stands for Wait. If the sequence were continued, which instruction will come next ?

4 4 5 4 5 3 4 5 3 1 4 5 3 1 2 4 5 4 5 3 4 5 3

(*a*) Wait (*b*) Sit (*c*) Go (*d*) Stop (*e*) Run

26. In a school, the following codes were used during physical exercise. '1' means 'start walking', '2' means 'keep standing', '3' means 'start running at the same spot', '4' means 'sit down'. How many times will a student who performs the following sequence without error from the beginning to the end have to sit down ?

1 2 3 4 2 3 1 4 4 3 2 2 1 2 4 3 1 4 4 1 2

(*a*) 2 (*b*) 3 (*c*) 4 (*d*) 5 (*e*) None of these

27. If the numbers from 1 to 45 which are exactly divisible by 3 are arranged in ascending order, minimum number being on the top, which would come at the ninth place from the top ? **(Bank P.O. 1993)**

(*a*) 18 (*b*) 21 (*c*) 24 (*d*) 27 (*e*) 30

28. If the numbers from 5 to 85 which are exactly divisible by 5 are arranged in descending order, which would come at the eleventh place from the bottom ?

(*a*) 35 (*b*) 45 (*c*) 50 (*d*) 60 (*e*) None of these **(B.S.R.B. 1996)**

29. How many numbers from 1 to 100 are there each of which is not only exactly divisible by 4 but also has 4 as a digit ?

(*a*) 7 (*b*) 10 (*c*) 20 (*d*) 21 (*e*) More than 21

30. How many numbers amongst the numbers 9 to 54 are there which are exactly divisible by 9 but not by 3 ? **(Railways, 1995)**

(*a*) 8 (*b*) 6 (*c*) 5 (*d*) Nil

31. How many numbers from 11 to 50 are there which are exactly divisible by 7 but not by 3 ?

(*a*) Two (*b*) Four (*c*) Five (*d*) Six (*e*) Seven

32. A number is greater than 3 but less than 8. Also, it is greater than 6 but less than 10. The number is

(*a*) 5 (*b*) 6 (*c*) 7 (*d*) 8 (*e*) 9

ANSWERS

1. (*b*) : There are 27 numbers in the given sequence.
So, middle number = 14th number = 9.
Clearly, the third number to the left of this 9 is 4.

2. (*b*) : 9 [3] 6 6 3 9 5 9 [3] 7 8 9 1 6 3 9 6 3 9

3. (*a*) : 5 7 2 6 5 7 3 8 3 [7] 3 2 5 7 2 [7] 3 4 8 2 6 7 8

4. (*c*) : 6 7 9 5 6 9 7 [6] 8 7 [6] 7 8 6 9 4 6 7 7 6 9 5 7 [6] 3

5. (*c*) : 8 9 8 [7] 6 2 2 6 3 2 6 9 7 3 2 8 [7] 2 7 7 8 7 7 7 9 4

6. (*b*) : [1] 2 1 3 4 5 1 2 3 5 2 [1] 2 6 1 4 5 1 [1] 2 4 1 2 3 2 1 7 5 2 [1] 2 5

7. (*d*) : 8 7 6 [7] 8 6 7 5 6 [7] 9 7 6 [1] 6 [7] 7 6 8 8 6 9 7 6 8 7

8. (*c*) : 4 2 1 [2] 1 4 2 1 1 2 4 4 4 1 2 [2] 1 [2] 1 4 4 2 1 4 2 1 [2] 1 2 4 1 4 2 1 2 4 1 4 6

9. (*a*) : 7 8 9 [7] 6 5 3 4 2 8 9 7 2 4 5 9 2 9 [7] 6 4 7

10. (*d*) : In the given series, 2 occurs 3 times; 3 occurs once; 4 occurs 3 times; 5 occurs 2 times; 6 occurs 2 times; 7 occurs 5 times; 8 occurs 2 times and 9 occurs 4 times.
Clearly, the frequency of 5, 6 and 8 is the same *i.e.*, 2.

11. (*b*) : 5 6 4 3 2 9 [6] 3 1 6 4 9 6 4 2 1 5 9 [6] 7 2 1 4 7 4 9 6 4 2

12. (*a*) : 2 9 7 3 [1 7 3] 7 7 1 3 3 [1 7 3] 8 5 7 1 3 7 7 [1 7 3] 9 0 6

13. (*b*) : We proceed by checking the difference between pairs of alternate numbers *i.e.*, (6,1), (4,2), (1,2), (2,8), (2,7), (8,4), (7,2), (4,1), (2,5), (1,3), (5,8), (3,6), (8,2), (6,1), (2,7), (1,1), (7,4), (1,1), (4,3), (1,2), (3,8), and (2,6). Of these, the pairs with a difference of 2 are (4,2) and (1,3). Clearly, there are two such pairs.

14. (*e*) : 8 [6] 7 6 [8] 9 3 2 7 5 3 4 2 [2] 3 5 5 2 2 [8] 1 1 9

15. (*e*) : 5 1 4 [7] [3] 9 8 [5] 7 2 6 [3] [1] 5 8 6 3 8 5 2 2 4 3 4 9 6

16. (*c*) : 5 1 4 7 3 9 8 5 7 [2] 6 3 1 5 [8] 6 3 8 5 [2] 2 4 3 4 9 6

17. (*d*) : 5 1 4 7 3 9 8 5 7 2 6 3 1 5 8 6 [3] 8 [5] 2 2 4 [3] 4 [9] 6

18. (*c*) : 12, 19, 21, [3], 25, 18, 35, 20, 22, [21], 45, 46, 47, 48, 9, 50, 52, 54, 55, 56

19. (*b*) : 3 8 4 1 5 7 2 [8] 3 4 [8] 9 3 9 4 2 1 5 8 2

20. (*d*) : Nitin : 32 31 30 29 28 27 26 25 24 23 22 21 20...
Sumit : 1 3 5 7 9 11 13 15 17 19 21 23 25...
Clearly, both will never call out the same number.

21. (*d*) : The new sequence becomes 9 5 1 8 2 3 4 7 8 3.
Counting to the left, the seventh number is 8.

22. (*c*) : The new sequence becomes 1 4 6 7 5 8 9 0 3 2.
From the right end, the seventh number is 7.

23. (*c*) : $P = 4$ and $T - P = 5 \Rightarrow T = 9$.
$T - N = 3$ and $T = 9 \Rightarrow N = 6$.

24. (*c*) : Let C and S denote car and scooter respectively.
Then, the sequence of parking is
C S C S S C S S S S C S S S S S C S S S | S S C S S S S S S C S S S S S S S C
The above sequence has been divided into two equal halves by a line.
Clearly, number of scooters in second half of the row = 15.

25. (*e*) : The given sequence may be analysed as under :
4 / 45 / 453 / 4531 / 45312 / 45 / 453 / 453
Following the above sequence, the next number is 1 which stands for 'Run'.

26. (*c*) : Clearly, the student will have to sit down at the places marked by boxes :
1 2 3 [4] 2 3 1 [4 4] 3 2 2 1 2 [4] 3 1 [4 4] 1 2

27. (*d*) : The required numbers in ascending order are :
3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45.
If the minimum number *i.e.*, 3 is considered to be at the top, the ninth number from the top is 27.

28. (*e*) : The required numbers in descending order are :
85, 80, 75, 70, 65, 60, 55, 50, 45, 40, 35, 30, 25, 20, 15, 10, 5.
The eleventh number from the bottom is 55.

29. (*a*) : The numbers from 1 to 100 which are exactly divisible by 4 are 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 96, 100.
But each number should have 4 as its digit.
$\therefore$ The required numbers are 4, 24, 40, 44, 48, 64, 84. Clearly, there are 7 such numbers.

30. (*d*) : Any number divisible by 9 is also divisible by 3.

31. (*b*) : The numbers from 11 to 50, which are divisible by 7 are 14, 21, 28, 35, 42, 49. But out of these, 21 and 42 are divisible by 3.
$\therefore$ The required numbers are 14, 28, 35, 49.
Clearly, there are four such numbers.

32. (*c*) : According to first condition, the number is greater than 3 but less than 8. Such numbers are 4, 5, 6, 7.
According to the second condition, the number is greater than 6 but less than 10. Such numbers are 7, 8, 9.
Clearly, the required number is the number satisfying both the above conditions *i.e.*, 7.

TYPE 2 : RANKING TEST

In this, generally the ranks of a person both from the top and from the bottom are mentioned and the total number of persons is asked. However, sometimes this question is put in the form of a puzzle of interchanging seats by two persons.

ILLUSTRATIVE EXAMPLES

Ex. 1. Rahul ranked ninth from the top and thirty eighth from the bottom in a class. How many students are there in the class ? **(M.B.A. 1998)**
(*a*) 45 (*b*) 46 (*c*) 47 (*d*) 48

Sol. Clearly, the whole class consists of :
(*i*) 8 students who have a rank higher than Rahul;
(*ii*) Rahul; and
(*iii*) 37 students who have rank lower than Rahul.
i.e., (8 + 1 + 37) = 46 students.
Hence, the answer is (*b*).

Ex. 2. In a row of 21 girls, when Monika was shifted by four places towards the right, she became 12th from the left end. What was her earlier position from the right end of the row ?

(*a*) 9th (*b*) 10th (*c*) 11th (*d*) 12th (*e*) 14th

Sol. The change of place by Monika can be shown as under :

1 2 3 4 5 6 7 8 9 10 11 M 13 14 15 16 17 18 19 20 21

Clearly, Monika's earlier position was 8th from the left end and 14th from the right end. Hence, the answer is (*e*).

Ex. 3. In a row of boys, Deepak is seventh from the left and Madhu is twelfth from the right. If they interchange their positions, Deepak becomes twenty-second from the left. How many boys are there in the row ? **(B.S.R.B. 1996)**

(*a*) 19 (*b*) 31 (*c*) 33

(*d*) Cannot be determined (*e*) None of these

Sol. Deepak's new position is 22nd from left. But it is the same as Madhu's earlier position which is 12th from the right.

Thus, the row consists of (21 + 1 + 11) = 33 boys.

Hence, the answer is (*c*).

EXERCISE 11B

1. In a row of trees, one tree is fifth from either end of the row. How many trees are there in the row ? **(Assistant Grade, 1995)**

(*a*) 8 (*b*) 9 (*c*) 10 (*d*) 11

2. In a queue, Amrita is 10th from the front while Mukul is 25th from behind and Mamta is just in the middle of the two. If there be 50 persons in the queue, what position does Mamta occupy from the front ? **(C.A.T. 1997)**

(*a*) 20th (*b*) 19th (*c*) 18th (*d*) 17th

3. Raman ranks sixteenth from the top and forty ninth from the bottom in a class. How many students are there in the class ? **(B.S.R.B. 1998)**

(*a*) 64 (*b*) 65 (*c*) 66

(*d*) Cannot be determined (*e*) None of these

4. Sanjeev ranks seventh from the top and twenty eighth from the bottom in a class. How many students are there in the class ? **(Railways, 1998)**

(*a*) 37 (*b*) 36 (*c*) 35 (*d*) 34

5. If Atul finds that he is twelfth from the right in a line of boys and fourth from the left, how many boys should be added to the line such that there are 28 boys in the line ? **(L.I.C. 1994)**

(*a*) 12 (*b*) 13 (*c*) 14 (*d*) 20 (*e*) None of these

6. Manisha ranked sixteenth from the top and twenty ninth from the bottom among those who passed an examination. Six boys did not participate in the competition and five failed in it. How many boys were there in the class ?

(*a*) 40 (*b*) 44 (*c*) 50 (*d*) 55 (*e*) 58

(Bank P.O. 1997)

7. 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 (*e*) None of these

8. Aruna ranks twelfth in a class of forty-six. What will be her rank from the last ? **(B.S.R.B. 1997)**

(*a*) 33 (*b*) 34 (*c*) 35 (*d*) 37 (*e*) None of these

9. 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*) 20th and 24th (*b*) 24th and 20th (*c*) 25th and 21st

(*d*) 26th and 22nd (*e*) None of these

10. Ravi is 7 ranks ahead of Sumit in a class of 39. If Sumit's rank is seventeenth from the last, what is Ravi's rank from the start ? **(R.R.B.1998)**

(*a*) 14th (*b*) 15th (*c*) 16th (*d*) 17th

11. In a class of 60, where girls are twice that of boys, Kamal ranked seventeenth from the top. If there are 9 girls ahead of Kamal, how many boys are after him in rank ? **(B.S.R.B. 1995)**

(*a*) 3 (*b*) 7 (*c*) 12 (*d*) 23 (*e*) 32

12. In a row of ten boys, when Rohit was shifted by two places towards the left, he became seventh from the left end. What was his earlier position from the right end of the row ? **(S.S.C. 1995)**

(*a*) First (*b*) Second (*c*) Fourth (*d*) Sixth

13. In a queue, Vijay is fourteenth from the front and Jack is seventeenth from the end, while Mary is in between Vijay and Jack. If Vijay be ahead of Jack and there be 48 persons in the queue, how many persons are there between Vijay and Mary ? **(M.B.A. 1994)**

(*a*) 8 (*b*) 7 (*c*) 6 (*d*) 5 (*e*) None of these

14. In a row of girls, Rita and Monika occupy the ninth place from the right end and tenth place from the left end, respectively. If they interchange their places, Rita and Monika occupy seventeenth place from the right and eighteenth place from the left, respectively. How many girls are there in the row ?

(*a*) 25 (*b*) 26 (*c*) 27

(*d*) Data inadequate (*e*) None of these **(Bank P.O. 1997)**

15. In a row of girls, Shilpa is eighth from the left and Reena is seventeenth from the right. If they interchange their positions, Shilpa becomes fourteenth from the left. How many girls are there in the row ? **(B.S.R.B. 1996)**

(*a*) 25 (*b*) 27 (*c*) 29 (*d*) 32 (*e*) None of these

16. In a queue of children, Kashish is fifth from the left and Mona is sixth from the right. When they interchange their places among themselves, Kashish becomes thirteenth from the left. Then, what will be Mona's position from the right ?

(*a*) 4th (*b*) 8th (*c*) 14th (*d*) 15th

(I. Tax & Central Excise, 1995)

17. In a row of boys, Kapil is eighth from the right and Nikunj is twelfth from the left. When Kapil and Nikunj interchange positions, Nikunj becomes twenty first from the left. Which of the following will be Kapil's position from the right ?

(*a*) 8th (*b*) 17th (*c*) 21st

(*d*) Cannot be determined (*e*) None of these **(Bank P.O. 1995)**

18. Three persons A, B and C are standing in a queue. There are five persons between A and B and eight persons between B and C. If there be three persons ahead of C and 21 persons behind A, what could be the minimum number of persons in the queue ? **(Hotel Management, 1997)**

(*a*) 41 (*b*) 40 (*c*) 28 (*d*) 27

ANSWERS

1. (*b*) : Clearly, number of trees in the row = (4 + 1 + 4) = 9.

2. (*c*) : Number of persons between Amrita and Mukul = 50 – (10 + 25) = 15.
Since Mamta lies in middle of these 15 persons, so Mamta's position is 8th from Amrita *i.e.* 18th from the front.

3. (*a*) : Clearly, number of students in the class = (15 + 1 + 48) = 64.

4. (*d*) : Clearly, number of students in the class = (6 + 1 + 27) = 34.

5. (*b*) : Clearly, number of boys in the line = (11 + 1 + 3) = 15.
∴ Number of boys to be added = 28 – 15 = 13.

6. (*d*) : Number of boys who passed = (15 + 1 + 28) = 44.
∴ Total number of boys in the class = 44 + 6 + 5 = 55.

7. (*a*) : Number of boys in the row
= number of boys uptil P + number of boys between P and Q
+ number of boys including Q and those behind Q
= 14 + 4 + 7 = 25.

8. (*c*) : Number of students behind Aruna in rank = (46 – 12) = 34.
So, Aruna is 35th from the last.

9. (*c*) : Number of students behind Manoj in rank = (31 – 7) = 24.
So, Manoj is 25th from the bottom.
Number of students behind Sachin in rank = (31 – 11) = 20.
So, Sachin is 21st from the bottom.

10. (*c*) : Sumit is 17th from the last and Ravi is 7 ranks ahead of Sumit. So, Ravi is 24th from the last.
Number of students ahead of Ravi in rank = (39 – 24) = 15.
So, Ravi is 16th from the start.

11. (*c*) : Let the number of boys be x. Then, number of girls = $2x$.
∴ $x + 2x = 60$ or $3x = 60$ or $x = 20$.
So, number of boys = 20 and number of girls = 40.
Number of students behind Kamal in rank = (60 – 17) = 43.
Number of girls ahead of Kamal in rank = 9.
Number of girls behind Kamal in rank = 40 – 9 = 31.
∴ Number of boys behind Kamal in rank = 43 – 31 = 12.

12. (*b*) : Number of boys in the row = 10.
Rohit's new position is 7th from the left or 4th from the right.
His earlier position was two places to the right of his new position *i.e.*, his earlier position was second from the right.

13. (*a*) : Number of persons between Vijay and Jack = 48 – (14 + 17) = 17.
Now, Mary lies in middle of these 17 persons *i.e.*, at the eighth position.
So, number of persons between Vijay and Mary = 7.

14. (*b*) : Since Rita and Monika exchange places, so Rita's new position is the same as Monika's earlier position.
This position is 17th from the right and 10th from the left.
∴ Number of girls in the row = (16 + 1 + 9) = 26.

15. (*e*) : Since Shilpa and Reena interchange positions, so Shilpa's new position is the same as Reena's earlier position.
This position is 14th from the left (Shilpa's new position) and 17th from the right (Reena's earlier position).
∴ Number of girls in the row = (13 + 1 + 16) = 30.

16. (*c*) : Since Kashish and Mona interchange places, so Kashish's new position (13th from left) is the same as Mona's earlier position (6th from right).
So, number of children in the queue = (12 + 1 + 5) = 18.
Now, Mona's new position is the same as Kashish's earlier position *i.e.*, fifth from left.
∴ Mona's position from the right = (18 – 4) = 14th.

17. (*b*) : Since Kapil and Nikunj interchange places, so Nikunj's new position (21st from left) is the same as Kapil's earlier position (8th from right).
So, number of boys in the row = (20 + 1 + 7) = 28.
Now, Kapil's new position is the same as Nikunj's earlier position *i.e.*, 12th from left.
∴ Kapil's position from the right = (28 – 11) = 17th.

18. (*c*) : Three persons A, B, C can be arranged in a queue in six different ways *i.e.*, ABC, CBA, BAC, CAB, BCA, ACB. But since there are only 3 persons ahead of C, so C should be in front of the queue. Thus, there are only two possible arrangements *i.e.*, CBA and CAB. We may consider the two cases as under :

Case I : $\overset{3}{\longleftarrow}$ C $\overset{8}{\longleftrightarrow}$ B $\overset{5}{\longleftrightarrow}$ A $\overset{21}{\longrightarrow}$

Clearly, number of persons in the queue = (3 + 1 + 8 + 1 + 5 + 1 + 21) = 40.

Case II : $\overset{3}{\longleftarrow}$ C A $\overset{5}{\longleftrightarrow}$ B

$\overset{8}{\longleftrightarrow}$

$\overset{21}{\longrightarrow}$

Number of persons between A and C = (8 – 6) = 2.
Clearly, number of persons in the queue = (3 + 1 + 2 + 1 + 21) = 28.
Now, 28 < 40. So, 28 is the minimum number of persons in the queue.

TYPE 3 : TIME SEQUENCE TEST

Ex. 1. Satish remembers that his brother's birthday is after fifteenth but before eighteenth of February whereas his sister Kajal remembers that her brother's birthday is after sixteenth but before nineteenth of February. On which day in February is Satish's brother's birthday ? **(Bank P.O. 1996)**

(*a*) 16th (*b*) 17th (*c*) 18th (*d*) 19th (*e*) None of these

Sol. According to Satish, the brother's birthday is on one of the days among 16th and 17th February.
According to Kajal, the brother's birthday is on one of the days among 17th and 18th February.
Clearly, Satish's brother's birthday is on the day common to both the above groups *i.e.*, 17th February.
Hence, the answer is (*b*).

Ex. 2. A bus for Delhi leaves every thirty minutes from a bus stand. An enquiry clerk told a passenger that the bus had already left ten minutes ago and the next bus will leave at 9.35 a.m. At what time did the enquiry clerk give this information to the passenger ?

(*a*) 9.10 a.m. (*b*) 8.55 a.m. (*c*) 9.08 p.m.
(*d*) 9.05 a.m. (*e*) 9.15 a.m.

Sol. The next bus will leave at 9.35 a.m. This means that the previous bus had left at 9.05 a.m. But it happened ten minutes before the clerk gave the information to the passenger.

Thus, the enquiry clerk gave the information at 9.15 a.m.

Hence, the answer is (*e*).

Ex. 3. If the seventh day of a month is three days earlier than Friday, what day will it be on the nineteenth day of the month ? **(C.B.I. 1994)**

(*a*) Sunday (*b*) Monday (*c*) Wednesday (*d*) Friday

Sol. As mentioned, the seventh day of the month is three days earlier than Friday, which is Tuesday.

So, the fourteenth day is also Tuesday and thus, the nineteenth day is Sunday.

Hence, the answer is (*a*).

Ex. 4. If it was Saturday on 17th December, 1982 what will be the day on 22nd December, 1984 ? **(R.R.B. 1998)**

(*a*) Monday (*b*) Tuesday (*c*) Wednesday (*d*) Sunday

Sol. Clearly, every day repeats itself on the seventh day. Now, 17th Dec. 1982-17th Dec. 1983 is a period of 365 days. Dividing by 7, we get 52 weeks and one day. Thus, the 365th day will be the same as the first day *i.e.*, 16th Dec. 1983 is also Saturday.

Now, 16th Dec, 1983-16th Dec, 1984 is a period of 366 days (because 1984, being a leap year, has 29 days in February). Thus, as shown above, 14th Dec. 1984 will be the same as 16th Dec. 1983 *i.e.*, Saturday. So, 21st Dec. 1984 is also Saturday and thus, 22nd Dec. 1984 is a Sunday.

Hence, the answer is (*d*).

Note : For such questions as Ex. 4, remember

(*i*) A year has 365 days.

(*ii*) Years, divisible by 4, are leap years *e.g.*, 1980, 1984, 1988, 1992, 1996,... They have 366 days.

(*iii*) February in a leap year has 29 days.

(*iv*) The last day of a year is the same as first day.

Thus, if the first day of a year is Friday, then the last day of the year is Friday and the first day of the next year is Saturday.

However, if the first day of a leap year is Friday, then the last day of the year is Saturday and the first day of the next year is Sunday.

EXERCISE 11C

1. Kailash remembers that his brother Deepak's birthday falls after 20th May but before 28th May, while Geeta remembers that Deepak's birthday falls before 22nd May but after 12th May. On what date Deepak's birthday falls ?

(*a*) 20th May (*b*) 21st May (*c*) 22nd May

(*d*) Cannot be determined (*e*) None of these

2. Sangeeta remembers that her father's birthday was certainly after eighth but before thirteenth of December. Her sister Natasha remembers that their father's birthday was definitely after ninth but before fourteenth of December. On which date of December was their father's birthday ? **(Bank P.O. 1998)**

(*a*) 10th (*b*) 11th (*c*) 12th
(*d*) Data inadequate (*e*) None of these

3. Standing on a platform, Amit told Sunita that Aligarh was more than ten kilometres but less than fifteen kilometres from there. Sunita knew that it was more than twelve but less then fourteen kilometres from there. If both of them were correct, which of the following could be the distance of Aligarh from the platform ? **(B.S.R.B. 1997)**

(*a*) 11 km (*b*) 12 km (*c*) 13 km (*d*) 14 km (*e*) 15 km

4. Ashish leaves his house at 20 minutes to seven in the morning, reaches Kunal's house in 25 minutes, they finish their breakfast in another 15 minutes and leave for their office which takes another 35 minutes. At what time do they leave Kunal's house to reach their office ? **(Bank P.O. 1997)**

(*a*) 7.40 a.m. (*b*) 7.20 a.m. (*c*) 7.45 a.m. (*d*) 8.15 a.m. (*e*) 7.55 a.m.

5. Ajay left home for the bus stop 15 minutes earlier than usual. It takes 10 minutes to reach the stop. He reached the stop at 8.40 a.m. What time does he usually leave home for the bus stop ? **(L.I.C. 1994)**

(*a*) 8.30 a.m. (*b*) 8.45 p.m. (*c*) 8.55 a.m.
(*d*) Data inadequate (*e*) None of these

6. Reaching the place of meeting on Tuesday 15 minutes before 08.30 hours, Anuj found himself half an hour earlier than the man who was 40 minutes late. What was the scheduled time of the meeting ? **(S.S.C. 1996)**

(*a*) 8.00 hrs (*b*) 8.05 hrs (*c*) 8.15 hrs (*d*) 8.45 hrs

7. The priest told the devotee, "The temple bell is rung at regular intervals of 45 minutes. The last bell was rung five minutes ago. The next bell is due to be rung at 7.45 a.m." At what time did the priest give this information to the devotee ? **(B.S.R.B. 1996)**

(*a*) 7.40 a.m. (*b*) 7.05 a.m. (*c*) 7.00 a.m.
(*d*) 6.55 a.m. (*e*) None of these

8. The train for Lucknow leaves every two and a half hours from New Delhi Railway Station. An announcement was made at the station that the train for Lucknow had left 40 minutes ago and the next train will leave at 18.00 hrs. At what time was the announcement made ?

(*a*) 15.30 hrs (*b*) 17.10 hrs (*c*) 16.00 hrs
(*d*) 15.50 hrs (*e*) None of these

9. An application was received by inward clerk in the afternoon of a week day. Next day he forwarded it to the table of the senior clerk, who was on leave that day. The senior clerk next day evening put up the application to the desk officer. Desk officer studied the application and disposed off the matter on the same day *i.e.*, Friday. Which day was the application received by the inward clerk ?

(*a*) Monday (*b*) Tuesday (*c*) Wednesday
(*d*) Earlier week's Saturday (*e*) None of these **(Bank P.O. 1997)**

10. There are twenty people working in an office. The first group of five works between 8.00 A.M. and 2.00 P.M. The second group of ten works between 10.00 A.M. and 4.00 P.M. And the third group of five works between 12 noon and 6.00 P.M. There are three computers in the office which all the employees frequently use. During which of the following hours the computers are likely to be used most ? **(C.B.I. 1995)**

(*a*) 10.00 A.M. — 12 noon (*b*) 12 noon — 2.00 P.M.
(*c*) 1.00 P.M. — 3.00 P.M. (*d*) 2.00 P.M. — 4.00 P.M.

11. A monkey climbs 30 feet at the beginning of each hour and rests for a while when he slips back 20 feet before he again starts climbing in the beginning of the next hour. If he begins his ascent at 8.00 a.m., at what time will he first touch a flag at 120 feet from the ground ? **(M.B.A. 1997)**

(*a*) 4 p.m. (*b*) 5 p.m. (*c*) 6 p.m. (*d*) None of these

Directions (*Questions 12 to 14*) : *Study the following information carefully and answer the questions given below it :* **(S.B.I.P.O. 1997)**

(I) Kamal is available at home from 12 noon to 4 p.m. on Tuesday, Thursday and Sunday.

(II) His younger brother Navin is available at home on Monday, Thursday, Friday and Sunday between 10 a.m. to 2 p.m.

(III) The eldest brother Rajiv is available between 9 a.m. to 12 noon on Monday, Wednesday and Thursday and 2 p.m. to 4 p.m. on Friday, Saturday and Sunday.

12. At a time, on which day of a week all the three brothers are available at home ?

(*a*) None (*b*) Sunday (*c*) Thursday
(*d*) Cannot be determined (*e*) None of these

13. For how many days only one brother is available at a particular time in a week ?

(*a*) One (*b*) Two (*c*) Three (*d*) Four (*e*) None of these

14. On which day(s) of a week, the youngest and the eldest brothers are available at home at the same time ?

(*a*) Only Monday (*b*) Only Thursday (*c*) Only Friday
(*d*) Both Monday and Thursday (*e*) Both Sunday and Friday

15. If the day before yesterday was Thursday, when will Sunday be ?

(*a*) Today (*b*) Two days after today
(*c*) Tomorrow (*d*) Day after tomorrow **(Section Officers' 1993)**

16. If the day before yesterday was Saturday, what day will fall on the day after tomorrow ? **(C.B.I. 1993)**

(*a*) Friday (*b*) Thursday (*c*) Wednesday (*d*) Tuesday

17. Mohini went to the movies nine days ago. She goes to the movies only on Thursday. What day of the week is today ? **(Railways, 1994)**

(*a*) Thursday (*b*) Saturday (*c*) Sunday (*d*) Tuesday

18. If the third day of a month is Monday, which of the following will be the fifth day from 21st of the month ?

(*a*) Monday (*b*) Tuesday (*c*) Wednesday
(*d*) Thursday (*e*) None of these

19. 1.12.91 is the first Sunday. Which is the fourth Tuesday of December 91 ?

(*a*) 17.12.91 (*b*) 24.12.91 (*c*) 26.12.91 (*d*) 31.12.91 **(C.B.I. 1994)**

20. If Thursday was the day after the day before yesterday five days ago, what is the least number of days ago when Sunday was three days before the day after tomorrow ? **(Railways, 1994)**

(*a*) Two (*b*) Three (*c*) Four (*d*) Five

21. If the 25th of August in a year is Thursday, the number of Mondays in that month is **(S.S.C. 1996)**

(*a*) 3 (*b*) 4 (*c*) 5 (*d*) 6

22. If 1st October is Sunday, then 1st November will be **(C.A.T. 1997; R.R.B. 1998)**

(*a*) Monday (*b*) Tuesday (*c*) Wednesday (*d*) Thursday

23. If 3rd December, 1990 is Sunday, what day is 3rd January, 1991 ? **(S.S.C. 1994)**

(*a*) Tuesday (*b*) Wednesday (*c*) Thursday (*d*) Friday

24. If February 1, 1996 is Wednesday, what day is March 3, 1996 ? **(M.B.A. 1996)**

(*a*) Monday (*b*) Sunday (*c*) Saturday (*d*) Friday

25. If the first day of the year (other than the leap year) was Friday, then which was the last day of that year ? **(S.S.C. 1996)**

(*a*) Monday (*b*) Friday (*c*) Saturday (*d*) Sunday

26. If 18th February, 1997 falls on Tuesday then what will be the day on 18th February, 1999 ? **(Railways, 1998)**

(*a*) Monday (*b*) Tuesday (*c*) Thursday (*d*) Friday

27. How many days will there be from 26th January, 1996 to 15th May, 1996 (both days included) ?

(*a*) 110 (*b*) 111 (*c*) 112 (*d*) 113 (*e*) None of these

28. Which two months in a year have the same calendar ?

(*a*) June, October (*b*) April, November

(*c*) April, July (*d*) October, December

ANSWERS

1. (*b*) : According to Kailash, Deepak's birthday falls on one of the days among 21st, 22nd, 23rd, 24th, 25th, 26th and 27th May.

According to Geeta, Deepak's birthday falls on one of the days among 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th and 21st May.

The day common to both the groups is 21st May.

∴ Deepak's birthday falls on 21st May.

2. (*d*) : According to Sangeeta, the father's birthday falls on one of the days among 9th, 10th, 11th and 12th December. According to Natasha, the father's birthday falls on one of the days among 10th, 11th, 12th and 13th December.

The days common to both the groups are 10th, 11th and 12th December. So, the father's birthday falls on any one of these days.

3. (*c*) : Clearly, according to Sunita, the distance was more than 12 kms but less than 14 kms, which is 13 kms.

4. (*b*) : Ashish leaves his house at 6.40 a.m.

He reaches Kunal's house in 25 minutes *i.e.*, at 7.05 a.m.

Both leave for office 15 minutes after 7.05 a.m. *i.e.*, at 7.20 a.m.

5. (*e*) : Clearly, Ajay left home 10 minutes before 8.40 a.m. *i.e.*, at 8.30 a.m. But it was 15 minutes earlier than usual. So, he usually left for the stop at 8.45 a.m.

6. (*b*) : Anuj reached the place at 08.15 hours.

Clearly, the man who was 40 minutes late would reach the place at 08.45 hours.

So, the scheduled time of the meeting was 08.05 hours.

7. (*b*) : Clearly, the last bell rang 45 minutes before 7.45 a.m. *i.e.*, at 7.00 a.m. But it happened five minutes before the priest gave the information to the devotee. So, the information was given at 7.05 a.m.

8. (*e*) : Clearly, the last train left two and a half hours before 18.00 hours *i.e.* at 15.30 hours. But this happened 40 minutes before the announcement was made. So, the announcement was made at 16.10 hours.

9. (*c*) : Desk officer received the application on Friday.
Clearly, the application was forwarded to the table of the senior clerk on Thursday.
So, the application was received by the inward clerk on Wednesday.

10. (*b*) : Clearly, the computers would be used most when all the three groups are working simultaneously and this happens during the period 12 noon to 2 p.m.

11. (*c*) : Clearly, the monkey climbs 10 feet in one hour.
So, it will climb upto a height of 90 feet in 9 hours *i.e.*, at 5.00 p.m. It will then ascend a height of 30 feet in the next hour to touch the peak at 6.00 p.m.

Questions 12-14

We prepare a table as under :

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
9 a.m. to 10 a.m.	R		R	R			
10 a.m. to 12 noon	N, R		R	N, R	N		N
12 noon to 2 p.m.	N	K		K, N	N		K, N
2 p.m. to 4 p.m.		K		K	R	R	K, R

12. (*a*) : Clearly, all the three brothers are not available at the same time on any day of the week.

13. (*d*) : Clearly, one brother is available at a particular time on all seven days of the week.

14. (*d*) : Clearly, Navin and Rajiv are available at home at the same time on Monday and Thursday.

15. (*c*) : If day before yesterday was Thursday, so today is Saturday.
∴ Tomorrow will be Sunday.

16. (*c*) : If day before yesterday was Saturday, so today is Monday.
Thus, tomorrow will be Tuesday and day after tomorrow will be Wednesday.

17. (*b*) : Clearly, nine days ago, it was Thursday.
∴ Today is Saturday.

18. (*c*) : The 3rd day is Monday. So, the 10th and 17th days are also Mondays.
Thus, the 21st day is Friday.
∴ The fifth day from the 21st will be Wednesday.

19. (*b*) : 1.12.91 is the first Sunday of December 91.
So, 3.12.91 is the first Tuesday of the month.
Clearly, 10.12.91, 17.12.91, 24.12.91 and 31.12.91 are also Tuesdays.
So, 24.12.91 is the fourth Tuesday.

20. (*a*) : Day after the day before yesterday is yesterday.
Now, five days ago, yesterday was Thursday.
So, five days ago, it was Friday.
∴ Today is Wednesday.
Now, three days before the day after tomorrow is yesterday.
Now, it is on Monday that we say 'Yesterday was Sunday'.

21. (*c*) : 25th August is a Thursday.
So, 22nd August is a Monday.
So, Mondays fall on 1st, 8th, 15th, 22nd and 29th of August.
Thus, there are five Mondays.

22. (*c*) : Clearly 1st, 8th, 15th, 22nd, and 29th October are Sundays.
So, 31st October is Tuesday.
∴ 1st November will be Wednesday.

23. (*b*) : Clearly, 3rd, 10th, 17th, 24th and 31st December 1990 are Sundays.
So, 1st January 1991 is Monday and 3rd January 1991 is Wednesday.

24. (*c*) : 1996 is a leap year and so February has 29 days.
Now, 1st, 8th, 15th, 22nd and 29th February are Wednesdays.
So, 1st March is Thursday and 3rd March is Saturday.

25. (*b*) : If the year is not a leap year, then the last day of the year is the same as the first day.

26. (*c*) : 18th February, 1997 was Tuesday.
So, 18th February, 1998 was Wednesday.
∴ 18th February, 1999 will be Thursday.

27. (*b*) : Number of days = (6 + 29 + 31 + 30 + 15) = 111.
Note : 1988 is a leap year. So, number of days in February = 29.

28. (*c*) : Two months will have the same calendar if the period between them is divisible by 7. Now,

(*a*) June + July + Aug. + Sep. = 30 + 31 + 31 + 30 = 122 (not divisible by 7)

(*b*) Apr. + May + June + July + Aug. + Sep. + Oct.
= 30 + 31 + 30 + 31 + 31 + 30 + 31
= 213 (not divisible by 7)

(*c*) Apr. + May + June = 30 + 31 + 30 = 91 (divisible by 7)

(*d*) October + November = 31+ 30 = 61 (not divisible by 7)

12. MATHEMATICAL OPERATIONS

This section deals with questions on simple mathematical operations. Here, the four fundamental operations — addition, subtraction, multiplication and division and also statements such as 'less than', 'greater than', 'equal to', 'not equal to', etc. are represented by symbols, different from the usual ones. The questions involving these operations are set using artificial symbols. The candidate has to substitute the real signs and solve the questions accordingly, to get the answer.

TYPE 1 : PROBLEM-SOLVING BY SUBSTITUTION

In this type, you are provided with substitutes for various mathematical symbols, followed by a question involving calculation of an expression or choosing the correct/ incorrect equation. The candidate is required to put in the real signs in the given equation and then solve the questions as required.

Note : While solving a mathematical expression, proceed according to the rule BODMAS — *i.e.*, **B**rackets, **O**f, **D**ivision, **M**ultiplication, **A**ddition, **S**ubtraction.

e.g., $(36 - 12) \div 4 + 6 \div 2 \times 3 = 24 \div 4 + 6 \div 2 \times 3$ (Solving Bracket)
$= 6 + 3 \times 3$ (Solving Division)
$= 6 + 9$ (Solving Multiplication)
$= 15$ (Solving Addition)

ILLUSTRATIVE EXAMPLES

Ex. 1. If '+' means 'divided by', '–' means 'multiplied by', '×' means 'minus' and '÷' means 'plus', which of the following will be the value of the expression $16 \div 8 - 4 + 2 \times 4$? **(Bank P.O. 1995)**

(*a*) 16 (*b*) 28 (*c*) 32 (*d*) 44 (*e*) None of these

Sol. Putting the proper signs in the given expression, we get :
$16 + 8 \times 4 \div 2 - 4 = 16 + 8 \times 2 - 4 = 16 + 16 - 4 = 32 - 4 = 28.$
So, the answer is (*b*).

Ex. 2. If + means ÷, – means ×, ÷ means + and × means –, then $36 \times 12 + 4 \div 6 + 2 - 3 = ?$

(*a*) 2 (*b*) 18 (*c*) 42 (*d*) $6\frac{1}{2}$ (*e*) None of these

Sol. Using the proper signs, we get :
$36 - 12 \div 4 + 6 \div 2 \times 3 = 36 - 3 + 3 \times 3 = 36 - 3 + 9 = 45 - 3 = 42.$
So, the answer is (*c*).

Ex. 3. If A means 'plus', B means 'minus', C means 'divided by' and D means 'multiplied by', then 18 A 12 C 6 D 2 B 5 = ? **(B.S.R.B. 1996)**

(*a*) 15 (*b*) 25 (*c*) 27 (*d*) 45 (*e*) None of these

Sol. Using the proper signs, we get :
Given expression $= 18 + 12 \div 6 \times 2 - 5 = 18 + 2 \times 2 - 5$
$= 18 + 4 - 5 = 22 - 5 = 17.$
So, the answer is (*e*).

Ex. 4. If × stands for −, ÷ stands for +, + stands for ÷ and − stands for ×, which one of the following equations is correct ? **(S.S.C. 1996)**

(*a*) $15 - 5 \div 5 \times 20 + 10 = 6$ (*b*) $8 \div 10 - 3 + 5 \times 6 = 8$

(*c*) $6 \times 2 + 3 \div 12 - 3 = 15$ (*d*) $3 \div 7 - 5 \times 10 + 3 = 10$

Sol. Using the proper signs, we get :

Expression in (*a*) $= 15 \times 5 + 5 - 20 \div 10 = 15 \times 5 + 5 - 2 = 75 + 5 - 2 = 78.$

Expression in (*b*) $= 8 + 10 \times 3 \div 5 - 6 = 8 + 10 \times \frac{3}{5} - 6 = 8 + 6 - 6 = 8.$

Expression in (*c*) $= 6 - 2 \div 3 + 12 \times 3 = 6 - \frac{2}{3} + 36 = 42 - \frac{2}{3} = \frac{124}{3}.$

Expression in (*d*) $= 3 + 7 \times 5 - 10 \div 3 = 3 + 7 \times 5 - \frac{10}{3} = 3 + 35 - \frac{10}{3} = \frac{104}{3}.$

$\therefore$ Statement (*b*) is true.

Ex. 5. It being given that : > denotes +, < denotes −, + denotes ÷, − denotes =, = denotes 'less than' and × denotes 'greater than', find which of the following is a correct statement.

(*a*) $3 + 2 > 4 = 9 + 3 < 2$ (*b*) $3 > 2 > 4 = 18 + 3 < 1$

(*c*) $3 > 2 < 4 \times 8 + 4 < 2$ (*d*) $3 + 2 < 4 \times 9 + 3 < 3$

Sol. Using proper notations, we have :

(*a*) Given statement is $3 \div 2 + 4 < 9 \div 3 - 2$ or $\frac{11}{2} < 1$, which is not true.

(*b*) Given statement is $3 + 2 + 4 < 18 \div 3 - 1$ or $9 < 5$, which is not true.

(*c*) Given statement is $3 + 2 - 4 > 8 \div 4 - 2$ or $1 > 0$, which is true.

(*d*) Given statement is $3 \div 2 - 4 > 9 \div 3 - 3$ or $-\frac{5}{2} > 0$, which is not true.

So, the statement (*c*) is true.

EXERCISE 12A

1. If × stands for 'addition', ÷ stands for 'subtraction', + stands for 'multiplication' and − stands for 'division', then

$20 \times 8 \div 8 - 4 + 2 = ?$ **(Transmission Executives' 1994)**

(*a*) 80 (*b*) 25 (*c*) 24 (*d*) 5

2. If − means ×, × means +, + means ÷ and ÷ means −, then

$40 \times 12 + 3 - 6 \div 60 = ?$ **(Bank P.O. 1993)**

(*a*) 7.95 (*b*) 16 (*c*) 44 (*d*) 479.95 (*e*) None of these

3. If + means ÷, × means −, ÷ means × and − means +, then

$8 + 6 \times 4 \div 3 - 4 = ?$ **(Bank P.O. 1994)**

(*a*) − 12 (*b*) $-\frac{20}{3}$ (*c*) 12 (*d*) $\frac{20}{3}$ (*e*) None of these

4. If × means ÷, − means ×, ÷ means + and + means −, then

$(3 - 15 \div 19) \times 8 + 6 = ?$ **(Assistant Grade, 1998)**

(*a*) 8 (*b*) 4 (*c*) 2 (*d*) − 1

5. If + means ×, ÷ means −, × means ÷ and − means +, what will be the value of $4 + 11 \div 5 - 55 = ?$ **(L.I.C. 1994)**

(*a*) − 48.5 (*b*) − 11 (*c*) 79 (*d*) 91 (*e*) None of these