CHAPTER – 3

DISTRIBUTIONS

In this type of problems, you have to match two or more "variables" [Variable means a "subject" as used in the discussion of Linear Arrangement]. In double line-up, the data given may talk of four people living in four houses each of a different colour. What we need to find out is the colour of the house of each of the four persons. There is no first position or second position of the houses.

Sometimes, Double line-up is also called as "Distribution." An example of data given for this variety of questions is:

"Each of the four persons A, B, C and D wears a different coloured shirt – Red, Pink, Blue and White. A has a Red shirt and D does not have a Pink shirt."

From the above statement, it becomes clear that no person among A, B, C and D can have shirts of two different colours among Red, Pink, Blue and White.

As discussed in the questions on Single Line-up, questions can be solved easily by representing the given data pictorially. In case of Double Line-up, it will help us if we represent the data in the form of a matrix or a table.

Let us see how to draw a matrix for the data given above.

	Colours			
Names	Red	Pink	Blue	White
A	✓			
B				
C				
D		×		

As it is given that A has red colour shirt, it is clear that he does not have any other colour shirt. Similarly B, C, D do not Red colour shirt. So, in all the other cells in the row belonging to A, we put a cross ('×'). Then, the table will look as follows:

	Colours			
Names	Red	Pink	Blue	White
A	✓	×	×	×
B	×			
C	×			
D	×	×		

In this manner, we can fill up the cells on the basis of the data given to us. Once, we use up all the data, we will draw any conclusions that can be drawn and then answer the questions given in the set.
Let us take a few examples.

Directions for questions 1 to 5: These questions are based on the following information.

P, Q, R, S, T, U, V and W are eight employees of a concern. Each is allotted a different locker, out of eight lockers numbered 1 to 8 in a cupboard. The lockers are arranged in four rows with two lockers in each row.

Lockers 1 and 2 are in the top row from left to right respectively while lockers 7 and 8 are in the bottom row – arranged from left to right respectively. Lockers 3 and 4 are in the second row from the top – arranged from right to left respectively. So are lockers 5 and 6 – arranged from right to left respectively – in the second row from the bottom. P has been allotted locker 1 while V has been allotted locker 8. T's locker is just above that of Q which is just above that of R, whereas W's locker is in the bottom row.

1. Which of the following cannot be the correct locker number–occupant pair?
(A) 3-Q (B) 7-W (C) 4-U (D) 6-R

2. If U's locker is not beside Q's locker, whose locker is just above that of W?
(A) U (B) S (C) R (D) Q

3. Which of these pairs cannot have lockers that are diagonally placed?
(A) P-Q (B) S-R
(C) U-R (D) Either (B) or (C)

4. Which of the following groups consists only occupants of odd numbered lockers?
(A) Q, R, W (B) R, V, W
(C) T, R, Q (D) P, T, Q

5. If U's locker is in the same row as that of R, and S exchanges his locker with V, then who is the new neighbour of V in the same row? (Assume that nothing else is disturbed from the original arrangement)
(A) P (B) Q (C) R (D) U

Solutions for questions 1 to 5:

Let us first try to locate the lockers in the cupboard as per the conditions given. Then, we will do the allotment to the persons.

Lockers 1 and 2 are in the top row and lockers 7 and 8 are in the bottommost row. In these two rows, the lockers are numbered from left to right. In the other two rows, the lockers are numbered from right to left.

L	R	
1	2	Top Row
4	3	
6	5	
7	8	Bottom Row

Now let us look at the conditions given for the allotment of the lockers.

P has locker 1. V has locker 8.

1-P	2
4	3
6	5
7	8-V

Locker of W is in the bottom row ➔ W's locker must be 7.

1-P	2
4	3
6	5
7-W	8-V

T's locker is just above that of Q, which is just above that of R ➔ The lockers of T, Q and R must be 2, 3 and 5

respectively (there are no other group of lockers which satisfy this condition).

1-P	2-T
4	3-Q
6	5-R
7-W	8-V

S and U have lockers 4 and 6 left for them.

Thus, on the basis of the data given to us, we can show the final arrangement of lockers as below:

1-P	2-T
4-S/U	3-Q
6-U/S	5-R
7-W	8-V

Now we can answer the questions easily on the basis of the above.

1. By looking at the final arrangement of lockers above, we find that choice (D) does not represent the correct combination of locker number-occupant pair.
Choice (D)

2. If U's locker is not beside Q's locker, then U's locker must be locker 6. So, it is U's locker that will be immediately above W's. Choice (A)

3. R's locker is in the same row as that of exactly one of S or U and diagonally placed to the other one. Hence, "either S-R or U-R" is the answer. Choice (D)

4. The odd-numbered lockers 1, 3, 5 and 7 which belong to P, Q, R and W respectively. Of the choices, we find that Q, R, W appear in choice (A). Hence, this is the correct choice. Choice (A)

5. U's locker is in the same row as that of R which means that locker 6 belongs to U. So locker 4 belongs to S. Now V and S exchange lockers. Then the new neighbour of V is Q. Choice (B)

Directions for questions 6 to 9: These questions are based on the following information.

There are four trees – Lemon, Coconut, Mango and Neem – each at a different corner of a rectangular plot. A well is located at one corner and a cabin at another corner. Lemon and Coconut trees are on either side of the Gate which is located at the centre of the side opposite to the side at whose extremes, the well and the cabin are located. The mango tree is not at the corner where the cabin is located.

6. Which of the following pairs can be diagonally opposite to each other in the plot?
(A) Neem tree and Lemon tree
(B) Cabin and Neem tree
(C) Mango tree and Well
(D) Coconut tree and Lemon tree

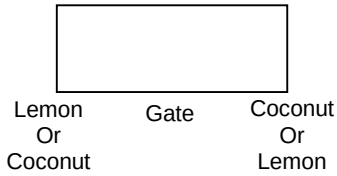
7. If the Lemon Tree is diagonally opposite to the well, then the Coconut tree is diagonally opposite to the
(A) Mango tree. (B) Well.
(C) Cabin. (D) Gate.

8. If the Coconut tree and the Neem tree cannot be at adjacent corners of the plot, then which of the following will necessarily have to be at diagonally opposite corners of the plot?
(A) Coconut tree and Well
(B) Lemon tree and Cabin
(C) Lemon tree and Coconut tree
(D) Lemon tree and Well

9. Which of the following is definitely FALSE?
(A) Mango Tree is adjacent to the well at one corner.
(B) Neem Tree is adjacent to the Cabin at one corner.
(C) Coconut Tree is at the corner adjacent to the Well.
(D) Lemon Tree is not on the same side of the plot as the gate.

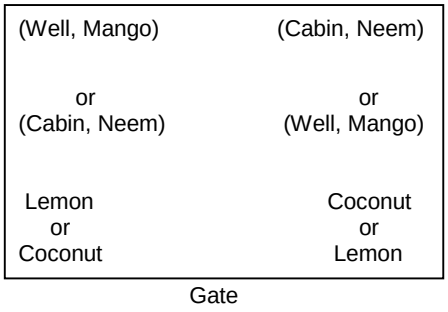
Solutions for questions 6 to 9:

Lemon and Coconut are on either sides of the gate.



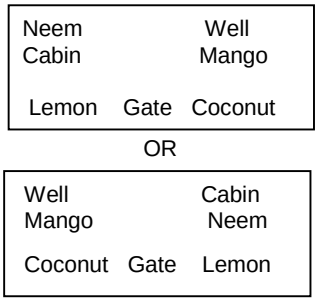
The Well and the Cabin are at either end of the Wall opposite to the Gate.

Mango tree and Cabin are not at the same corner. So, Neem tree and Well are not at the same corner. This means that Mango tree and the Well are at the same corner and Neem tree and the Cabin are at the same corner.



6. Let us take each choice and check with the above diagram to see if it is possible or not.
Neem and Lemon can be diagonally opposite each other. Hence, this is the correct answer choice. (In an exam, you do not need to check the other choices since the first choice is correct. But, for the sake of clarity and proper understanding, we will check all the choices).
From the diagram given above, we can see that Cabin and Neem cannot be located diagonally opposite each other.
Mango and Well cannot be located diagonally opposite to each other.
Coconut and Lemon cannot be located diagonally opposite each other. Choice (A)

7. If Lemon tree is diagonally opposite to the Well, then we can have the following two possible arrangements.



The Coconut tree is diagonally opposite the Cabin and Neem. Choice (C)

8. Since Coconut and Neem trees cannot be at adjacent corners, the following arrangements are possible.

(Well, Mango)	(Cabin, Neem)
Coconut	Lemon

OR

(Cabin, Neem)	(Well, Mango)
Lemon	Coconut

From the above diagrams, we find that choice (D) is the correct answer. Choice (D)

9. We check each statement with the diagram that we drew initially to find out which of the statements has to be false.
We find that choice (D) has to be false. Choice (D)

Directions for question 10: Select the correct answer from the given choices.

10. A, B, C and D play four different games among Baseball, Cricket, Kabaddi and Volley ball. A does not play Baseball or Cricket. B does not play Kabaddi or Volleyball. C plays Volleyball and D plays either Baseball or Volleyball. Who plays Cricket?
(A) A (B) B
(C) C (D) D

Solution for question 10:

10. C plays Volleyball. A does not play Cricket and D does not play Cricket as he plays either Baseball or Volleyball.
∴ B should play Cricket. Choice (B)

Exercise – 3(a)

Directions for questions 1 to 3: Select the correct alternative from the given choices.

1. Rama, Bhima and Bond have to take two articles each from the available six articles – Gun, Bow, Arrow, Mace, Sword and Dagger. Bhima will not take the Gun or the Bow, and Bond will not take any of the Sword, the Bow or the Dagger.

If one of the three persons takes the Sword and the Mace, then what is the other item selected by the person who selects the Gun?
(A) Bow (B) Arrow
(C) Dagger (D) Cannot be determined

2. Four students – Sagar, Swaroop, Sachin and Suman – went to four different cities – Mumbai, Vijayawada, Hyderabad and Nagpur – to take 4 different tests – XAT, JMET, CET, CAT. The following data is also known.
1. Suman did not take JMET.
2. Swaroop did not go to Hyderabad and he did not take CET and XAT.
3. CET was conducted in Nagpur.
4. Sagar did not go to Nagpur and he did not take CAT.
5. Sachin had gone to Mumbai.

If Sagar did not take XAT, then which of the following is the correct combination of the city visited and the test written by Swaroop?
(A) Vijayawada and JMET
(B) Nagpur and JMET
(C) Hyderabad and CAT
(D) Vijayawada and CAT

3. Each of the five trains - GT Express, AP Express, Rajdhani Express, Goa Express and Bangalore Express travel to a different city among Delhi, Goa, Chennai, Bangalore and Hyderabad, not necessarily in the same order. No two trains travel to the same city and no two cities can be reached by the same train. GT Express goes to neither Delhi nor Chennai. Neither AP Express nor Goa Express goes to Hyderabad. Bangalore can be reached by either Goa Express or AP Express. Rajdhani Express travels to Chennai. Either Goa Express goes to Hyderabad or the Bangalore Express goes to Delhi.

Which one of the following statements would help in completing the arrangement?
(A) Either Chennai can be reached by Rajdhani Express or Goa can be reached by AP Express.
(B) Only if Bangalore can be reached by Bangalore Express, then Goa can be reached by Goa Express.
(C) If Goa Express goes to Bangalore, then AP Express goes to Goa.
(D) If Bangalore can be reached by AP Express, then Delhi can be reached by Bangalore Express.

Directions for questions 4 to 6: These questions are based on the following information.

Six persons – P, Q, R, S, T and U carry an umbrella and a bag of six different colours while going to school. The colours of each of the umbrellas and each of the bags are one among red, yellow, green, blue, pink and black. None among them carries an umbrella and a bag of the same colour. Further the following information is known.
(i) S carries a blue coloured umbrella but not a black coloured bag.
(ii) The person who carries a pink coloured umbrella carries a green coloured bag.
(iii) P carries a red coloured bag but not a yellow coloured umbrella.
(iv) R carries a black coloured umbrella and T carries a yellow coloured bag.
(v) Q does not carry a black coloured bag.

4. Who carries a red coloured umbrella?
(A) T (B) U
(C) Q (D) Data inadequate

5. Which colour bag is carried by the person who carries a yellow coloured umbrella?
(A) Blue (B) Black
(C) Pink (D) Either (A) or (C)

6. Which of the following is the correct combination of the person colour of umbrella and bag he/she carries respectively?
(A) Q – red – blue (B) Q – red – black
(C) U – red – black (D) T – red – yellow

Directions for questions 7 to 9: These questions are based on the following information.

Each the five friends-Dweep, Manyata, Jagat, Poulami and Hemant, has at least one of the following items – pen, pencil, bag, ruler, calculator and eraser. Hemant has pen, pencil and calculator only. Jagat has calculator and pen only. Dweep has eraser and bag only. Poulami has eraser, bag and pencil only. Manyata has only one item. Each item is with at least one person.

7. Who has ruler?
(A) Hemant
(B) Poulami
(C) Manyata
(D) Data inadequate

8. Which of the following gives the complete list of the people who have pencils?
(A) Hemant
(B) Poulami
(C) Hemant and Poulami
(D) Hemant, Dweep and Poulami

9. Which of the items is there with more than two friends?
(A) Pencil (B) Calculator
(C) Bag (D) None of these

Directions for questions 10 to 12: These questions are based on the following data.

Nine games Cricket, Football, Hockey, Badminton, Chess, Tennis, Squash, Table-Tennis and Basketball are played by three players Kallis, Ronaldo and Sampras. Each player plays at least two games and each game is played by exactly one player. The number of games played by each player is different.

(i) Neither Ronaldo nor Sampras plays Cricket.
(ii) Neither Kallis nor Sampras plays Football.
(iii) Neither Kallis nor Ronaldo plays the maximum number of games; neither Ronaldo nor Sampras plays the minimum number of games.
(iv) Ronaldo plays one game among Hockey, Badminton and Chess.
(v) Sampras plays one game between Hockey and Badminton, Chess and Squash, Basketball and Table-Tennis.
(vi) Kallis plays Badminton and Ronaldo does not play Table-Tennis.

10. Which games does Sampras play?
(A) Hockey, Chess and Squash.
(B) Football, Chess and Basketball.
(C) Hockey, Tennis, Squash and Table-Tennis.
(D) Tennis, Squash, Football and Chess.

11. Which games does Ronaldo play?
(A) Football, Chess, Basketball and Squash.
(B) Football, Tennis and Chess.
(C) Football, Hockey, Chess and Squash.
(D) Football, Chess and Basketball.

12. Which among the following is definitely true?
(A) Kallis plays three games.
(B) Ronaldo does not play Chess and Basketball.
(C) Sampras does not play Cricket, Football and Chess.
(D) Kallis plays Cricket, Badminton and Squash.

Directions for questions 13 to 15: These questions are based on the following information.

Four students Rashmi, Rukmini, Rajni and Rosy participated in the 100 m race of the annual sports meet and finished in the first four positions, not necessarily in that order.

Each of these students was wearing a different coloured jersey and each jersey had one different number written over it, from among the numbers 1, 2, 3 and 4.

The following information is known about them.
Rashmi won the race and was wearing a Red coloured Jersey. The girl, who came third in the race, wore the jersey numbered '1'. Rukmini finished the race ahead of the girl wearing the Yellow jersey but she wasn't wearing the jersey numbered '2'. Only one girl finished in the same position as the number written on her jersey. Rajni beat the girl wearing the jersey numbered '3' and Rosy wore a Yellow jersey. One of the four girls wore a Blue coloured jersey. The Green coloured jersey had '2' written over it.

13. Who wore the Blue jersey?
(A) Rashmi
(B) Rajni
(C) Rukmini
(D) Cannot be determined

14. Which two girls were wearing jerseys numbered '1' and '2'?
(A) Rashmi and Rajni
(B) Rukmini and Rashmi
(C) Rajni and Rukmini
(D) Rosy and Rajini

15. Which of the following is true?
(A) Rashmi wore the jersey numbered '4' and finished in 2nd position.
(B) Rosy wore the jersey numbered '3' and she finished 3rd.
(C) Rajni wore the Green jersey and did not finish 3rd.
(D) Jersey number of Rajni is 1 and she finished 2nd.

Directions for questions 16 to 18: These questions are based on the following information.

Each of the six houses A through F has exactly two of the following appliances – TV, AC, Solar Heater and refrigerator. Following is the information known about them.
(i) No two houses have the same set of appliances.
(ii) Neither B nor E has a TV and B does not have AC.
(iii) F has AC and solar heater.
(iv) A has refrigerator.

16. Which of the appliances does B have?
(A) AC and Solar heater
(B) AC and refrigerator.
(C) Solar heater and refrigerator.
(D) Cannot be determined

17. Which of the house has AC and refrigerator?
(A) B (B) C
(C) E (D) Cannot be determined

18. What are the appliances that C has?
(A) TV and refrigerator
(B) TV and AC
(C) TV and solar heater
(D) Cannot be determined

Directions for questions 19 to 21: These questions are based on the following information.

Each of the five executives A, B, C, D and E, of a company went to a different place among Mumbai, Kolkata, Delhi, Chennai and Bengaluru. Each of them stayed in a different hotel among Taj, Grand, Oberoi, Basera and Jahanuma. Each of these hotels is either a four star hotel or a five star hotel. The following information is known.

(i) A went to Delhi but did not stay in Oberoi hotel.
(ii) The person who went to Mumbai stayed in Taj Hotel.
(iii) Among these five hotels the number of 5 star hotels is more than the number of 4 star hotels.
(iv) Basera and Jahanuma are four star hotels.
(v) C stayed in a 5 star hotel which is neither in Mumbai nor in Kolkata.
(vi) D went to Bengaluru and stayed in a four star hotel which is not Basera.
(vii) E did not stay in a 5 star hotel.

19. Who went to Chennai?
(A) B (B) E (C) C (D) D

20. Where is the Grand Hotel?
(A) Kolkata (B) Delhi
(C) Chennai (D) Bangaluru

21. Which of the following is the correct combination of hotel, place and person respectively?
(A) B – Mumbai – Taj
(B) Basera – Kolkata – D
(C) Oberoi – Chennai – B
(D) None of these

Directions for questions 22 to 24: These questions are based on the following information.

Each of the six friends-Tanvi, Toshi, Rupa, Renu, Jaya and Bina are students of an Engineering college. Each of them belong to a different state among M.P., U.P., A.P., T.N., H.P., and W.B. and each of them is studying a different branch of engineering among Electronics, Computer Science, Information Technology, Electrical, Mechanical and Civil. Following is the information known about them.

(i) Rupa is from U.P and the person from M.P is studying Information Technology.
(ii) Renu is studying Electronics but is not from W.B.
(iii) Tanvi is from H.P but is not studying Civil Engineering.
(iv) The person from T.N. is not studying Electronics.
(v) Toshi is neither from W.B. nor studying Information Technology.
(vi) Bina is studying Computer Science.
(vii) The person from T.N. is studying neither Mechanical engineering nor in Civil Engineering.

22. Which branch is Toshi studying?
(A) Mechanical
(B) Civil
(C) Electrical
(D) Data inadequate

23. The person who is studying the Mechanical branch is from _____
(A) T.N. (B) U.P (C) A.P (D) H.P

24. Which of the following is the correct combination of the person, state and branch respectively?
(A) Rupa – U.P. - Mechanical
(B) Bina – T.N. – Computer Science.
(C) Jaya – M.P. – Information Technology.
(D) None of these

Directions for questions 25 to 27: These questions are based on the following information.

Two male singers – Kailash and Sonu and two female singers Shreya and Kavita are singing for four different movies – M_1, M_2, M_3 and M_4 of four different directors – D_1, D_2, D_3 and D_4. In each movie a male singer and a female singer worked, but no two movies has the same pair of male and female singers. We know the following information.

(i) Neither M_1 nor M_3 is directed by D_3 or D_4.
(ii) The male singer for director D_4 is Kailash and the female singer for M_3 is not Shreya.
(iii) Kavita and Sonu work together in M_2.
(iv) M_3 is the movie directed by D_2.

25. Who is the director of the movie M_4?
(A) D_2
(B) D_3
(C) D_4
(D) Cannot be determined

26. Which pair of singers work together in movie M_3?
(A) Kailash – Shreya
(B) Kailash – Kavitha
(C) Sonu – Shreya
(D) Cannot be determined

27. In which movie does the pair Sonu and Shreya worked together?
(A) M_2 (B) M_3 (C) M_1 (D) M_4

Directions for questions 28 to 30: These questions are based on the following information.

Six persons – A, B, C, D, E and F are wearing a different coloured dress among red, green, blue, yellow, violet and white. Following is the information known about them.

(i) Neither C nor F is wearing either a red or an yellow coloured dress.
(ii) Neither of D and E is wearing the dress of colour white, red or blue.
(iii) B is wearing either a green or a blue coloured dress.
(iv) Neither D nor F is wearing a violet coloured dress.
(v) E is not wearing either a green or a violet coloured dress.

28. Who is wearing the green coloured dress?
(A) B (B) C (C) D (D) F

29. What colour dress is A wearing?
(A) Green (B) Blue
(C) Red (D) White

30. Who is wearing the white coloured dress?
(A) A
(B) F
(C) C
(D) Data inadequate

Exercise – 3(b)

Directions for questions 1 to 3: These questions are based on the following information.

There are six offices – P, Q, R, S, T and U – in each of which one employee out of A, B, C, D, E and F works. No employee works in two offices and no office has any two of these employees. If A works in R, then D works in T. Either C or E works in S. Only if F works in R, then B works in P. D works in Q, and either B or F works in U. Either A or F works in P.

1. If C works in R, then which of the following statements is definitely true?
(A) B works in U. (B) A works in P.
(C) E works in T . (D) None of these

2. Which of the following helps in completing the arrangement?
(A) F works in T and A works in P.
(B) C works in T and B works in P.
(C) B works in U and E works in R.
(D) F works in P and C works in S.

3. If F does not work in P and C works in R, then what is the total number of possible arrangements?
(A) 4 (B) 3 (C) 2 (D) 1

Directions for questions 4 to 6: These questions are based on the following information.

Ten monkeys A through J visit a garden which has tree bearing fruits viz, Mango, Guava, Banana and Berry.
Further it is known that
(i) Only one monkey visited all the trees.
(ii) Every tree is visited by six monkeys.
(iii) A, D, E, G, I, J visited the Guava tree.
(iv) D, F, G did not visit the Berry tree.
(v) B, C, D, G, I, J visited the Banana tree.
(vi) J, A, H did not visit the Mango tree.
(vii) Every monkey visited at least one tree and exactly two monkeys visited one tree only.

4. Which of the following monkeys visited all the trees?
(A) D (B) G (C) I (D) J

5. How many monkeys visited exactly three trees?
(A) 3 (B) 4 (C) 5 (D) 2

6. Which of the following monkeys have visited the Berry tree?
(A) B (B) C (C) A (D) F

Directions for questions 7 to 9: These questions are based on the following information.

Three friends – Anand, Bhuvan and Chander – have to select and buy some different music cassettes out of the six cassettes of six different singers, namely – UB40, Vanessa, Williams, Xavier, Yellows and Zoloto.

Out of these three friends, one chooses five cassettes, another chooses four cassettes and the remaining person chooses three cassettes. There are exactly two different singers' cassettes, out of the six singers, which are bought by all the three persons. No person has more than one cassette of the same singer. It is known that Bhuvan does not have UB40, Anand does not have Zoloto and Chander does not have Williams. The number of cassettes that Anand buys is more than the number of cassettes bought by Chander. Also, any person must have either UB40 or Zoloto, but not both. If a person has Vanessa, then he must have Yellows also. If a person has Yellows, then he must have Xavier also. Vanessa is bought by exactly one person. Also, each cassette is bought by at least one person.

7. Who has the least number of cassettes?
(A) Anand
(B) Bhuvan
(C) Chander
(D) Cannot be determined

8. Which among the following could be the group of cassettes belonging to only two owners?
(A) Xavier and Yellows
(B) Zoloto and Williams
(C) UB40 and Zoloto
(D) None of these

9. How many different arrangements are possible for the number of cassettes with the three friends?
(A) 6 (B) 3
(C) 2 (D) None of these

Directions for questions 10 to 12: These questions are based on the following information.

Eight students – A, B, C, D, E, F, G, H – went to four different places among Resort, Beach, Hotel and Cinema, such that each place was visited by two students each.
Each student visited exactly one place. After their return, their teacher asked them about the place visited by each of them. Following were their answers:
(i) A said "I did not go with C or D and went to the Resort or the Cinema".
(ii) B said "I did not go with E or G and went to the Hotel or the Cinema.
(iii) C said "I did not go with D or F and went to the Beach or the Resort.
(iv) D said "I did not go with B or H and went to the Beach or the Hotel".
(v) E said "I went with B or C or D or F or H and went to the Cinema or the Beach".
(vi) F said "I did not go with A or G and went to the Resort or the Cinema".
(vii) G said "I went with B or D or E or F or H and went to the Beach or the Hotel".
(viii) H said "I did not go with C or A and went to the Resort or the Beach".

10. Who among the following went with A?
(A) E (B) B (C) G (D) H

11. E went with _____ and visited the _____.
(A) C, Beach (B) F, Cinema
(C) D, Beach (D) G, Beach

12. If only D and H lied about the places visited by them, then with whom did D visit the place of his choice?
(A) H
(B) F
(C) G
(D) Cannot be determined

Directions for questions 13 to 17: These questions are based on the following information.

A group of six persons – Babar, Humayun, Akbar, Jahangir, Shahjahan and Aurangjeb, visited Angel world, where there were six rides – R_1 through R_6, among which two were for children, two for adults and two were common for all. There were three children and three adults in the group. Each of them went for at least three rides. The cost of each ride is ₹10 per person. Before going for any adults' or any children's ride one must go for at least one of the common rides. Before going for R_6 one must go for R_3. Four persons went for both R_1 and R_2. Akbar did not go for R_1 or R_6. Shahjahan went for both R_6 and R_3. R_4 is a children's ride. No adult went for children's ride and no child went for an adult's ride. They spent a total amount of ₹200 on these rides. No two of them have same combination.

13. What percentage of total expenditure did they spend on common rides?
(A) 40 (B) 50 (C) 55 (D) 25

14. If Humayun was an adult, which of the following rides he must have went for?
(A) R_3 (B) R_6 (C) R_5 (D) R_2

15. If Aurangjeb and Babar were children, then what was the least number of rides which were rode by both of them?
(A) 0 (B) 1 (C) 2 (D) 3

16. If Jahangir did not go for R_2, then Humayun must have went for _____
(A) R_2 (B) R_3
(C) R_4 (D) Cannot be determined

17. Which of the following statements will give us a clear distribution?
(A) Both Shahjahan and Aurangjeb went for four rides each.
(B) Babar, Akbar and Shahjahan were children.
(C) No ride was visited by both Akbar and Jahangeer.
(D) None of the above

Directions for questions 18 to 21: These questions are based on the following information.

Eight persons – P to W – study in three different colleges among A, B, and C and three different streams among X, Y, and Z, but not necessarily in the same order. No two persons who study the same stream study in the same college. At least two persons and at most three students study each stream and in each college.

P does not study in college C and Q does not study stream Y. R and Q study in the same college; P and V study the same stream. T and W study in the same college. S studies either stream Y or stream Z. U and Q study the same stream. R studies stream Z and in college A. V does not study stream Y. T studies in either the college A or college C. S and W study the same stream.

18. Who among the following studies stream Y?
(A) P (B) S (C) U (D) Q

19. In which of the following streams does T study?
(A) Z (B) Y
(C) X (D) Either X or Z

20. Who among the following studies in college B?
(A) P (B) R (C) T (D) V

21. Which of the following 'person – stream – college' combinations is definitely true?
(A) S – Y – B (B) T – X – B
(C) V – Y – C (D) U – X – B

Directions for questions 22 to 24: These questions are based on the following information.

Eight employees – P through W of a company went to camps to different places among – Bangalore, Hyderabad, Mumbai and Delhi in different months among – April, September, October and December in a year. Those employees who went to the same place, did not go in the same month. Exactly two employees went in the same month and exactly two employees went to the same place.

T went to Delhi, in either October or April. V went in September to neither Hyderabad nor Mumbai. One of the employees who went to Bangalore went in December. S went in December. U and R went to the same place, R and W went in the same month. P, R and Q went to different places, but not to Mumbai and they went in different months, but not in April. P did not go in September.

22. Who among the following went to Delhi?
(A) P (B) Q (C) R (D) V

23. Who among the following went in October?
(A) P (B) Q (C) R (D) T

24. Which among the following group of employees went to the same place?
(A) P, S (B) Q, T (C) V, Q (D) S, T

Directions for questions 25 to 27: Study the information below to answer these questions.

Mayor, Avinash, Govind, Alok, Mahesh, Nikhil and Mohit study in four different departments of the same college i.e., CSE, ECE, Mechanical Engineering and Chemical Engineering, not necessarily in the same order.
(i) Not more than two study in the same department.
(ii) Each one of them wears a different coloured shirt, i.e., white, blue, cream, red, black, yellow and pink, not necessarily in the same order.
(iii) Mayor studies CSE along with Govind but does not wear white shirt.
(iv) Mahesh wears yellow shirt and does not study Chemical Engineering.
(v) Avinash studies with Alok in the same department and wears black shirt.
(vi) Only Nikhil studies ECE.
(vii) Mohit is in the same department as Mahesh.
(viii) None studying either CSE or Mechanical engineering wears cream shirt.
(ix) Govind wears red shirt, the one who wears pink shirt is studying Chemical Engineering.

25. Identify the pair belonging to Chemical Engineering.
(A) Mayor, Avinash
(B) Mahesh, Mohit
(C) Alok, Avinash
(D) Alok, Nikhil

26. Identify the colour of the shirt Mohit is wearing?
(A) White (B) Cream
(C) Blue (D) Red

27. What is the colour of the shirt that Alok is wearing?
(A) Cream (B) Black
(C) Pink (D) Red

Directions for Questions 28 to 30: These questions are based on the following information.

Five friends Roy, Boy, Yoy, Goy and Moy went to purchase backpacks, for themselves of the same brand and design but different colors among: Red, Blue, Yellow, Green and Maroon. Further, the following information is known:
(A) Each person's first letter did not match with the color of the bags they bought.
(B) Yoy hates Green and Maroon and so did not purchase it.
(C) Roy and Boy like the green color of the backpack their friend bought.
(D) Goy and her friend purchase the backpack in such a manner that the color of Goy's backpack matches with the first letter of her friend's name, while her friend purchased a green backpack.

28. If Roy exchanged his backpack with Yoy, and Yoy exchanged his backpack with Boy, and after these exchanges were made, they all had backpacks with the first letters of their names matching with the first letters of the colors of the backpacks, then which of the following is true?
(A) Boy purchased a red backpack.
(B) Boy purchased a yellow backpack.
(C) Yoy purchased a blue backpack.
(D) Roy purchased a yellow backpack.

29. Which of the following statements is not necessarily true?
(A) Either Roy or Moy bought a green backpack.
(B) Yoy bought a red or a blue backpack.
(C) Roy or Boy bought a yellow backpack.
(D) Roy or Goy bought a blue backpack.

30. Two friends found that their backpacks were interchanged in such a manner that the color of exactly one person's backpack and her name started with the same letter. However, conditions (b) to (d) are not violated. Which of the following conditions lets you completely determine the colors bought by all five friends?
(A) The interchange took place between Goy and Moy.
(B) The interchange took place between Roy and Boy.
(C) Neither Roy nor Yoy has maroon after the interchange.
(D) The interchange happened between Yoy and Moy.

Key

Exercise – 3(a)

1.	B	6.	D	11.	D	16.	C	21.	D	26.	B
2.	D	7.	C	12.	C	17.	C	22.	C	27.	C
3.	B	8.	C	13.	C	18.	D	23.	D	28.	C
4.	A	9.	D	14.	C	19.	C	24.	C	29.	C
5.	B	10.	C	15.	C	20.	B	25.	C	30.	B

Exercise – 3(b)

1.	D	6.	C	11.	A	16.	A	21.	D	26.	A
2.	D	7.	C	12.	B	17.	D	22.	B	27.	C
3.	C	8.	D	13.	B	18.	B	23.	C	28.	B
4.	C	9.	C	14.	A	19.	C	24.	B	29.	D
5.	B	10.	B	15.	C	20.	A	25.	C	30.	B