CHAPTER
6

Team Selection

LEARNING OBJECTIVES

- Different types of Team Selection Questions
- Notations to mark the data
- Language Interpretation
- Methods to solve the questions

Questions belonging to this genre will provide a set of objects or people etc. and then a set of conditions. On the basis of these conditions, one is expected to make choices regarding the formation of the team. It is advisable to jot down the conditions and items to be formed into teams carefully.

In most of these set of questions, you will find that the parent data provides the basic guidelines and subsequently every question introduces one new condition.

It is imperative here to understand that while parent data is applicable to all the questions in the set, data supplied in any question is applicable to that particular question only, and not to the other questions unless specified otherwise.

Understanding the Keywords and Types of Statements

These questions will throw a gauntlet of simple but contextually confusing words at the students. Some of these words/types of statements have been listed below:

1. At least one element – It means one or more – Symbolically, we can represent this as: 1+
2. At most one element – It means zero or one – Symbolically, we can represent this as: 0/1
3. At most two elements – It means zero or one or two – Symbolically, we can represent this as: 0/1/ 2.
4. Conditional clauses [Read chapter "Logical Links" in this book to understand these conditional clauses better]:

   If A is selected, then B will also be selected.

   Following inferences can be drawn:

   (a) If A is selected, B has to be selected.
   (b) There cannot be a case where A is selected but B is not selected.
   (c) It is possible that B has been selected but A may be/may not be selected.
   (d) If B has not been selected, then we can conclude that A also has not been selected.
   (e) It is not possible that B has not been selected, but A has been selected [rephrasing of inference (b) above].

In a nutshell, A alone cannot be selected though B alone can be selected.

Go through the following problem sets to understand the type of problems and techniques to solve the same. Do not look at the solution till you are convinced that you have attempted it at your best level.

Directions for questions 1 to 6: ***Read the information given below and solve the questions based on it.***

Three adult women (R, S, and T), two adult men (U and V), and four children (W, X, Y, and Z) are going to a watch a movie. Though, during the online booking of the tickets, they realized that the nine seats available for the show are in three different classes—Silver Class, Gold Class and Lounge. The layout also showed that in each class, three adjacent seats are available.

To watch the movie, they decide to have the three groups of three members each as per the following conditions:

- No adults of the same gender can be together in ONE group.
- W cannot be in R's group.
- X must be in a group with S or U or both.

Exercise 1

Team selection for exercise1 Q1 to Q6

Q.1 If R is the only adult in one group, the other members of her group must be
(a) W and Y (b) X and Y
(c) X and Z (d) Y and Z

Q.2 R and U share a good rapport, and hence decide to be in the same group. Who can be in the second and third groups, respectively?
(a) S, T, W; V, Y, Z (b) S, X, Y; T, W, Z
(c) T, V, W; S, Y, Z (d) W, X, Y; S, V, Z

Q.3 Which of the following pairs of people can be in the same group as W?
(a) R and Y (b) S and U
(c) S and V (d) U and V

Q.4 Which of the following must be true?
(a) One of the women is in a group with two children.
(b) One of the two men is in a group with W.
(c) R is in a group with a man.
(d) One of the groups includes no children.

Q.5 Any of the following pairs of people could be in a group with X EXCEPT
(a) R and U (b) S and T
(c) S and U (d) S and W

Q.6 Given that T, Y, and Z form one group. Which of the following must be together in one of the other groups?
(a) R, S, V (b) R, U, W
(c) S, U, W (d) S, V, W

Directions for questions 7 to 10: ***Read the information given below and solve the questions based on it.***

dueNorth presently employs three Marketing Managers (MM)—A, B and C and five faculty members—D, E, F, G and H. Company is planning to open a new office. It is planning to relocate two of the three marketing managers and three of the five faculty members to the new office. Management wants to ensure that the individuals who do not function well together should not be sent as a part of the team.

Following information was available to the HR department of dueNorth:

Marketing Managers A and C cannot be sent as a team to the new office.

C and E are excellent performers, though, they do not share good rapport, and hence should not be sent together.

If D is sent, then G cannot be sent, and vice versa.

D and F should not be together in a team.

Q.7 If D goes to the new office which of the following is (are) true?
A. C cannot go B. A cannot go
C. H must also go
(a) A only (b) B and C only
(c) A and C only (d) A, B and C

Q.8 If A is to be moved as one of the Marketing Managers, which of the following cannot be a possible working unit?
(a) ABDEH (b) ABFGH
(c) ABEGH (d) ABDGH

Q.9 If C and F are moved to the new office, how many combinations are possible?
(a) 0 (b) 1
(c) 2 (d) 3

Q.10 Who among the Marketing Managers and the faculty members is sure to find a berth in the new office?
(a) D (b) H
(c) G (d) B

Directions for questions 11 to 13: ***Read the information given below and solve the questions based on it.***

Seven students at a B school who live in a dormitory are being formed into groups that consist of two or three or four members at a time. The groups may change but at any time, each person can be a part of one and only one group. The following guidelines have to be adhered to while forming the groups

- The students are Nitin, Priyanka, Rahul, Sumit, Tanay, Urmila and Vinay.
- Nitin cannot be in the same group as Sumit.
- Tanay must be in a group that includes either Sumit or Vinay but not both.
- Vinay has to be in a group that does not contain even number of members.

Q.11 Which of the following is a possible list of three groups that can coexist?

1	Nitin, Vinay	Tanay, Rahul, Urmila	Sumit, Priyanka
2	Nitin, Tanay	Vinay, Rahul, Sumit	Priyanka, Urmila
3	Nitin, Urmila	Rahul, Sumit	Vinay, Tanay, Priyanka
4	Urmila, Sumit	Vinay, Tanay	Priyanka, Nitin, Rahul

Q.12 If a group of 3 members and another of 4 members is formed and one of these two groups has Vinay and Urmila, who else is likely to be in the same group?

(a) Nitin (b) Sumit
(c) Priyanka (d) Rahul

Q.13 If a group of three is formed with Rahul, Tanay and Vinay, then how many groups will be there amongst the seven students?
(a) 2
(b) 3
(c) either 2 or 3
(d) insufficient Data

Directions for questions 14 to 15: ***Read the passage given below and solve the questions based on it.***

Digviza and three other members of her yoga club dined out together. Each woman ordered either salad or soup to start with, and one of the three entrees (a dish served before the main course)—cabbage rolls, eggs benedict, or lasagna. Refer to the clues given below and answer the following questions:

- Every order was different. Each dish mentioned above was ordered at least once.
- Kejri and the lady who ordered the salad both ordered lasagna as the entree.
- Rajdev and Sonila both ordered soup as the first course.
- Sonila did not order the eggs benedict.

Q.14 How many women ordered salad?
(a) 1 (b) 2
(c) 3 (d) 4

Q.15 Who ordered salad and cabbage rolls?
(a) Digviza (b) Rajdev
(c) Sonila (d) None

Directions for questions 16 to 20: ***Read the information given below and solve the questions based on it.***

K, L, M, N, P, Q, R, S, U and W are the only ten members in a department. There is a proposal to form a team from within the members of the department, subject to the following conditions:

- A team must include exactly one among P, R, and S.
- A team must include either M or Q, but not both.
- If a team includes K, then it must also include L, and vice versa.
- If a team includes one among S, U, and W, then it must also include the other two.
- L and N cannot be members of the same team.
- L and U cannot be members of the same team.
- The size of a team is defined as the number of members in the team.

Q.16 Who cannot be a member of a team of size 3?
(a) L (b) M
(c) N (d) P
(e) Q

Q.17 Who can be a member of a team of size 5?
(a) K (b) L
(c) M (d) P
(e) R

Q.18 What would be the size of the largest possible team?
(a) 8 (b) 7
(c) 6 (d) 5
(e) cannot be determined

Q.19 What could be the size of a team that includes K?
(a) 2 or 3 (b) 2 or 4
(c) 3 or 4 (d) Only 2
(e) Only 4

Q.20 In how many ways a team can be constituted so that the team includes N?
(a) 2 (b) 3
(c) 4 (d) 5
(e) 6

Directions for questions 21 to 25: ***Read the information given below and solve the questions based on it.***

There are three projects—P1, P2 and P3. A student can select either one project or two projects or all the three projects subject to the conditions given below:

Condition 1: Both P1 and P2 have to be selected.

Condition 2: Either P1 or P3, but not both, has to be selected.

Condition 3: P2 can be selected only if P3 has been selected.

Condition 4: P1 can be selected only if P3 has been selected.

Q.21 How many different selections can be made if no conditions are imposed?
(a) 5 (b) 6
(c) 7 (d) 8
(e) 4

Q.22 How many selections can be made to meet condition 1 as given above?
(a) 1 (b) 2
(c) 3 (d) 4
(e) 0

Q.23 How many selections can be made to meet condition 2 as given above?
(a) 2 (b) 3
(c) 4 (d) 5
(e) 1

Q.24 How many selections can be made meeting the conditions 2 and 3 as given above?
(a) 0 (b) 1
(c) 2 (d) 0 or 1
(e) None of these

Q.25. How many selections can be made meeting the conditions 1, 2 and 3 as given above?
(a) 0 (b) 1
(c) 2 (d) 3
(e) None of these

Exercise 2

Directions for questions 1 to 4: ***Read the information given below and solve the questions based on it.***

Hosting Filmware award ceremony is a big affair. There are lot of things to be done—anchoring, managing the filler entertainment on-stage performance, crowd management, security etc. To conduct the filler entertainment on-stage performances, name of two male actors—Abhi and Riteish—and three female actors—Rani, Shreya and Alia—have been finalized. These five actors will give a performance of a satire play named "Angrezo Bharat Aao" that has exactly eight roles.

Following conditions are to be kept in mind while allocating roles:

Roles 1, 2 and 3 must be played by male actors.

Roles 4, 5 and 6 must be played by female actors.

Roles 7 and 8 can be played by either male or female actors.

Each actor must play at least one role.

The pairs of roles below are the only pairs that do NOT require the actors playing the roles to be on stage at the same time:

Roles 1 and 2	Roles 3 and 6
Roles 3 and 7	Roles 4 and 5
Roles 4 and 8	Roles 5 and 8

Appearances in these roles are spaced far enough apart to allow time for costume changes for actors playing more than one role.

Rani and Shreya cannot play roles that require them to be on stage together at the same time.

Q.1 Each of the following pairs of roles could be played by the same actor EXCEPT

(a) roles 1 and 2 (b) roles 3 and 6
(c) roles 3 and 7 (d) roles 4 and 8

Q.2 If Riteish plays role 1, which of the following must be true?

(a) Abhi plays role 2 (b) Abhi plays role 7
(c) Shreya plays role 4 (d) Rani plays role 4

Q.3 Which of the following is an acceptable assignment of roles 4, 5 and 6 respectively?

(a) Rani, Rani, Rani (b) Rani, Alia, Rani
(c) Rani, Shreya, Alia (d) Shreya, Alia, Rani

Q.4. Abhi could play any of the following roles EXCEPT?

(a) 1 (b) 2
(c) 3 (d) 8

Directions for questions 5 to 8: ***Read the information given below and solve the questions based on it.***

On a Sunday, five friends—ohn, Karan, Ranbir, Mithun and Onir—have gathered to play a game called Trios consisting of three rounds. In each round of the game, exactly three of these friends will play. Consider following rules regarding the participation:

No person can play in three consecutive rounds.

No person can sit out two consecutive rounds.

In any game, each of the five persons must play in exactly three rounds.

Q.5 If John, Karan and Ranbir play in a first round, which of the following could be playing in that game's second round?

(a) John, Karan, Mithun
(b) John, Karan, Onir
(c) John, Ranbir, Mithun
(d) Karan, Mithun, Onir

Q.6 In an individual game, Karan, Ranbir and Mithun Play in the first round and John, Ranbir and Mithun play in the third round. Then the players in the second round must be:

(a) John, Karan, Ranbir
(b) John, Karan, Mithun
(c) John, Karan, Onir
(d) Karan, Ranbir, Onir

Q.7 In an individual game, Ranbir and Onir do not play in the first round. Which of the following must be true?

(a) Ranbir plays in rounds three and four
(b) Onir plays in rounds three and five
(c) Ranbir and Onir both play in round four
(d) Ranbir and Onir both play in round five

Q.8 In an individual game, John, Ranbir and Mithun play in the first round, and Karan, Mithun and Onir play in the second round, which of the following must play in the fourth round?

(a) John (b) Karan
(c) Ranbir (d) Mithun

Directions for questions 9 to 11: ***Read the information given below and solve the questions based on it.***

During the Chemistry practical examination, a naughty student removed the labels pasted on the four bottles—that contain colorless liquids. Incharge of the lab knows that there are only six possibilities of the liquids present in the bottles—pure X liquid, pure Y liquid, pure Z liquid, or any mixture of these. No two bottles are filled with the same liquid or the same combination of any of these. The only feasible way of testing for the identity of the liquids is to use strips of Mitlus paper—that turns red, black, or yellow depending on which of certain liquids it is dipped in. The full table of colour changes when Mitlus paper is dipped inside is given below:

Liquid	Turns to the colour when Mitlus paper is dipped inside
Pure X	Black
Pure Y	Red
Pure Z	Black

X and Y	Yellow
X and Z	Yellow
Y and Z	Red
X and Y and Z	Black

Q.9 If none of the four liquids turns the Mitlus paper yellow, each of the following must be the contents of one of the bottles EXCEPT
(a) Pure X
(b) Pure Y
(c) Y mixed with Z
(d) X, Y, and Z mixed together

Q.10 If the liquid in the first bottle tested turns the Mitlus paper red, and if the liquid in the second bottle tested turns the paper yellow, then a mix of some of the liquid from each of the first two bottles tested will turn the Mitlus paper
(a) Yellow
(b) Either red or black
(c) Either red or yellow
(d) Either black or yellow

Q.11 If the liquid in the first bottle tested turns the Mitlus paper red and the liquid in the second bottle tested turns it black, and if a mix of some of the liquids from each of the first two bottles tested turns it red, then which of the following must be true?
(a) The first bottle tested contains pure Y
(b) The first bottle tested contains Y mixed with Z.
(c) The second bottle tested contains pure X.
(d) The second bottle tested contains pure Z.

Directions for questions 12 to 15: ***Read the information given below and solve the questions based on it.***

Fargo, Goodday and HomeTrade are three retail companies, and Q, R, S, and T are four research associates. Each associate works for at least one of the retail companies.

Q always works for Fargo and at least one of the other companies.

Some of the time Goodday employs only one of these associates, the rest of the time it employs exactly two of them.

Fargo and HomeTrade each employ exactly two of these detectives all the time.

Answer all the questions on the basis of the information given above.

Q.12 If R works for HomeTrade only, and if S works for Goodday and HomeTrade only, then T works for
(a) Fargo only
(b) Goodday only
(c) HomeTrade only
(d) Both Fargo and Goodday

Q.13 If Q and R both work for the same two retail companies, T must work for
(a) Both Fargo and Goodday
(b) Both Fargo and HomeTrade
(c) Either Fargo or Goodday but not both
(d) Either Goodday or HomeTrade but not both

Q.14 If only S works for Goodday, which of the following must be true?
(a) R works for either Fargo or Goodday but not both
(b) T works for either Goodday or HomeTrade but not both
(c) R and T cannot work for the same company
(d) Q and R cannot work for the same company.

Q.15 If G employs only one detective, which of the following must be true?
I. R works for two companies
II. T works for Goodday
III. S works for only one company
(a) I only (b) II only
(c) III only (d) I and II only

Directions for questions 16 to 19: ***Read the information given below and solve the questions based on it.***

When I went to buy an aquarium for my home, I was given a choice of seven fish species—F, G, H, I, J, K, and L—to be chosen from. I decided to put exactly six fishes (of same or different species) to be put in the aquarium. Though I was told by the owner of the shop that some of these fishes are quite violent towards other species of the fishes and if I put those fishes in the same aquarium tank, they will fight, and I obviously want to avoid that situation.

Consider the following restrictions

Fish of species F will fight with fish of species H, J, and K.

Fish of species I will fight with fish of species G and K.

If three or more fish of species I are in one aquarium tank, they will fight with each other.

Fish of species J will fight with fish of species I.

If a fish of species G is to be in an aquarium tank, at least one fish of species K must also be in the aquarium tank.

Q.16 If an aquarium tank is to contain fish of exactly three different species, which of the following could be these species?
(a) F, G and I (b) F, I and K
(c) G, H, and I (d) H, I, and J

Q.17 Only two species of the fishes are to be put in the aquarium tank with the condition that three fishes of species J have to be out of six fishes to be put in the aquarium tank. Other three fishes in that aquarium tank could be from which of the following species?
(a) F (b) G
(c) H (d) I

Q.18 If aquarium tank is to contain fish of exactly four different species, which of the following species of the fish cannot be put?
(a) F (b) G
(c) H (d) J

Q.19 Which of the following species of the fishes can be put into aquarium tank with fish of species G?
(a) F and I (b) F and J
(c) H and I (d) H and K

Directions for questions 20 to 25: ***Read the information given below and solve the questions based on it.***

Members of the upper house and lower house are to be selected from exactly six qualified candidates. The six candidates are U, V, W, X, Y and Z.

Consider the following:

Each house must have exactly three members.

The two houses must have at least one member in common.

If X is selected for a house, Y must also be selected for that house.

Q.20 If the members of the Upper House are selected first, which of the following could be those selected?
(a) U, V and X (b) U, X and Z
(c) V, W and X (d) V, X and Y

Q.21 If the two houses have parallel terms of office, which of the following could be selected as the members of the Upper House and as the members of the Lower House, respectively, for one such term of office?
(a) U, V and W; X, Y and Z
(b) U, W and Y; V, X and Z
(c) U, X and Y; U, X and Z
(d) W, X and Y; X, Y and Z

Q.22 If the members of the Upper House are V, W, and Z, and if the Lower House is to have as many members in common with the Upper House as the rules allow, the Lower House must consist of
(a) U, V and W (b) V, W and Z
(c) W, Y and Z (d) X, Y and Z

Q.23 Assume that U, V and W make up the Upper House, and W, Y, and Z make up the Lower House. Which of these house members could yield his or her place on a house to X without causing any other changes?
(a) U (b) W
(c) Y (d) Z

Q.24 If U and X are each selected for a house and only Z is selected for both house, which of the following must be true?
(a) V is selected for the same house as W.
(b) W is selected for the same house as Y.
(c) U is selected for a different house than Y.
(d) X is selected for a different house than Y.

Q.25 If X and Z are both selected for the Upper House, and if U is selected for the Lower House, each of the following pairs of people could be the other two members of the Lower House EXCEPT
(a) V and W (b) V and Z
(c) W and Y (d) Y and Z

ANSWER KEYS

Exercise 1

1. (d)	**2.** (c)	**3.** (c)	**4.** (a)	**5.** (b)	**6.** (d)	**7.** (c)	**8.** (d)	**9.** (b)	**10.** (d)
11. (c)	**12.** (a)	**13.** (b)	**14.** (a)	**15.** (d)	**16.** (a)	**17.** (c)	**18.** (d)	**19.** (e)	**20.** (e)
21. (c)	**22.** (b)	**23.** (c)	**24.** (e)	**25.** (a)					

Exercise 2

1. (b)	**2.** (b)	**3.** (c)	**4.** (d)	**5.** (d)	**6.** (c)	**7.** (d)	**8.** (d)	**9.** (d)	**10.** (d)
11. (d)	**12.** (a)	**13.** (d)	**14.** (c)	**15.** (c)	**16.** (d)	**17.** (c)	**18.** (a)	**19.** (d)	**20.** (d)
21. (d)	**22.** (b)	**23.** (d)	**24.** (c)	**25.** (a)					

Exercise 1

Answers to Q.1 to 6:

1. Since W cannot be in R's group, we can eliminate 1st option. X can only be in a group with S or U or both. Since R is the only adult, neither S nor U can be in the group. So, 2nd option and 3rd option can be eliminated as both contain X. 4th option is the correct answer because the only two children remaining to fill out the group with R are Y and Z.

Hence, option (d) is the correct answer.

2. 1st option contains two women S and T in the second group. Hence 1st option is eliminated. Similarly, in the 2nd option, first group contains U and V, both men; hence 2nd can be eliminated.

Since X must be in a group with S or U, or both, the second option and 4th option can be eliminated.

3rd option, consisting of groups R, U, X; T, V, W; and S, Y, Z, meets all of the restrictions and is the correct answer.

Hence, option (c) is the correct answer.

3. S, V, and W could form a group if the other two groups were R, Y, Z, and T, U, X or R, U, X and T, Y, Z. Thus, the third option is the correct answer.

Option (a) is incorrect. W cannot be in R's group.

Option (b) is incorrect. If S and U are in the same group, X must fill the remaining seat. But option shows that W will take the seat. Therefore, it is not possible.

D is not correct. U and V are both men and cannot be in the same group.

Hence, option (c) is the correct answer.

4. Now this is a sitter:

Option (a) is obviously correct, because there are three women and only one woman can be in ONE group, so each of the three groups must contain a woman. Further, there are more children than groups, hence at least one group must have two children. That group will include a woman along with the two children.

Option (b) is incorrect. S, W, X; R, U, Y; and T, V, Z is one of several possible sets of seating groups in which W is not in the same group as one of the two men.

Option (c) is incorrect. Using option (a) we can say that that woman can be R. Hence at best, this option is probably true, and not must be true.

Option (d) is also incorrect. Every group must include one child, because a group of three with no children would have to include two adults of the same sex, which is not possible as per the 1st condition.

Hence, option (a) is the correct answer.

5. Option a is possible and hence not the answer. R, U, X; S, V, W; and T, Y, Z is one of several possible sets of seating groups in which R and U are in X's group.

S and T are both women and cannot be in the same group. Therefore, B is the correct answer.

Option (c) is also possible and hence cannot be the answer. S, U, X; R, Z, Y; and T, V, W is one of several possible sets of seating groups in which S and U are in X's group.

Option (d) is also incorrect. S, W, X; R, V, Y; and T, U, Z is one of several possible sets of seating groups in which S and W are in X's group.

Hence, option (b) is the correct answer.

6. If T, Y, and Z form one group, the remaining two groups must be chosen from among R, S, U, V, W, and X.

Now, out of these, R and S are females and U and V are males.

R and S must be in different groups as well as U and V must be in different groups (hence 1st option is wrong). W must be in the group with S because W cannot be in the group with R (condition 2). X must thus be in the group with R, because both U and V are men and cannot both be in R's group. Since X must be in a group with U or S, and S is already in another group, the remaining slot with R and X must be taken by U. It means V will fill the remaining space in S's group.

Hence, option (d) is the correct answer.

Solutions to Q.7 to 10:

7. D and G as well as D and F cannot work together. New office requires 3 faculty members. Therefore, E, H should go. C and E cannot function together as a team. As E has to go, C cannot go. Therefore, A and B have to be the marketing managers if D is posted to San Jose.

Hence, option (c) is the correct answer.

8. ABDGH is not a working unit as D and G cannot work together.

Hence, option (d) is the correct answer.

9. If C and F are moved to the new office, then B should be the only other marketing manager who can go. Therefore, the managers are BC. Of the faculty members, E cannot go. Therefore, one has to choose 3 faculty members from D, F, G, H. D cannot be sent because if he goes, then F and G cannot go. Therefore, FGH are the faculty members and B, C are the marketing managers. Only one option available.

Hence, option (b) is the correct answer.

10. B is sure to find a berth in the group.

Hence, option (d) is the correct answer.

Solutions to Q.11 to 13:

11. Only in option c, all the conditions are satisfied. Vinay is in a group of 3. Tanay is in a group that has Vinay or Sumit, but not both and Nitin is not in the same group as Sumit.

Hence, option (c) is the correct answer.

12. Vinay has to be in a group that has 3 members. So, only one more member can be in that group. If Sumit is in that group, then Tanay cannot be a part of the other group as Tanay has to be in a group in which either Vinay or Sumit is there. So, Sumit has to be a part of the group that has 4 people. In which case, Nitin cannot be in the group that has 4 people and has to be a part of the group that has Vinay and Urmila.

Hence, option (a) is the correct answer.

13. Nitin cannot be in the same group as Sumit. Therefore, we need to have two more groups in addition to the one formed with the three people. So, there will be 3 groups amongst the seven students.

Hence, option (b) is the correct answer.

Solutions to Q.14 to 15:

Digviza ordered the salad and lasagna.
Rajdev ordered the soup and eggs benedict.
Sonila ordered the soup and cabbage rolls.
Kejri ordered the soup and lasagna.

14. Hence, option (a) is the correct answer.

15. Hence, option (d) is the correct answer.

Solutions to Q.16 to 20:

16. In the team of size 3, one member will be from P, R and S and one member will be from M and Q.

Now only one member has to be determined and we know that K and L will be always in team and since there is place for only 1 member, hence K and L will not be in team of 3 members.

Hence, option (a) is the correct answer.

17. If we take K and L we cannot take N and U so the size of team will be 4 only. Now we will take S from first statement so U and W will also be there. Now as U so there L cannot be there and hence K will also not be there. As L is not in team so we can take N so 4 members of team are S, U, W and N and because of second statement any one of M or Q will be there and only M is given in the options

Hence, option (c) is the correct answer.

18. Using first statement, if we take P or R, U and W cannot be in team. To get maximum members in team we should take S and from 4th statement U and W will also be in the team. Now either M or Q will be included in the team, and since U is there L can't be included in the team hence K will also not be there.

Now as L is not in the team, N can be included in the team. So team with maximum numbers of members will be S, W, U, N and any one from M and Q.

Hence maximum possible size of team of team is 5.

Alternatively,

Start with all the 10 members and keep removing the member who cannot be in the team.

K L M N P Q R S U W

Using condition 1, only one out of P, R and S can come. At the same time, S, U and W will come together. Hence we should select S out of P, R and S.

K L M N ~~P~~ Q ~~R~~ S U W

Next, since U has come, L cannot come. So we remove L.

K ~~L~~ M N ~~P~~ Q ~~R~~ S U W

Using point (2), only one out of M or Q can come. So eliminate M and retain Q (we could have done otherwise also).

K ~~L~~ ~~M~~ N ~~P~~ Q ~~R~~ S U W

Using point (3), if L is removed, K will also be removed.

~~K~~ ~~L~~ ~~M~~ N P Q ~~R~~ S U W

Remaining members can be part of ONE team.

Maximum team size = 5.

Hence, option (d) is the correct answer.

19. If we have to take K, L will always be there so U and N will not be in the team. As U is not in the team so S and W will also not be included in the team.

As anyone from P and R will always be there in team and same in the case with M and Q, so the size of team that include K will always be 4.

Hence, option (e) is the correct answer.

20. Following are the ways in which a team can be constituted:

(1) P, M, N
(2) P, Q, N
(3) R, M, N
(4) R, Q, N
(5) S, U, W, N, M
(6) S, U, W, N, Q

Hence, option (e) is the correct answer.

Solutions to Q.21 to 25:

1 = Project selected
0 = Project not selected

Project →	P_3	P_2	P_1
No. of cases			
(1)	0	0	1
(2)	0	1	0

(3)	0	1	1
(4)	1	0	0
(5)	1	0	1
(6)	1	1	0
(7)	1	1	1

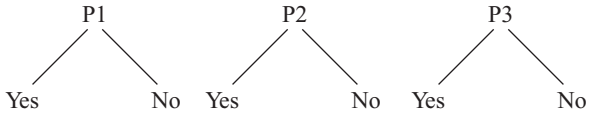
21. Method 1:

If no conditions are imposed, we have following choices to select either one project or two projects and three projects [This is the part of parent statement, and conditions start afterwards]:

P1; P2; P3; P1 and P2; P1 and P3; P2 and P3; P1, P2 and P3 ⟹ 7 choices.

Method 2:

For every project, we have two choices – either to select this or not to select this.



Total number of choices = 2 × 2 × 2 = 8

Out of this we will remove one choice that has—No, No, No.

Hence, option (c) is the correct answer.

22. We can use the solution to Q. 21 as our base. We will keep on eliminating the options that are not applicable:

P1; P2; P3; P1 and P2; P1 and P3; P2 and P3; P1, P2 and P3

Condition 1: Both P1 and P2 have to be selected.

Hence, only possible selections = P1 and P2; P1, P2 and P3 ⟹ 2 choices.

Hence, option (b) is the correct answer.

23. Exhaustive sets = P1; P2; P3; P1 and P2; P1 and P3; P2 and P3; P1, P2 and P3

Condition 2: Either P1 or P3, but not both, has to be selected.

Hence, only possible selections = P1; P3; P1 and P2; P2 and P3 ⟹ 4 choices.

Hence, option (c) is the correct answer.

24. Possible selections as per condition 2 = P1; P3; P1 and P2; P2 and P3

Condition 3: P2 can be selected only if P3 has been selected ⟹ P3 can be selected alone, but P2 cannot be selected without the selection of P3.

Hence, only possible selections = P1; P3; P2 and P3 ⟹ 3 choices.

Hence, option (e) is the correct answer.

25. Possible selections as per condition 2 and condition 3 = P1; P3; P2 and P3

Condition 1: Both P1 and P2 have to be selected.

Hence, only possible selections = None.

Hence, option (a) is the correct answer.

Exercise 2

Solutions to Q.1 to 4:

There are 8 roles & 5 actors such that 2 are male actors & 3 are female actors. Role 1 & 2 are not played at same time. Both are to be played by male actor. So, same male actor can play both roles. Roles 3 & 7 are not played at same time & role 3 is to be played by a male actor. So, same male actor can play both roles. Also, roles 3 & 6, 4 & 8, 5 & 8 are not to be played at same time & so these 2 (in pairs) can be played by same actors. Also, roles 4, 5 & 6 must be played by female actors & role 8 can be played by male or female. There are 3 female actors. So, 1 of female actor must play either roles 4 & 8 or 5 & 8. Other 2 plays role 6 & role 4/5 (whichever is not played by female actor who also played role 8). So, we have 5 actors playing roles as:

(a) Role 1 & 2 are played by same male actor

(b) Roles 3 & 7 are played by same male actor

(c) Role 4/5(any 1 of 4 & 5) & 8 played by same female actor

(d) Role 6 played by a female actor

(e) Role 4/5 (any 1 of 4 & 5) played by a female actor

1. Role 1 & 2 are not played at same time. Both are to be played by male actor. So, same male actor can play both roles. Role 3 & 7 are not played at same time. Role 3 is to be played by male actor. Role 7 can be played by either male or female actor. So, if a male play Role 7, then same male actor can play both roles. Role 4 & 8 are not played at same time. Role 4 is to be played by female actor. Role 8 can be played by either male or female actor. So, if a female play Role 8, then same female actor can play both roles. So, option (a), (c) & (d) are not correct. Role 3 & 6 are not played at same time. But, Role 3 must be played by male actor while Role 6 must be played by female actor. So, Roles 3 & 6 cannot be played by the same actor

Hence, option (b) is the correct answer.

2. From general solution we know 1 of the male actor is playing roles 1 & 2. The other male actor is playing roles 3 & 7. As Ritesh is playing role 1, so he is also playing role 2. Every actor must play at least 1 role. So, Abhi must play roles 3 & 7. So, Abhi plays role 7

Hence, option (b) is the correct answer.

3. From general solution we know that roles 4, 5 & 6 are played by different female actors. So, options (a) & (b) are incorrect. Further we know that roles 4 & 6 are played together. It is also given that Rani & Shreya cannot play roles which require them to be together on stage. So, any 1 of them is neither playing role 4 nor 6. But in option (d), Shreya & Rani are playing roles

4 & 6 respectively, so this option is also incorrect. The given arrangement in option (c) is feasible as Shreya is playing role 5 (i.e. neither 4 nor 6)

Hence, option (c) is the correct answer.

4. From general solution we know that role 8 is played by a female actor. Abhi is male actor, so he cannot play role 8. He can play any of roles 1, 2 & 3 (also 7), but cannot play role 8

Hence, option (d) is the correct answer.

Solutions to Q.5 to 8:

5. None of the players can sit out 2 consecutive rounds. In options (a) & (c), Onir will sit out 2 consecutive rounds. So, these are incorrect options. In option (b), Mithun will sit out 2 consecutive rounds. So, it is incorrect option. Only option (d) is feasible

Hence, option (d) is the correct answer.

6. None of the players can sit out 2 consecutive rounds. So, the 2 players John & Onir, who were not in 1st round, must play in 2nd round. Only option (c) shows both John & Onir in 2nd round

Hence, option (c) is the correct answer.

7. If Ranbir & Onir did not played in 1st round, then the players who played in 1st round must be- John, Karan & Mithun. In 2nd round we must have- Ranbir, Onir & John/Karan/Mithun (i.e. any 1 from John, Karan & Mithun). If we assume 3rd person to be John (we can take any 1 of these 3 as we must focus on Ranbir & Onir & not of these 3). So, we can assume in 2nd round we have- Ranbir, Onir & John

To check option (a): Option (a) is incorrect as according to it, Ranbir played 3 consecutive rounds.

To check option (b): If we assume Onir played in round 3, then he cannot play in round 4 (as he cannot play in 3 consecutive rounds). But, he will play in round 5 (as cannot sit out 2 consecutive rounds). But, it is not necessary that he must play in round 3, as we can repeat any 1 from Ranbir, Onir & John (who played in round 2). So, we cannot say he must have played in round 3 & 5 (we can say that he could have played in round 3 & 5). So, option (b) is not correct

To check option (c): If we assume Ranbir & Onir played in round 4, then none of them played in round 3 (as then they would have played in 3 consecutive rounds 2, 3 & 4). But we can repeat any 1 from Ranbir, Onir & John (who played in round 2. So, option (c) is not correct. (Actually it cannot be said that it must be true, however, it can be true like option (b))

To check option (d): There may be 2 cases:

1. Neither Ranbir nor Onir is repeated in round 3 (after playing round 2). Then both of them must be repeated in round 4. Now only 1 of them can be repeated in round 5. So, any 1 of them can appear in 3 rounds. But, the other can appear in only 2 rounds. But, every player must appear in 3 rounds in game of 5 rounds. So, it is not possible
2. One of them (Ranbir or Onir) is repeated in 3rd round. Let this be Onir. Then Onir cannot be repeated in 4th round (as he will be in 3 rounds consecutively which is not possible). Now, the other one i.e Ranbir must play in 4th round (as no player can sit out in 2 consecutive rounds). Now Onir must play in round 5 (as no player can sit out in 2 consecutive rounds). Ranbir must also play in round 5 (as every player must appear in 3 rounds in game of 5 rounds). So, Onir plays in 2nd, 3rd & 5th round. Ranbir plays in 2nd, 4th & 5th round.

So, it is concluded that both Ranbir & Onir must play in round 5. So, option (d) is correct answer

8. Mithun played in both 1st & 2nd round. So, he cannot play in 3rd round (as he will be in 3 rounds consecutively which is not possible). Now, he must play in 4th round as no player can sit out in 2 consecutive rounds. Therefore, Mithun must play in the 4th round

Hence, option (d) is the correct answer.

Solutions to Q.9 to 11:

10. The liquid from 1st bottle turns Mitlus paper red, so it has either Pure Y or Y & Z. The liquid from 2nd bottle turns Mitlus paper yellow, so it has either Pure X &Y or X & Z. If we mix liquids from both the bottles, we get 3 possibilities-

a) X & Y – it will turn the Mitlus paper Yellow

b) X & Z – it will turn the Mitlus paper Yellow

c) X & Y & Z- it will turn the Mitlus paper Black

So, if we mix the liquids from both the bottles, the liquid will turn the Mitlus paper either black or yellow

Hence, option (d) is the correct answer.

11. The 1st bottle is either Pure Y or Y & Z as it turns the Mitlus paper red. The 2nd bottle is either Pure Z or X &Y & Z as it turns the Mitlus paper black. The mix from both bottles turns the Mitlus paper red, so the mix must be either Y or Y & Z. From these, it can be concluded that the mix is Y & Z. So, 1st bottle is either only Y or Y & Z. The 2nd bottle must be only Z (it cannot be X & Y & Z). Option (d) is correct

Solutions to Q.12 to 15:

12. R works for HomeTrade only. S works for Goodday & HomeTrade only. We know HomeTrade employs exactly 2 employees. So, HomeTrade has employed R & S. We also know that Q works for Fargo & at least 1 of the other company. So, Q must be working for Goodday too (but not for HomeTrade as it has exactly 2 research associates). Goodday employs either 1 or 2 research associates. So, Goodday has employed 2 research associates S & Q. T can work for Fargo only (other 2 companies are already having 2 research associates with them)

Hence, option (a) is the correct answer.

13. Q always works for Fargo & at least 1 of the other companies. It is also given that Q & R both work for the same 2 retail companies. So, 1 of these companies must be Fargo & other is either Goodday or HomeTrade. Fargo 7 HomeTrade employs exactly 2 people & Goodday can employ 1 or 2 people. So, in this case Goodday must employ 2 people. We also know each person must work in at least 1 company. So, both S & T are working in exactly 1 company & they are working in Goodday & HomeTrade such that exactly 1 of them is working in HomeTrade & other person is working in Goodday. So, for T we can conclude that he/she is working in either Goodday or HomeTrade but not in both

Hence, option (d) is the correct answer.

14. Only S works for Goodday. So, Goodday has employed only 1 person (S). Now, both Fargo & HomeTrade employs exactly 2 people each. Q always works for Fargo & at least 1 of the other companies. So, Q is working for both Fargo & HomeTrade. We also know each person must work in at least 1 company. So, both R & T are working in exactly 1 company & they are working in Fargo & HomeTrade such that exactly 1 of them is working in HomeTrade & other person is working in Fargo. So, we can conclude that R & T cannot work for the same company

Hence, option (c) is the correct answer.

15. We are given that Goodday employs only 1 detective. We also know that both Fargo & HomeTrade employs exactly 2 people each. Q always works for Fargo & at least 1 of the other companies. So, Q is working for both Fargo & HomeTrade. We also know each person must work in at least 1 company. So, each one of R, S & T are working in exactly 1 company. But, we do not know who is working for which company. So, only III is correct

Hence, option (c) is the correct answer.

Solutions to Q.16 to 19:

16. In option (a) & (c) there is no fish of species K while there is fish of species G. So, both (a) & (c) are incorrect options. We cannot keep fish of species K with F (fish of species F fights with fish of species K). So, option (b) is incorrect. In option (d) no condition is violated

Hence, option (d) is the correct answer.

17. Fish of species I cannot be kept with fish of species J. So, option (d) is incorrect. If we keep G, then K must also be kept, so option (b) is incorrect. Fish of species F will fight with fish of species J. So, option (a) is incorrect. We can keep 3 fishes of species H with 3 fishes of species J

Hence, option (c) is the correct answer.

18. If we keep fish of the species F, then we cannot keep fish of species H, J or K. So, the 4 species will be F, G, I & L. Fish of species I & G cannot be kept together & we must also keep fish of species K with fish of species G. So, we can conclude that, if we keep fish of species F, we cannot keep 4 different species. Correct option is (a)

19. If there is fish of species G, we must also have fish of species K. So, options (a), (b) & (c) are incorrect options as K is not present in these options

Hence, option (d) is the correct answer.

Solutions to Q.20 to 25:

20. If X is selected for a House, Y must also be selected for that house. But in options (a), (b) & (c) X is selected but Y is not selected. So, these are incorrect options

Hence, option (d) is the correct answer.

21. The 2 House must have at least 1 member in common, so option (a) is incorrect. If X is selected for a house, Y must also be selected for that House. But in options (b) & (c) Y is not selected for the House for which X is selected. So, these are incorrect options

Hence, option (d) is the correct answer.

22. If we want to have as many members in common in both Houses as possible, then we should have all 3 common members in both Houses. So, members of Lower House are V, W & Z

Hence, option (b) is the correct answer.

23. None of the members of Upper House can yield his or her place to X, as we must also have Y with X. So, there will be at least 2 changes needed (in next change Y will be added to Upper House). W from Lower House cannot yield his or her place to X, as he or she is only member between both Houses. Y from Lower House cannot yield his or her place to X, as he or she must also be present with X in same house. Only Z can be replaced by X

Hence, option (d) is the correct answer.

24. Only common member for both Houses is Z. U & X are each selected for a house. So, we can conclude that one of the houses must have X, Y & Z are its 3 members (as it already has X & Z, we must keep Y with X). The other house has U & Z as its 2 members. The 3rd member may be W or V. So, we can say that U must be selected for a different house than Y

Hence, option (c) is the correct answer.

25. If X & Z are selected for Upper House, then the 3 members of Upper House are X, Y & Z (as Y also be selected for the house for which X is selected). One of the members of Lower House is U. If we choose V & W as 2 other members, and then there cannot be any common member in both houses. But, we must have at least 1 common member in both houses. So, V & W cannot be selected

Hence, option (a) is the correct answer.