4

Team Formations

Team formation questions are another question type which are commonly seen in most exams. The questions consist typically of a group of people/objects that have to be put together in teams— albeit with a set of constraints/conditions about certain people who need to be put together/ cannot be put together in a team.

The key skills involved in solving team formation questions would involve the following:

(i) The ability to visualise the structure of the teams to be formed including the number of people/objects in each team

(ii) The ability to order the clues in the correct order of usage (as explained in the theory of logical reasoning)

(iii) The ability to create symbolic representations of the various clues provided so that you can bring together each of the relevant clues while creating the teams

(iv) The ability to wait for and reach the appropriate time in the problem solving situation from where the indirect clues provided in the question can be used.

Illustrated below are the solutions to a few typical questions on team formations. We would urge you to first have a look at the questions and try to solve the same on your own before looking at the solutions.

Example 1

Directions for Questions 1 and 2: Read the information given below and answer the questions.

A director is casting a movie about twins.Selection must be made from among nine people—Amartya, Bhupesh, Caruna, Divya, Elangovan, Farly, Girish, Harish, and Isha. Amartya is Bhupesh's twin, Caruna is Divya's twin, and Elangovan is Farly's twin. Girish, Harish and Isha may each be selected only as "extras."

∑ At least two pairs of twins must be selected.

∑ At least as many women as men must be selected.

∑ Amartya and Bhupesh must both be selected if either is selected.

Σ Caruna and Divya must be selected if either is selected.

Σ Elangovan and Farly need not both be selected.

Σ At least one "extra" must be selected.

Σ Amartya, Bhupesh, Elangovan, Girish and Harish are men.

1. Which of the following is an acceptable cast for the movie?

   (a) Amartya, Bhupesh, Elangovan, Farly, Isha

   (b) Caruna, Divya, Farly, Girish, Harish, Isha

   (c) Bhupesh, Caruna, Divya, Elangovan, Harish, Isha

   (d) Caruna, Divya, Elangovan, Farly, Girish, Harish, Isha

2. Which of the following people must be included in the cast?

   (a) Divya   (b) Isha

   (c) Farly   (d) Harish

Solution:

To solve this we will create a diagram where men will be denoted by upper case letter and women with lower case letters and we will list the extras separately to avoid confusion. Here given that Caruna and Divya must both be selected because if they were not selected then Amartya and Bhupesh or Elangovan and Farly (three of whom are men) would all be selected; as a result only two women Farly and Isha at most will be selected. However according to the constraints at least as many women as men must be selected, thus Caruna and Divya must both be selected.

$$[\text{A B}] \quad [\textcircled{c}\ \textcircled{d}] \quad [\text{E / F}]$$

$$\text{G H i } [\geq 1]$$

$$\text{women} \geq \text{MEN}$$

1) Eliminate each options using the clues given in the information. Only option (d) suffices. Hence option (d) is the correct answer.

2) Caruna and Divya must both be selected. Hence option (a) is the correct answer.

Example 2 Vijayshree wants to take four courses this trimester. There are only seven courses in which she is interested: three marketing courses – Distribution, Advertising and PR; and four Finance courses— International Finance, Accounting, Corporate Finance and Financial Services. To meet college requirements she must take two marketing courses. There are some scheduling problems: International Finance overlaps both Advertising and Corporate Finance but she can choose Advertising and Corporate Finance as two different courses. Distribution is given at the same time as Accounting.

1. If Vijayshree decides she will take International Finance, what will her other three courses be?

   (a) Distribution, PR and Advertising

(b) Distribution, PR and Financial Services

(c) Distribution, PR and Accounting

(d) PR, Advertising and Financial Services

2. If Vijayshree takes four courses this trimester, then which of the following statement is not possible?

I. She takes Accounting and does not take Advertising.

II. She takes Corporate Finance and does not take Advertising.

III. She takes International Finance and does not take PR.

(a) I only
(b) II only

(c) III only
(d) I and III only

3. Which of the following must always be true?

I. Vijayshree must take PR if she takes Corporate Finance.

II. Vijayshree must take Advertising if she takes Accounting.

III. Vijayshree must take Accounting if she takes Advertising.

(a) I, II, and III
(b) II, and III only

(c) I and II only
(d) II only

Solution:

(1) It can be seen that if she takes International Finance, she would not be able to take the Advertising and Corporate Finance course. This means that she has to choose Distribution and PR as her two marketing courses and because Distribution overlaps with Accounting, her second finance course must be Financial Services. Option (b) is correct.

(2) Statement I is definitely not possible because if she takes Accounting she cannot take Distribution and she must have to take Advertising.

Statement II is possible, while statement III can be seen to not be possible as if she takes International Finance she has to take PR as Advertising would not be available to her.

Option (d) is correct.

(3) Statement I is not necessarily true as if she takes Corporate Finance she can take up Distribution and Advertising and skip PR. i.e. PR is not necessary if she has taken Corporate Finance.

Statement II is mandatorily true because if she takes Accounting, she cannot take Distribution and hence she would be forced to take up Advertising as one of her two compulsory marketing courses. Statement III is not necessarily true. Thus option (d) is correct.

Example 3

Directions for Questions 1 to 3: Answer the questions based on the following information.

At Semco, Ricardo Semlar has perfected the art of employee motivation. Due to this, his staff works 7

days a week. However, he has given them the leeway that in every week they are allowed to work for the company on any 4 days and for the remaining 3 days of the week every employee is allowed to work on his own entrepreneurial project. On a particular day, Mr. Semlar was looking closely at the functioning of 3 of his most trusted executives and found out a few facts about their weekly schedule.

Each of them work for the company only 4 days a week and work on their own projects for 3 days every week.

All the three executives work together (for the company) only once in a week.

None of them works for the company for 3 consecutive days.

Amit works on his project on Tuesdays, Thursdays and Sundays.

Bimlesh works on his own project on Saturday.

Chetan does not work for the company on Fridays and Sundays.

No two executives have an own project work day on the same day more than once a week.

At least 1 person works for the company everyday of the week.

1. On which day of the week do all the three executives work together?
   (a) Monday
   (b) Wednesday
   (c) Friday
   (d) Cannot be determined

2. Which of the following days does Chetan work on his own project?
   (a) Monday
   (b) Tuesday
   (c) Wednesday
   (d) Thursday

3. Which of the following days is surely a company working day for Bimlesh?
   (a) Wednesday
   (b) Friday
   (c) Sunday
   (d) Cannot be determined

Solution:

The following table emerges from the given conditions: (P denotes working on own project)

	Amit	Bimlesh	Chetan
Monday			
Tuesday	P		
Wednesday			P
Thursday	P		
Friday			P
Saturday		P	
Sunday	P		P

Note: Chetan's third P is on Wednesday because it cannot be on Tuesday or Thursday (as in that case Chetan and Amit would be working on their projects together on two days of the week.) Also, Chetan's third P cannot be on Monday in which case Chetan would be working continuously for the company for 3 days.

Thus, the answers are:

1. Option (a) (Monday)
2. Option (c) (Wednesday)
3. Sunday is necessarily a company working day for Bimlesh. Option (c) is correct.

Example 4 Study the following information carefully and answer the questions given below:

7 friends A, B, C, D, L, M and Z are going to a new year's party on mobikes in Goa. Since it is late at night they do not anticipate any police presence and hence have taken only 3 bikes – an Enfield, a Honda and a TVS, with at least 2 of them sitting on each bike (hence there is triple riding on at least 1 bike). There is exactly one male on each bike. Amongst the group there are two executives, two designers and three psychologists among them.

(i) C is a lady designer and she does not travel with the pair of sisters, A and M.

(ii) B, a male executive, travels with only Z, a psychologist on an Enfield bike.

(iii) D is a male designer.

(iv) Two persons belonging to the same profession do not travel on the same bike.

(v) A is not an executive and travels on the Honda.

1. What is M's profession?

    (a) Executive   (b) Psychologist

    (c) Designer   (d) Data inadequate

2. On which bike does C travel?

    (a) Enfield   (b) Honda

    (c) TVS   (d) Either Honda or TVS

3. Which of the following represents the three psychologists?

    (a) ZLM   (b) ZLA

    (c) ZLM or ZLA   (d) None of these

Solution:

We start from clue (ii) and get the following table:

Enfield	Honda	TVS
B Z		
Executive		
Psychologist		

(Note we can conclude that Z is a female because there is exactly 1 male on each bike). We denote females in our figures with an underline.

We further know that A and M are sisters and C is a lady designer. Since 2 persons with the same profession cannot travel together, D and C must be traveling on different bikes. Thus, D should be clubbed with A & M. Also, since A is on a Honda, the Honda should have 3 people A, M and D.

Enfield	Honda	TVS

B Z	A M D	C L
Executive – Psychologist	?, ?, Designer	Designer, ?

From this point in the solution, we need to concentrate only on the professions of A, M and L. We also know that we are yet to identify 1 executive and 2 psycholoigsts. Further, according to the constraint of clue (iv) both A and M cannot be psychologists. Thus, L must be a psychologist. Also, since, we know that A is not an executive we can conclude that A must be a psychologist and the final table emerges as follows:

Enfield	Honda	TVS
B Z	A M D	C L
Executive – Psychologist	Psychologist, Executive, Designer	Designer, Psychologist,

The answers are:

1. Executive. Option (a) is correct.
2. On the TVS. Option (c) is correct.
3. Z, L and A represent the three psychologists. Option (b) is correct.

Example 5

Direction for Questions 1 to 3: Study the following information carefully to answer the questions given below:

Examinations of eight papers were conducted in a week, from Monday to Saturday. The papers were: Advertising, Biology, Chemistry, Distribution, Quantitative Techniques, Finance, Marketing and Heuristics. Not more than two papers were organised in a day. Only one of the days, during Monday to Saturday, was the rest day. The paper on Distribution was held just before the Finance paper, but immediately after the Heuristics paper. It is also known that there was no rest day between any two of these three papers. The tests were split equally between the days before the rest day and the days after the rest day, i.e., tests of four papers were held before the rest day whereas four papers were held after the rest day. Thursday was not the rest day. Quantitative Techniques and Finance were held on the same day. The paper on Heuristics was not held either on Thursday or on Friday. The papers on Marketing and Biology were held just before Advertising and Chemistry respectively. The paper on Advertising was held just before the paper on Biology.

1. Examinations of which papers were held on Monday?

    (a) Heuristics and Distribution

    (b) Distribution and Finance

    (c) Marketing and Advertising

    (d) Can't be determined

2. Which of the following days was the rest day?

    (a) Tuesday   (b) Wednesday

    (c) Thursday   (d) Can't be determined

3. Examination(s) of which of the following papers was /were held on Friday?

   I. Marketing

   II. Advertising

   III. Biology

   IV. Chemistry

   (a) Only II

   (b) Only III

   (c) Either II or III or both II and III

   (d) Both II and III

Solution:

The thinking in this question would go as follows:

From the statements "Examinations of eight papers were conducted in a week, from Monday to Saturday. Not more than two papers were organised in a day & only one of the days, during Monday to Saturday, was the rest day." We realise:

8 papers are conducted in 5 days with not more than 2 papers on any single day. This means that there must be exactly 3 days when 2 papers each are conducted.

Further when we read "Tests of four papers were held before the rest day whereas four papers were held after the rest day", we realise that there must be at least 2 days before the rest day and 2 days after the rest day. This obviously means that the rest day must be either on Wednesday or on Thursday.

Also as we go further down the problem we realise: "Thursday was not the rest day." We realise that the rest day must be on Wednesday. Thus, both Monday and Tuesday must have had 2 exams each.

From the statements: "The papers on Marketing and Biology were held just before Advertising and Chemistry respectively. The paper on Advertising was held just before the paper on Biology." We get that **Marketing-Advertising-Biology-Chemistry** must be the order for these 4 subjects and also that there must not be any other paper between these 4 papers.

At this point we know the following structure of the respective days and the papers on each day:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
2 Papers	2 Papers	REST DAY			

In the above figure we also know that between Thursday to Saturday exactly one day has 2 papers. Thus, there could be 2 papers on any one of the days viz: Thursday, Friday or Saturday.

Further using the statements "The paper on Distribution was held just before the Finance paper, but immediately after the Heuristics paper. It is also known that there was no rest day between any two of these three papers & Quantitative Techniques and Finance were held on the same day. The paper on Heuristics was not held either on Thursday or on Friday." We get:

Heuristics-Distribution-Finance-Quantitative Techniques as one order of papers which can either be placed before the rest day or after. However, if we were to try to place these 4 papers after the

rest day, we would need to put Heuristics on Thursday which contradicts the conditions of the problem. Thus, these 4 papers can only be assigned to Monday and Tuesday (2 papers each). This also means that: **Marketing-Advertising-Biology-Chemistry** must be after the rest day.

Based on these conclusions there are 3 possible ways in which the exams can be structured (depending on which day we use for putting 2 papers after Wednesday). These are

Possibility 1:

Monday	Heuristics	Distribution
Tuesday	Finance	QT
Wednesday	REST DAY	
Thursday	Marketing	
Friday	Advertising	Biology
Saturday	Chemisty	

Possibility 2:

Monday	Heuristics	Distribution
Tuesday	Finance	QT
Wednesday	REST DAY	
Thursday	Marketing	
Friday	Advertising	
Saturday	Biology	Chemisty

Possibility 3:

Monday	Heuristics	Distribution
Tuesday	Finance	QT
Wednesday	REST DAY	
Thursday	Marketing	Advertising
Friday	Biology	
Saturday	Chemisty	

The answers can be read off from the tables (based on what is correct for each of these possibilities):

1. Heuristics and distribution are always on Monday. Option (a) is correct.
2. Wednesday is the rest day in all possibilities. Option (b) is correct.
3. It could be either Biology (possibility 3) or Advertising (possibility 2) or both (possibility 1). Option (c) is correct.

EXERCISE ON TEAM FORMATION

Directions for Questions 1 to 3:

i. A guest house has 6 rooms A, B, C, D, E, and F. Among these A and C can accommodate two persons each; the rest can accommodate only one each.

ii. Eight guests P, Q, R, S, T, U, W and X are to be kept in these rooms. Q, T and X are females while the rest are males. The two sexes can't be put together in the same room. No man is willing to stay in room C or F.

iii. P wants to be alone but does not want to stay in rooms B or D. S needs a partner but is not ready to stay with U or W. X does not want to share her room.

1. Who among the following will stay in room E?

(a) U   (b) W

(c) P   (d) Data inadequate

2. In which of the following rooms will U stay?

(a) B   (b) D

(c) A   (d) B or D

3. X will stay in which of the following rooms?

(a) C   (b) F

(c) B   (d) Data inadequate

Directions for Questions 4 to 8:

i. M, N, P, Q, S, and T are six members of a group in which there are three female members. Females work in three departments – Accounts, Administration and Personnel, and sit on three different floors – I^{st}, IInd, IIIrd. Persons working in the same department are not on the same floor. Two persons work on each floor.

ii. No two females work in the same department or on the same floor. N and S work in the same department but not in Personnel. Q works in Administration. S and M are on the Ist and IIIrd floors respectively and work in the same department. Q, a female, does not work on the IInd floor, P, a male, works on Ist floor.

4. Which of the following groups of persons are females?

(a) SQT   (b) QMT

(c) QPT   (d) Data inadequate

5. Which of the following pairs of persons work in Administration?

(a) QP   (b) QN

(c) SP   (d) Data inadequate

6. T works in which department?

(a) Accounts

(b) Administration

(c) Personnel

(d) Accounts or Personnel

7. Which of the following pairs work on the IInd floor?

(a) PT   (b) SM

(c) QN   (d) NT

8. If T is transferred to Accounts and S is transferred to Administration, who is to be transferred to Personnel to maintain the original distribution of females on each floor?

(a) P
(b) N

(c) Q
(d) Data inadequate

Directions for Questions 9 to 13: A, B, C, D, E, F, and G are travelling in three different vehicles. There are at least two passengers in each vehicle—Maruti, Santro, Opel, and only one of them is a male. There are two engineers, two doctors and three teachers among them.

i. C is a lady doctor and she does not travel with the pair of sisters A and F.
ii. B, a male engineer, travels with only G, a teacher in a Maruti.
iii. D is a male doctor.
iv. Two persons belonging to the same profession do not travel in the same vehicle.
v. A is not an engineer and travels in a Santro.

9. What is F's profession?

(a) Engineer
(b) Doctor

(c) Teacher
(d) Data inadequate

10. In which vehicle does C travel?

(a) Maruti
(b) Santro

(c) Opel
(d) Data inadequate

11. Which of the following represents the three teachers?

(a) GEF
(b) GEA

(c) GBF
(d) Data inadequate

12. How many Iady members are there among them?

(a) Three
(b) Four

(c) Three or four
(d) Data inadequate

13. Which of the following is not correct?

(a) E-Male-Teacher
(b) B-Male-Engineer

(c) A-Female-Teacher
(d) All are correct

Directions for Questions 14 to 19: Ten students— A, B, C, D, E, F, G, H, I and J are chosen to represent their college in four sports— tennis, badminton, table tennis and snooker. The badminton team has one student less than the tennis team. A, B and C are not tennis players, individually or as a group. D, E and F are not in badminton team individually or as a group. G, H and I are not in the table tennis team, individually or as a group. J is a table tennis player. None of the students is a snooker player.

14. Which of the following students could be table tennis players?

(a) J, B & G
(b) J, C & F

(c) J , D, E & F   (d) J, B, C & D

15. Of those listed, what is the largest possible number of students who could be table tennis players?

    (a) 6   (b) 7

    (c) 9   (d) None of these

16. If no other student except I is in the badminton team, which of the following students could be tennis players?

    (a) D and H   (b) F and E

    (c) E and G   (d) G and H

17. If the table tennis team has one member, who of the following must be a tennis player?

    (a) A   (b) B

    (c) D   (d) G

18. If G, H and C are the only students in the badminton team, which three must be the only students who are table tennis players?

    (a) A, B and J   (b) A, D and J

    (c) B, E and J   (d) B, F and J

19. If A and G are the only badminton players, how many students must be in the table tennis team?

    (a) 2   (b) 3

    (c) 5   (d) 6

20. There are ten animals— two each of lions, panthers, bisons, bears and deer, in a zoo. The enclosures in the zoo are named X, Y, Z, P and Q and each enclosure is allotted to one of the following attendants: Jack, Mohan, Shalini, Suman and Rita. Two animals of different species are housed in each enclosure. A lion and a deer cannot be together. A panther cannot be with either a deer or a bison. Suman attends to animals from among bison, deer, bear and panther only. Mohan attends to a lion and panther. Jack does not attend to deer, lion or bison. X, Y and Z are allotted to Mohan, Jack and Rita respectively. X and Q enclosures have one animal of the same species. Z and P have the same pair of animals.

    The animals attended by Shalini are:

    (a) Bear & Bison   (b) Bison & Deer

    (c) Bear & Lion   (d) Bear & Panther

21. Eight people carrying food baskets are going for a picnic on motorcycles. Their names are A, B, C, D, E, F, G and H. They have four motorcycles Ml, M2, M3 and M4 among them. They also have four food baskets O, P, Q and R of different sizes and shapes and each can be carried only on motorcycles Ml, M2, M3, or M4 respectively. No more than two persons can travel on a motorcycle and no more than one basket can be carried on a motorcycle. There are

two husband-wife pairs in this group of eight people and each pair will ride on a motorcycle together. C cannot travel with A or B. E cannot travel with B or F. G cannot travel with F, H or D. The husband-wife pairs must carry baskets O and P. Q is with A and P is with D. F travels on Ml and E travels on M2 motorcycles. G is with Q, and B cannot go with R.

Who is travelling with H?

(a) A

(b) B

(c) C

(d) D

22. In a "keep-fit" gymnasium class there are fifteen females enrolled in a weight-loss programme. They all have been grouped in any one of the five weight-groups—Wl , W2, W3 W4 or W5. One instructor is assigned to one weight-group only. Sonali, Shalini, Shubhra and Shahira belong to the same weight-group. Sonali and Rupa are in one weight-group. Rupal and Renuka are also in one weight-group. Rupa, Radha, Renuka, Ruchika and Ritu belong to different weight-groups. Somya cannot be with Ritu, and Tara cannot be with Radha. Komal cannot be with Radha, Somya or Ritu. Shahira is in W1 and Somya is in W4 with Ruchika Sweta and Jyotika cannot be with Rupali, but are in a weight-group with total membership of four. No weight-group can have more than five or less than one member. Amita, Babita, Chandrika, Deepika and Elina are instructors of weight-groups with membership sizes 5,4,3,2 and 1, respectively. Who is the instructor of Radha?

(a) Babita

(b) Elina

(c) Chandrika

(d) Deepika

23. A King enjoys unflinching loyalty from eight of his ministers M1 to M8, but he has to select only four to make a cabinet committee. He decides to choose these four such that each selected person shares a liking with at least one of the other three selected. The selected person must also hate at least one of the likings of any of the other three persons selected.

(i) M1 likes fishing and smoking, but hates gambling;

(ii) M2 likes smoking and drinking, but hates fishing;

(iii) M3 likes gambling, but hates smoking;

(iv) M4 likes mountaineering, but hates drinking;

(v) M5 likes drinking, but hates smoking and mountaineering;

(vi) M6 likes fishing, but hates smoking and mountaineering;

(vii) M7 likes gambling and mountaineering, but hates fishing; and

(viii) M8 likes smoking and gambling, but hates mountaineering;

Who are the four people selected by the King?

(a) M1, M2, M5, M6

(b) M3, M4, M5, M6

(c) M4, M5, M6, M8

(d) Ml, M2, M4, M7

Directions for Questions 24 to 26: (Constraint Based Selection) A group of three or four has to be

selected from seven persons. Among the seven there are two women—Fiza. and Kavita, and five men —Ram, Shyam, David, Peter and Rahim. Ram would not like to be in the group if Shyam is also selected. Shyam and Rahim want to be selected together in the group. Kavita would like to be in the group only if David is also there. David, if selected, would not like Peter in the group. Ram would like to be in the group only if Peter is also there. David insists that Fiza be selected in case he is there in the group.

24. Which of the following is a feasible group of three?

   (a) David, Ram, Rahim

   (b) Peter, Shyam, Rahim

   (c) Kavita, David, Shyam

   (d) Fiza, David, Ram

25. Which of the following is a feasible group of four?

   (a) Ram, Peter, Fiza, Rahim

   (b) Shyam, Rahim, Kavita, David

   (c) Shyam, Rahim, Fiza, David

   (d) Fiza, David, Ram, Peter.

26. Which of the following statements is true?

   (a) Kavita and Ram can be part of a group of four.

   (b) A group of four can have two women.

   (c) A group of four can have all four men.

   (d) None of the above.

Directions for Questions 27 to 28: Read the information given below and answer the questions that follow.

At a secret location in Nevada, a science lab exists where four research projects ROC-I, ROC-II ROC-III and ROC-IV are underway. The projects are assigned difficulty level L1 or L2 or L3. A total of six researchers who are given code names in order to protect their identity are—Ax, Bx, Cx, Dx Ex and Fx—are chosen for working on the projects with the provision that for the project of difficulty level L1 only one research associate will be engaged while for the other projects two researchers will be engaged. There are, however, some constraints to be overcome before allotting the work.

   A.   Ax, Bx and Dx do not work with each other.

   B.   Projects ROC-II and ROC-III are of difficulty level L_2/L_3. Remaining projects are of L_1 level.

   C.   Ex cannot work with anyone else.

   D.   Cx and Dx cannot work together.

   E.   Fx can work either with Dx or Cx only.

   F.   Fx cannot be engaged in L^3 level projects.

   G.   Ax and Cx cannot work together.

27. Researcher Ax can be allotted which of the following projects?

(a) ROC-I or ROC-II but not ROC-III

(b) ROC-II or ROC-III but not ROC-IV

(c) ROC-III or ROC-IV but not ROC-I

(d) ROC-IV or ROC-I but not ROC-II

28. If researcher Fx is engaged neither for ROC-I nor for ROC-II, and it is also known that B
works in Project III, then assignments for how many of the six researchers can be decided?

(a) 2   (b) 4

(c) 3   (d) All

Directions for Questions 29 and 30: Study the information given below and answer the questions
that follow.

If Mayank goes to Singapore he makes Neha or Omar (but not both of them) also to go to Singapore
Ravi goes to Singapore only if Omar goes. Pawan goes to Singapore if Neha or Omar goes. Shawn
goes to Singapore only if Neha goes. Varun goes to Singapore only if Ravi or Shawn goes. If Pawan
goes to Singapore, he makes Tanvi or Unni or both to accompany him. Tanvi goes to Singapore if
Shawn goes. Unni goes to Singapore only if Ravi goes.

29. If Mayank has gone to Singapore, who of the following may have also gone to Singapore?

A. Ravi and Unni   B. Shawn and Tanvi

C. Pawan

(a) A, B and C

(b) A and C *or* B and C but not both

(c) A only

(d) B only

30. If Varun has gone to Singapore, who of the following must have also gone?

(a) Both Ravi and Shawn

(b) Both Neha and Omar

(c) Either Omar or Neha

(d) Ravi

Directions for Questions 31 and 32: Read the following information carefully and answer the
questions given below.

Amir, Bikram, Charlie, David, Emraan, Fahim and Gaurav are seven students in a class. They are
sitting on three benches— Mahogany, Oak and Maple in such a way that there is at least two of them
on each bench and there is at least one girl on each bench. Charlie, a girl student, does not sit with
Amir, Emraan and David. Fahim, a boy student, sits only with Bikram. Amir sits with his best friend
on bench Mahogany. Gaurav sits on bench Maple. Emraan is the brother of Charlie.

31. How many girl students are there?

    (a) 3 (b) 4

    (c) 3 or 4 (d) None of these

32. Which of the following is a group of girls?

    (a) Bikram, Amir and Charlie

    (b) Bikram, Fahim and Charlie

    (c) Charlie, David and Fahim

    (d) Bikram, Charlie and David

Directions for Questions 33 to 35: Study the following information carefully and answer the questions given below:

Geetika, Deep, Niharika, Shwetabh, Akansha, Aishwarya and Aparajita are travelling in three vehicles. There are at least two passengers in each vehicle—Maruti, Santro and Octavia and only one of them is a male. There are two engineers, two doctors and three teachers among them.

(i) Niharika is a lady doctor and she does not travel with the pair of sister, Geetika and Aishwarya.

(ii) Deep, a male engineer, travels with only Aparajita, a teacher in a Maruti.

(iii) Shwetabh is a male doctor.

(iv) Two persons belonging to the same profession do not travel in the same vehicle.

(v) Geetika is not an engineer and travels in vehicle Santro.

33. What is Aishwarya's profession?

    (a) Engineer (b) Teacher

    (c) Doctor (d) Data inadequate

34. In which vehicle does Niharika travel?

    (a) Maruti (b) Santro

    (c) Octavia (d) Santro or Octavia

35. Which of the following represents the three teachers?

    (a) Aparajita, Akansha and Aishwarya

    (b) Aparajita, Akansha and Geetika

    (c) Aparajita, Akansha and Aishwarya or Aparajita, Akansha and Geetika

    (d) Data inadequate

Directions for Questions 36 and 37: Study the following information carefully and answer the questions given below:

I. G, H, I, J, K, L, M and N are eight students in a class. Three of them play cricket and badminton each and two of them play hockey. Each one of them has a different height.

II. The tallest does not play hockey and the shortest does not play cricket.

III. L is taller than G and J but shorter than N and H. K, who does not play cricket, is taller than H and is second to the tallest. M is shorter than J but taller than G.

IV. N, who is the fourth from the top, plays badminton with J.

V. M does not play either cricket or hockey. H does not play hockey.

36. Which of the following pairs of students plays hockey?

    (a) K & L   (b) N & K

    (c) N & L   (d) None of these

37. What is L's position from the top when they are arranged in descending order of their height?

    (a) Third   (b) Fifth

    (c) Fourth   (d) None of these

Directions for Questions 38 and 39: Study the following information carefully and answer the questions given below:

Bali, Chinkara, Dabang, Fateh, Giri, Himesh and Jeev are seven students studying in three colleges IIM A, IIM B and IIM R. There are three boys and four girls. There are at least one boy and one girl in each college. Three of them are in HR discipline and two each in Finance and Marketing. Bali and her sister Giri are in Marketing but in different colleges. Fateh studies Finance in college IIM B and he does not study with either Jeev or Chinkara. Dabang is not in HR and he studies in college IIM R only with Bali. All the three from HR do not study in the same college. Himesh studies in the same college with her friend Giri.

38. In which college do only HR students study?

    (a) None   (b) IIM B

    (c) IIM R   (d) IIM A

39. If Chinkara and Bali interchange their colleges satisfying all other conditions, which of the following will definitely represent the girls?

    (a) Bali, Chinkara, Himesh and Dabang

    (b) Bali, Chinkara, Himesh and Giri

    (c) Bali, Fateh, Himesh and Giri

    (d) Dabang, Chinkara, Himesh and Fateh

Directions for Questions 40 and 41: Study the following information carefully and answer the questions given below:

Seven specialist persons Bebe, Meme, Keke, Pepe, Dede, Fefe and Hehe visit an office on four days — Tuesday, Wednesday, Friday and Saturday, in a week. At least one person but not more than two persons visit the office on each of these days. Each of them is a specialist in different fields— Paramedic, Business, Engineering, Genetics, Biometrics, Defense and Biotech.

    (i) Pepe visits on Friday with a specialist in Defence.

(ii) The Engineer does not visit on Saturday nor with Dede and Hehe.

(iii) The Biotech specialist Fefe visits alone on Tuesday.

(iv) Meme visits on Wednesday and he is not engineer.

(v) Keke visits on Wednesday. Hehe is not a specialist in Defence.

(vi) The engineer visits with the paramedic specialist.

(vii) The genetics specialist visits on Friday.

(viii)Bebe is neither Business specialist nor a specialist in Defence.

40. What is the speciality of Bebe?

    (a) Biometrics   (b) Paramedics

    (c) Engineer   (d) Data inadequate

41. On which day of the week does Dede visit?

    (a) Wednesday

    (b) Saturday

    (c) Wednesday or Saturday

    (d) Friday

Directions for Question 42: Study the information and answer the question.

Alexis, Benny, Carena and Davis—four executives are to be sent to four countries—Afghanistan, Pakistan, Japan and China to head the company's operations there, not necessarily in that order. Four assistants—Dave, Catty, Billy and Arnold, are also to be sent, one to each country. Following facts are known:

A. Alexis does not like Billy and Dave.

B. Dave and Arnold are not to be considered for Pakistan.

C. Billy and Catty are not to be considered for Afghanistan.

D. Benny would not go to Pakistan or Japan.

E. Davis loves to work with Catty.

F. China operations would not be headed by someone whose name ends in 's'.

G. Arnold and Catty would not go to China.

H. Benny has excelled in working with Dave earlier and hence would like him as his assistant.

I. Davis has built up good contacts in Japan and is considered a specialist for that country. (Sure posting is expected.)

    Which of the following postings is possible?

    (a) Afghanistan-Davis-Catty

    (b) Pakistan-Carena-Billy

    (c) China-Benny-Billy

    (d) Pakistan-Alexis-Catty

Answer Key

1. (c)	2. (d)	3. (b)	4. (a)
5. (d)	6. (c)	7. (d)	8. (c)
9. (a)	10. (c)	11. (b)	12. (b)
13. (d)	14. (b)	15. (b)	16. (d)
17. (c)	18. (a)	19. (c)	20. (c)
21. (c)	22. (b)	23. (d)	24. (b)
25. (c)	26. (d)	27. (d)	28. (c)
29. (b)	30. (c)	31. (c)	32. (d)
33. (a)	34. (c)	35. (b)	36. (d)
37. (b)	38. (d)	39. (b)	40. (a)
41. (d)	42. (b)		

Solutions

Questions 1 to 3

Initial information:

        A (2)
        B (1)
        C (2)
        D (1)
        E (1)
        F (1)

Also, P, Q, R, S, T, U, W, X (Underlined shows female). From Clue 2, Room C (2 people) and Room F (1 person) should be women's rooms as men cannot be placed there. From Clue 3—P must be in E. S must be in A (where U and W cannot be). Thus S must be sharing his room with R. Also U and W must be in some random order in Rooms B or D. Also, X must be in Room F as she is a female and wants a single room.

Collating all this we get:

        A (2) S, R
        B (1)
        C (2) Q, T
        D (1)
        E (1) P

F (1) X

Hence, the answers are:

1. P (c)
2. B or D (d)
3. F (b)

Questions 4 to 8

From the first clue we know that:

Six people M, N, P, Q, S & T

3 departments for females: Accounts, Admin and Personnel.

3 floors (2 people each)

		III
		II
		I

Using the direct information in clue 2 we get:

M	Q-	III
		II
S	P +	I

Note: (– Denotes Female and + denotes male)

Since P is a male (denoted by '+' in the figure) S must be a female (Since no two females work in the same department or on the same floor).

If S is female, M must be male (since they are in the same department).

Also, since N and S are in the same department, N is also a male. This gives us the final figures us:

M +	Q -	III
N +	T –	II
S -	P +	I

Also, S, M and N work in either Accounts or Administration. Q—Administration. At this stage we can answer the questions:

4. S, Q, T (a)

For 5. data is inadequate since we just know that Q works in Admin, but we do not know who else works in Admin (and whether someone works in Admin or not).

Hence (d).

For 6. Since Q is in Admin, S must be in accounts (as she cannot be in personnel). Thus, T is in Personnel.

Hence (c).

7. N, T (d)
8. Q needs to move to Personnel to have the three women in three different departments.

Questions 9 to 13

The following table will emerge out of the given clues:

Vehicle	Profession	Profession
Maruti	B(+)	Engineer
	G-	Teacher
Santro	A-	Teacher
	F-	Engineer
	D+	Doctor
Opel	C-	Doctor
	E+	Teacher

Since C and D are doctors and A is not an engineer, hence, A is a teacher.

Since A travels in a Santro, C will travel in an Opel. Also, A and F will be together. Given A and F are pair of sisters, both are females.

In a Maruti, only two persons B & G travel, so G is a female. Two persons belonging to the same profession do not travel in the same vehicle, so D travels in a Santro. There are two doctors, two engineers and three teachers and persons of the same profession do not travel in the same vehicle, so F is an engineer. And E is a male teacher.

The answers are:

9. (a)
10. (c)
11. (b)
12. (b)
13. (d)

Questions 14 to 19

The following table will emerge out of the given clues:

	Tennis	Badminton	Table tennis
A	×	.	.
B	×	.	.
C	×	.	.
D	.	×	.
E	.	×	.
F	.	×	.
G	.	.	×
H	.	.	×
I	.	.	×
J	×	×	
Total	N	N-1	

14. (b) Looking at the options, the only possible solution is option (b) (as Table Tennis should be an odd number of people as Tennis + Badminton is 2n–1)

15. (b) If Table Tennis players are 7 in number then,

    n + n – 1 = 3.

    2n = 4.

    n = 2. This is possible.

16. (d) Going through options we find that the only possibility is G and H as we would need 7 people to be Table Tennis players in such a case.

17. (c) If the Table-Tennis team has just one member J, then the Tennis team will surely have D, E and F as players.

18. (a) A,B and J would then be definitely Table Tennis players.

19. (c) If the Badminton team has 2 players, then the Tennis team will have 3 players The remaining players will be in the Table-Tennis team.

20. (c)

21. (c)

22. (b)

23. (d)

24. (b)

25. (c)

26. (d)

Questions 27 to 28

Refer to the clues given to us in the information, the best way to solve this question is to tabulate as well as comprehend the direct and indirect clues given to us. The first clue given to us is that L_1 difficulty projects will have single researchers and other difficulty level will have two researchers. Now it is given that ROC II and ROC III are L_2 and L_3 respectively. Thus, ROC I and ROC IV are L_1 level. Direct clues given to us point that Ex can be assigned only L_1 projects which are ROC I and ROC IV. Next set of clues given to us says that Ax cannot work with Bx, Cx, Dx and Fx. Thus, Ax will also be assigned to project requiring a single researcher hence either ROC I or ROC IV. Now since Fx cannot be assigned to L_3 level so he must have been assigned to ROC II and he can work with either Dx or Cx, but Fx will work with Dx since Bx cannot work with Dx. Now Bx will be assigned to the remaining L_3 project i.e. ROC III and Bx has the option of working with Cx.

	L_1	L_2	L_3	L_1
	ROC I	ROC II	ROC III	ROC IV
Ax	X/√	X	X	√/X
Bx	X	X	√	X
Cx	X	X	√	X
Dx	X	√	X	X
Ex	√/X	X	X	X/√

27. Hence Option (d) is the correct answer.
28. If Fx can neither work in ROC I and ROC II then we become uncertain about the projec assignment for each of Ax, Ex and Fx.
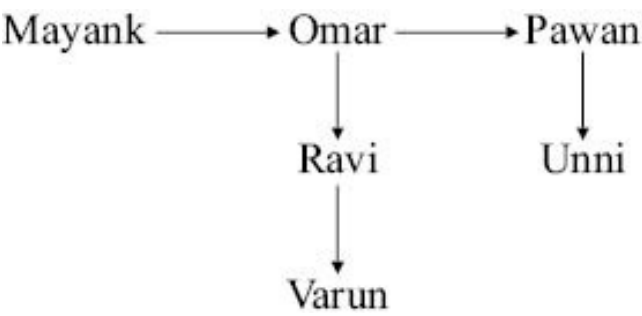
    Hence Option (c) is the correct answer.

Questions 29 and 30

For this question, let us form a tree since there are separate events related to going of Neha and Omar with Mayank . There will be two scenarios that we need to analyse which is graspable from the very first line of the information given, i.e., if Mayank goes to Singapore he takes with him either Neha or Omar.

i) If Neha goes then Pawan goes. Shawn will go with Neha only. Tanvi will go ifPawan goes and same condition goes for Varun who goes to Singapore if Shawn accompanies him.
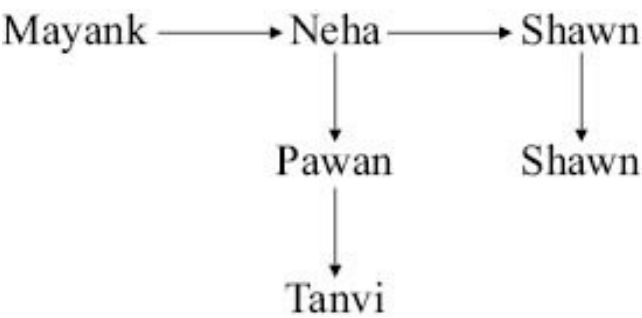
ii) If Omar goes then Ravi goes with him, and Pawan also will go with Omar. Varun will accompany Ravi and Unni will accompany Pawan.

29. Hence Option (b) is the correct answer.
30. Look at the trees, Varun goes due to either Neha and Omar who go with either Shawn or Ravi

    Hence Option (c) is the correct answer.

Questions 31 and 32

We have been given that Amir and Gaurav sit on benches Mahogany and Maple. Now since Fahim is a boy and sits with only Bikram, this implies that Bikram is a female. (This conclusion was made on the grounds that there is at least one girl on each bench). Fahim and Bikram sit on the Oak bench.

On the basis of above information we get:

Mahogany:	**Amir**	—
Oak:	**Fahim(boy)**	**Bikram(female)**
Maple:	**Gaurav**	—

Now since Charlie is a girl student and she does not sit with Amir, Emraan and David, it implies that Charlie sits on Maple bench because on Oak bench only two persons can be seated. By elimination of clues, Emraan and David sit on Mahogany bench. Now see the clue, "Amir sits with his friend" this means that Amir is male. Again Emraan is the brother of Charlie implies that Emraan is a male. By elimination David is a female. But sex of Gaurav is still unknown.

Thus the information obtained above can be summarised as follows:

Mahogany: **Amir(boy)**   **David(female)**   **Emraan(boy)**
Oak: **Fahim(boy)**   **Bikram(female)**
Maple: **Gaurav**   **Charlie(female)**

31. David, Bikram and Charlie are girls. Possibility of fourth girl still exists because sex of Gaurav is unknown. Hence Option (c) is the correct answer.
32. Option (d) is the correct answer.

Questions 33 to 35

If there are at least two passengers in each vehicle and one of them is a male then, in the group there are at least three males. Among them Niharika is a female and she is a doctor. Geetika and Aishwarya are also females. From the second clue we get Aparajita is a teacher. Deep is a male and he is an engineer. He travels with only Aparajita, which means Aparajita is a female. And both of them travel in Maruti. From the third clue Shwetabh is a male and he is a doctor. From fifth clue Geetika is not an engineer and she cannot be a doctor because there can be only two doctors (Niharika and Shwetabh). Hence, Geetika is a teacher and she travels in Santro. So there are four females Niharika, Geetika, Aishwarya and Aparajita. Hence the remaining persons will be male because in each vehicle there has to be at least one male. Hence Akansha is a male and Shwetabh and Akansha will occupy seats in two different cars (Santro and Octavia) because in Maruti, Deep travels only with Aparajita. Again Niharika can travel neither with Shwetabh nor with Geetika and Aishwarya. Thus we have the final arrangement as follows:

Person	Profession	Vehicle	Sex
Deep	Engineer	Maruti	M
Aparajita	Teacher	Maruti	F
Geetika	Teacher	Santro	F
Shwetabh	Doctor	Santro	M
Aishwarya	Engineer	Santro	F
Akansha	Teacher	Octavia	M
Niharika	Doctor	Octavia	F

Now we can answer the questions as follows:

33. Option (a) is the correct answer.
34. Option (c) is the correct answer.
35. Option (b) is the correct answer.

Questions 36 and 37

From the clues given we can directly arrange the persons according to their heights.

I>K>H>N>L>J>M>G

Now let us arrange the persons to their games that they play.

Persons	Cricket	Badminton	Hockey
G	X	X	√
H	√	X	X
I	√	X	X
J	X	√	X
K	X	X	√
L	√	X	X
M	X	√	X
N	X	√	X

Now we can answer the questions.

36. Option (d) is the correct answer.
37. Option (b) is the correct answer.

Questions 38 and 39

Let us decode the clues to clear the picture and sequence all the events that are given in the information. We have been given that Bali and Giri are in Marketing, Fateh in Finance and Dabang is not in HR. This means that Dabang is in Finance. By the process of elimination, remaining Chinkara, Jeev and Himesh are in HR.

Discipline	Students
Marketing	Bali and Giri
Finance	Fateh and Dabang
HR	Chinkara, Jeev and Himesh

Now to arrange students with their respective colleges is the next task. We have been given Dabang who is a male student studies in IIM R only with Bali. This means that in IIM R only two students study and Bali is a female since at least one boy and one girl study in a college. Now we have been given Fateh who is a male student studies in IIM B but not with either Jeev or Chinkara. This means that Jeev and Chinkara study at IIM A. Also we have been given that Bali's sister Giri and Himesh who is a female, study in the same college. This college cannot be IIM A because then there will be only a single student in IIM B. Hence Himesh and Giri study at IIM B. Still we do not know about the sex of Jeev and Chinkara.

College	Students
IIM A	Jeev and Chinkara
IIM B	Fateh (Male), Himesh (Female) and Giri (Female)
IIM R	Dabang (Male) and B (Female)

Now we can answer the questions.

38. The students who study HR are Chinkara, Jeev and Himesh.Among the three Chinkara and

Jeev study at IIM A. Hence Option (d) is the correct answer.

39. If Chinkara and Bali interchange their colleges satisfying all other conditions it implies that Chinkara is a female and Jeev is a male. Thus the group consists of Chinkara, Bali, Giri and Himesh. Hence Option (b) is the correct answer.

Questions 40–41

This question is a classic example of primary and secondary clues being provided in the information. To solve this set one must be able to analyse all the possibilities given in the clues to derive conclusive data arranged in an appropriate manner according to the given conditions.

Let us solve the problem. From clue one we get that the two persons who visit on Friday are Pepe and the person who visits with Pepe is a Defence specialist. Now from clue three Fefe is a Biotech specialist and he visits alone on Tuesday. Also from clue seven we get that the specialist in Genetics visits on Friday. This means that Pepe is a Specialist in genetics.

Moving onto clues four and five we get that Meme and Keke visit on Wednesday and from clue six the engineer visits with Paramedics . Thus they visit either on a Wednesday or on a Saturday. Again, from clue two the engineer does not visit on Saturday. Thus, engineer and paramedics visit on Wednesday. Now using clue four we get that Meme is Paramedics and Keke is the engineer. Again from clue five we get that Hehe is not a defence specialist and Hehe does not visit on Friday. Hence Hehe visits on Saturdays. Similarly from clue eight we get that Bebe also visits on Saturday.

The only person left to analyse is Dede who is the specialist in defence. Also since Bebe is not a businessman, Hehe is a businessman and Bebe is a specialist in Biometrics.

Now we can summarise our analysis in a table:

Tuesday	Fefe (Biotech)
Wednesday	Meme (Paramedic), Keke (Engineer)
Friday	Pepe (Genetics), Dede (Defence)
Saturday	Hehe (Business), Bebe (Biometrics)

Now we can answer the questions:

40. Option (a) is the correct answer.
41. Option (d) is the correct answer.
42. To solve the question lets look into the clues given and try to pair assistants with bosses and respective countries. For this, one must start reacting to the clue that gives a clear picture of the relationship such as the clue of Davis and Catty working together. China operations would not be headed by a person whose name ends in 's'. Let us tabulate the information in the clues and draw a clear picture of the scenario.

	Alexis	Benny	Carena	Davis
	Arnold	Dave	Billy	Catty
Afghanistan	√	X	X	X
Pakistan	X	X	√	X

| Japan | X | X | X | √ |
| China | X | √ | X | X |

42. Hence Option (b) is the correct answer.