# 14 Analytical Reasoning

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# WHAT ARE THE QUESTIONS?

Analytical Reasoning questions always appear in groups of four to seven questions, all based on an initial set of conditions, or rules, the entire set of questions, including its rules, is what we will call a single Analytical Reasoning problem.

**Tip:**

To succeed on the Analytical Reasoning questions, draw a rough diagram. An accurate diagram can help you simplify an Analytical Reasoning problem so much that you merely have to glance at the diagram to answer some questions.

## Introduction to the Problem

Each problem begins with a few introductory sentences describing a particular situation. The introduction will suggest what you are being asked to do with the particular problem.

The introduction will tell you how many people or things you are going to be working within the problem. Typically, you will be asked to manipulate between five and eight people or things-sometimes more, sometimes less.

## Conditions or Rules

The introduction is followed by several short statements, called "rules," which set certain conditions that must be followed. These rules tell you what you can and cannot do with the people or things that you are moving around for the problem. The rules that you are given at the beginning of Analytical Reasoning problem must be followed for all of the questions that are part of that problem.

## Additional Information

Very often, the individual questions may add additional conditions of their own. If a question adds a new condition, that new condition applies to that question only; but the initial rules apply to the entire set of questions.

### Example

A sample Analytical Reasoning problem begins with an introduction and rules that look like this:

Six people-Javed, Kamran, Khan, Maryem, Naved, and Osama were born during the years 1960 through 1965, inclusive. No two people were born in anyone year.

Javed was born before Kamran but after Khan. Kamran was born in 1963.

Naved and Maryem are younger than Osama.

In this sample, the introduction tells you that you are going to be working with six people and that you will be arranging them in order according to their ages. The people's names are supplied for you, but their names are unimportant except as a way of identifying them.

## Conclusions and Deductions

You are asked to make deductions or conclusions from a set of statements, conditions, or rules that describe the relationships among given entities such as persons, places, things, or events.

They simulate the kinds of detailed analyses of relationships that a student must perform in solving research oriented problems they will have to interact during higher studies.

For example, seven airplane passengers sitting in Business class, follow certain rules as to who can sit where. You must answer questions about the deductions from the given information, like,

Who is sitting with passenger A?

No formal training in logic is required to answer these questions correctly. Analytical reasoning questions are intended to be answered using knowledge, skills, and reasoning ability generally expected of college/ university students and graduates.

## TYPES OF CONDITIONS

Three basic types of conditions frequently appear on the GAT. If you carefully write out the condition on the scratch sheet, you'll be more fluent to link the conditions drawing logical conclusions.

### Isolated Conditions

Any condition that fixes a rule to single entity and does not depend upon any other entity of the problem is an isolated condition.

e.g., R stays at Peerowaal and I at Multan.

Such relations are easily manageable by fixing the entities in the diagram of the question.

### Linked Conditions

Some rules of the questions link two or more than two entities. The test taker is actually, asked to adjust the entities correctly for the right answer.

e.g., R and I always sit next to each other.

The questions base on the adjustment of such type of links.

### Implied Link Conditions

Some relationships that are not stated in the conditions are implied by and can be deduced from the stated set.

e.g., If one condition about boxes on a shelf specifies that Box 1 is to the left of Box 2, and another specifies that Box 4 is to the left of Box 1, then it can be deduced that Box 2 is to the left of Box 4.

## TYPES OF QUESTIONS

### Ranking:

Ranking problems are the kinds of problems in which you are asked to place people or objects in order according to some kind of ranking. Some of them might be:

Grades assigned in an exam

Age

Height

Weight

Seating Arrangement

Finishing order in a race

or any other kind of situation in which you can organize the people or objects you are given. In a typical ranking problem, you will have one space or fixed value for each person or object you are ranking. In the preceding example regarding the ages of the six individuals, you had exactly one year for each of the six individuals. You cannot assign two years as year of birth for a person.

## Distributing

Distribution problems are similar to ranking problems, but you will not always have a simple linear arrangement for ordering the people or objects in the problem.

| |
|---|
| Placing cars in a multi-level parking garage, where there can be one, two, three, or more cars on any particular floor of the garage |
| Arranging businesses into office spaces in a building, where more than one business can occupy any particular floor |
| Placing people in seats in a theater, where people do not necessarily appear in the same row. |

A successful diagram for a distribution problem, instead of containing a single line across, as in. the ranking problem, will often have several rows and several columns, to represent the various spaces available for distribution.

## Scheduling

A Scheduling problem usually requires you to arrange a schedule of some event. You might be organizing a schedule of:

| |
|---|
| performers in a recital |
| children visiting the doctor |
| television shows during nights of the week |

The roles will differ somewhat from the kinds of roles you will have in Ranking or Distributing problems, but the basic task is still the same: arrange the people or objects in the order allowed by the roles.

A sample-scheduling problem looks like this:

Shahid is starting a new business mowing lawns for people in Navy town at Karachi. He has seven customers: A, B, C, D, E, *F,* and G. He must arrange his schedule so that he can mow everyone's lawn once a week. He must plan his schedule as follows:

Shahid can only mow lawns from Monday to Friday, and he can do no more than two each day, one in the morning and one in the afternoon.

A's lawn is so large that it takes an entire day.

Because B and D live on opposite sides of town, Shahid cannot schedule them together on the same day.

Shahid must mow F's lawn on Friday afternoon.

Shahid can mow G's lawn only in the afternoon, but on any day.

The diagram for this kind of scheduling problem would look something like this:

| | Mon | Tue | Wed | Thu | Fri |
|---|---|---|---|---|---|
| Morning | not e | not e | not C | not B | not A |
| Afternoon | 2 | F | S | 1 | F |

G any day  A any whole day  B D must be separate day

## Networks

This type of problems begins by giving you a series of links between people, places, or objects. Typically, you will be connecting:

| |
|---|
| towns by a series of roads |
| islands by a series of bridges |
| people in offices by the series of jobs they must perform |

Your diagram will be a network of arrows showing the links from one person or abject to the next. To succeed on this type of problem, you must pay very careful attention to a long list of very specific details. Once your diagram is complete for a Network problem, the questions are usually very simple.

**Example**

A medical complex has ten different buildings, connected by a series of underground tunnels. The tunnels connect the buildings as follows:

Building 1 is connected directly to buildings 2 and 3.

Building 2 is connected directly to buildings 3 and 4.

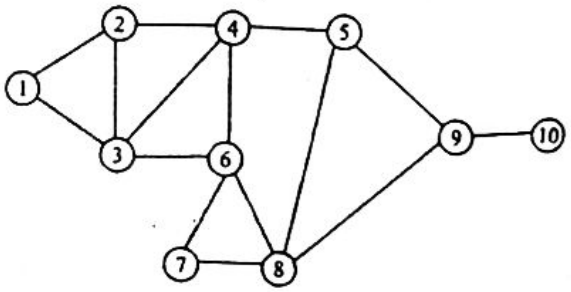
Building 4 is connected directly to buildings 3, 5, and 6.

Building 6 is connected directly to buildings 3, 7, and 8.

Building 7 is connected directly to building 8.

Building 8 is connected directly to buildings 5 and 9.

Building 9 is connected directly to buildings 5 and 10.




When completed, your diagram will look something like this:

## Topologies or Maps

These problems usually require you to arrange certain people or places in a geographic arrangement, usually around some central location. Typical problems will ask you to arrange:

trees around a fountain

schools around a central location

cities around a provincial capital

You will be given information helping you to place some of the items in relation to the central point.

## General Types of Questions

The passage used for each group of questions on the test generally, describes a common relationship such as the following:

## Tasks and Performance

Two sales persons K and M, visit their territories $T_1$ and $T_2$ in four days, Monday through Thursday.

## Grouping

A commander forms a troop from four soldiers – A, B, C, and D. Each soldier has a particular strength.

## Sequencing

Bus-2 arrives after Bus-3 but before Bus-1.

## Topologies

A city has four towns and each town is connected to at least one other town by roads, some of which are connected by intercity railway track.

Careful reading and analysis are necessary to determine the exact nature of the relationships involved.

**Study Options Systematically**

Some conditions will require you to consider two or more possible "solutions" to the question. This requires you to consider all of the possible option that makes the most sense. You use your scrap paper to list the possibilities one by one, using abbreviations to jot them down quickly and succinctly.

# STRATEGY

Here are the basic things that you need to succeed on Analytical Reasoning questions. These problems require great attention to many minute details.

The best way to achieve success on this part of the test is to try to diagram the information that you are given before you try to answer any of the questions. Then, with your diagram in front of you, attack the questions. Some of them will be answered very easily just by glancing at the diagram.

Always be careful not to assume anything that you have not explicitly been told about a particular problem.

Some of the questions will require some extra work, using additional information provided. In either case, you must always be aware of the information that you have to work with, and of the information that you do NOT have.

## Work in Sequence

Some people prefer to answer first those questions about a passage that seem less difficult and then those that seem more difficult.

It is not good to start another passage before finishing one begun earlier, because it is time consuming to return to a passage and to re-establish familiarity with its relationships.

## Avoid Wrong Judgment

Do not assume that because the conditions for a set of questions look long or complicated, the questions based on those conditions will necessarily be difficult. Avoid the wrong judgment, work in sequence, and try all questions.

## Avoid your own Assumptions

Do not introduce unwarranted assumptions in the given conditions. Always rely on the given conditions and facts only. For example, don't assume that if A is taller than B then A has more weight than that of B.

**Modify the diagram as you need**

Each problem begins with a series of statements describing the conditions that develop the relationships. These conditions will be the basis for your initial diagram. However, some of the questions may add new information.

## Exploit Given Information

Each passage provides full information required to solve the question. The conditions are designed to be as clear as possible; do not interpret them as if they were intended to trick you. For example, if a question asks how many women could be eligible to get admission, consider only those women named in the passage unless directed otherwise.

When you feel doubt, read the conditions in their most obvious sense. Remember, however, that the language in the conditions is intended to be read for precise meaning.

**Assume nothing that isn't stated**

The conditions of a problem are written to be complete and all-inclusive; everything you need to know is stated explicitly or clearly inferable, and nothing that is not stated exclusively is to be assumed.

## Key Words

It is essential to pay special attention to words that describe or limit relationships, such as "only,""similarly""as'" "exactly," "never," "always," "must be," "can be", "cannot be," and the like.

## Treat every Question Independently

Test taker must treat each question separately from the other questions in its set; no information, except what is given in the original conditions, should be carried over from one question to another.

## Draw diagrams of the conditions

It is very useful to draw a diagram to assist you in finding the solution. On the other hand, many people find it useful to underline key points in the passage and in each question. In addition, some people like to use symbols, for example; the condition that A and B sit together can be represented by A<>B, and for "A and B are not to sit together" the symbol might be A<!>B. Visualization of conditions by symbol is a quicker reference in the application of the conditions than to read conditions repeatedly. You can devise your own symbols for most often used conditions. Always use a fixed symbol for a particular condition.

## Attacking With Diagrams

In preparing for the test, you may use different types of diagrams for different types of questions. There is by no means universal agreement on which kind of diagram is best for which problem or in which cases a diagram is most useful.

Do not be concerned if a particular problem in the test seems to be best approached without the use of a diagram.

## Scheduling Question

In scheduling problems, a tabular diagram may be helpful.

## Topological Question

For a topological relationship problems, an arrow diagram or a simple map can be a useful device.

**Example**

Country Kabana has seven major cities —A, B, C, D, E, F, and G. Three flights labeled 1, 2, and 3 are available to connect the cities following the rules:

Flight 1 has its ends at A and C, and passes through B only.

Flight 2 has its ends at B and C, and passes through D only.

Flight 3 has its ends at E and G, and passes through F only.

Directly connected cities are those cities, between which there is no other city to land any flight.

**Question:**

7. Which one of the following city is directly connected to the most other cities?

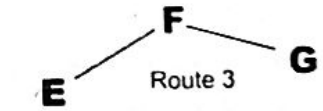
**A.** B

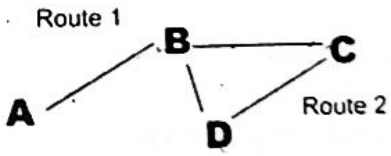
**B.** C

**C.** D

**D.** E

**E.** F




**Explanation:**

**Question Type**: Main Idea

**The best response is A.**

This question can be solved with the aid of Topological diagram.

Diagram clearly shows that city B is directly connected with most other cities.

## WARM UP EXERCISE

**Directions:** Each question or group of questions is based on a passage or a set of conditions. In answering some of the questions, it may be useful to draw a rough diagram. For each question, select the best answer choice given.

The answers and explanations of the questions have been given at the bottom of each question.

### For Question 1 – 3

A, B, C and D are all different people

I. A is the daughter of B

II. B is the son of C

III. C is the father of D

1. Which of the following is true?

   A. C is the uncle of A

   B. D and B are brothers

   C. A is the daughter of D

   D. If T is the daughter of B, then A and T are sisters.

   E. If P is the granddaughter of C, then P and A are sisters

### Explanation:

### The best response is D.

Choice A is incorrect because C is the grandfather of A. Choice b is incorrect because it is possible that D is a female. Choice C is incorrect because D (for example) may be a male and certainly could then have not mated with B. Choice E is incorrect for the following reason: if P is the granddaughter of C, she can be the daughter of D who may not have mated with B. Thus, P and A may be cousins, not sisters. Choice D is correct for the following reason: if T is the daughter of B, A and T are sisters since A is also the daughter of B

2. Which of the following is inconsistent with the stimulus material (three statements) above?

   A. D is the father of A

   B. C has three children

   C. A has one brother

   D. A is the granddaughter of C

   E. another party , P, could be the mother of A

### Explanation:

### The best response is A.

Choices B and C are incorrect because these choices are not inconsistent with the given statements. Choice D is a true statement. Choice E is incorrect for this reason: Since B is the father of A, another party P could, indeed, be the mother of A. Choice A is correct. Since B is the father of A, D cannot also be the father of A.

3. If T is the son of B and T has one brother, M , then

   I. A is the sister of M

   II. M and B are brothers

   III. C is the grandfather of M

   A. I only

   B. II only

   C. III only

   D. I and III only

   E. I and II only

**Explanation:**

**The best response is D.**

If T is the son of B, then T is a brother of A. If T has one brother, M, then A is the sister of M. Thus statement I is correct. M and B cannot be brothers because B is the father of M. Thus statement II is incorrect. C is the father of B, so C is the grandfather of M. Thus statement III is correct.

**For Question 4 - 8**

The following statements describe the relative rank of employees in National Refinery Limited:

I. A is the immediate superior of B

II. C is a superior of D

III. B works under E

IV. F is superior to C

4. Which of the following statements is necessarily true?

A. A is a superior of D

B. B is a superior of F

C. F is a superior of D

D. E is superior of D

E. C works under A

**Explanation:**

**The best response is C.**

Choice A is incorrect because we cannot deduce the relationship between A and D. similarly, Choice B is incorrect because we cannot deduce the relationship between B and F. Likewise, Choices D and E are incorrect. Choice C is correct (see above)

5. Which of the following statements cannot be true?

A. B is a superior of C

B. A is superior of F

C. E is a superior of F

D. A is a superior of E

E. C and A have the same power in the organization

**Explanation:**

**The best response is D.**

Choices A, B, C and E are incorrect answers because we cannot deduce a relationship between the pairs in each choice. Choice D is correct answer because of the following: A is the immediate superior of B; E is a superior of B. thus E must be superior to A.

6. If T is the immediate superior of A then

A. E is superior to T

B. F is superior to T

C. B is superior to T

D. D is superior to T

E. T is superior to C

**Explanation:**

**The best response is A.**

If T is the immediate superior of A, then E must be superior to T

7. If C is superior to M, then

A. E is superior to D

B. E is superior to M

C. F is superior to M

D. B is superior to M

E. B is superior to A

**Explanation:**

**The best response is C.**

If C is superior to M, then, since F is superior to C, F must be superior to M

8. If B is superior to F, then

   I. B is superior to D

   II. A is superior to C

   III. E is superior to F

   A. I only

   B. II only

   C. III only

   D. I and II only

   E. I, II and III

**Explanation:**

**The best response is E.**

If B is superior to F, then the order of ranks is

E > A > B > F > C > D

Thus B is superior to D, A is superior to C, and E is superior to F.

**For Question 9 – 10**

There are four apartments that occupy one building block. Each apartment belongs to a different person who lives in the apartment and each person owns a car. The owners of the apartments are Ali, Haroon, Mustafa, and Afzal. The colors of the cars are black, orange, white, and maroon.

I. Afzal owns the black car

II. Haroon' apartment is not at either end of the block

III. Ali owns the second apartment from the left

Mustafa owns the white car

9. Which statement cannot possibly be true?

   A. Mustafa owns the end apartment on the right

   B. Mustafa owns the end apartment on the left

   C. Afzal owns the end apartment on the right

   D. Afzal owns the end apartment on the left

   E. One of the owners of the end apartment has a maroon car

**Explanation:**

**The best response is E.**

The table indicates that the end apartment owners have only white and black cars. Therefore, Choice E cannot possibly to true. Since the question asks which choice cannot possibly be true, Choice E is the correct choice. All the other choices may be true.

10. If Ali owns the orange car, which car can Haroon own?

    I. The maroon car

    II. The white car

    III. The black car

    A. I only

    B. II only

    C. III only

    D. I or III only

    E. I or II only

**Explanation:**

**The best response is A.**

The table shows that, if A owns the orange car, the B must own the maroon car. So Choice A is correct

## SOLVED EXERCISE

**Directions:** Each question or group of questions is based on a passage or a set of conditions. In answering some of the questions, it may be useful to draw a rough diagram. For each question, select the best answer choice given.

The answers and explanations of the questions have been given at the bottom of each question.

### Questions 1 - 6

Nine individuals - Z, Y, X, W, V, U, T, S and R are to serve on three committees labeled A, B and C.

- Each candidate should serve on exactly one of the committees.
- Committee A should consist of exactly one member more than that of committee B.
- It is possible that there are no members of committee C
- Among Z, Y and X none can serve on committee A.
- Among W, V. and U none can serve on committee C.
- Among T, S and R none can serve on committee C.

**Questions:**

1. In case T and Z are the individuals serving on committee B, how many of the nine individuals should serve on committee C?

A. 3
B. 4
C. 5
D. 6
E. 7

**Explanation:**

**The best response is B.**

If two persons serve in committee B, then three would work in A. This total 6 in A and B. The rest 4 of the persons would serve in C.

2. Of the nine individuals, the maximum number that can serve together on committee C is

A. 9
B. 8
C. 7
D. 6
E. 5

**Explanation:**

**The best response is D.**

If one works in committee B. now two persons have to work in A. the rest 6 will serve in C. moreover, the persons serving in committee A and B are R, S, and T because they cannot serve in committee C.

3. In case R is the only individual serving on committee B, which among the following should serve on committee A?

A. W and S
B. V and U
C. V and T
D. U and S
E. T and S

**Explanation**

**The best response is E.**

S and T cannot serve in committee C. therefore; these two will have to serve in committee A. Moreover, one person in B means two persons in A.

4. In case, any of the nine individuals serves on committee C, which among the following could not be the candidate to serve on committee A?

A. R

B. Y

C. W

D. T

E. S

**Explanation:**

**The best response is C.**

Now we are left with two condition i.e.

A cannot have X, Y and Z and B cannot have U, V and W

Therefore A can have U, V, W, R, S and T. the only available option is W which can serve on committee A.

5. In case T, S and X are the only individuals serving on committee B, the total membership of committee C should be:

A. Z and Y

B. Z and W

C. Y and V

D. Y and U

E. X and V

**Explanation:**

**The best response is A.**

If S, T and X are living in B, then four persons must b in A. Four persons serving in A would be R, U, B, and W. Y and Z cannot serve in committee. A as per conditions. Therefore only Y and Z are possible candidates to serve in C.

6. Among the following combinations which could constitute the membership of committee C?

A. Y and T

B. X and U

C. Y, X and W

D. W, V and U

E. Z, X, U and R

**Explanation:**

**The best response is B.**

| A | B | C |
|---|---|---|
| 2 | 1 | 6 |
| 3 | 2 | 4 |
| 4 | 3 | 2 |
| 5 | 4 | 0 |

From this, it becomes evident that even number of candidates would serve in C. and those would not include R, S and T. The only option that contains even number of candidates and the potion that do not include R, S and T is option B i.e. X and U.

## Questions 7 - 12

Four captains and the first mates of three of them were called to attend the annual meeting at head quarters. The captains were Luqman, Manzoor, Nauman, and Osaf; the first mates were Ayesha, Durya, and Gia. Each person in turn delivered a report to the chairperson as follows:

Each of the first mates delivered their report exactly after her captain. The first captain to speak was Manzoor, and captain Nauman spoke after him.

(Represent the person with first letter of his name)

## Questions:

7. Which of the following order of delivering report is not conformable with the conditions?

A. M, A, N, G, O, L, D

B. M, D, N, G, L, O, A

C. M, N, A, L, D, O, G

D. M, N, A, O, D, L, G

E. M, N, G, D, O, L, A

**Explanation:**

**The best response is E.**

From given conditions, two mates cannot be together. Moreover, two captains can present consecutively because one captain has no mate.

8. In case A is the third of the first mates to speak, and L is the captain whose first mate is not present, which among the following statements must be true?

A. A spoke sometime before L.

B. D spoke sometime before O.

C. L spoke sometime before O.

D. O spoke sometime before L.

E. O spoke sometime before N.

**Explanation:**

**The best response is B.**

Manzoor , Nauman , Luqman, Osaf, Ayesha

Manzoor , Nauman , Osaf, Ayesha, Luqman

At position 1 and 2 any of the two mates D and G can be accommodated. We can see that in both these situations D is going to speak before Osaf.

9. Among the following statements, which statement must be true?

A. In case the second speaker was a captain, the seventh speaker was a first mate.

B. In case the second speaker was a first mate, the seventh speaker was a captain.

C. In case the third speaker was a first mate, the seventh speaker was a captain.

D. In case the third speaker was a captain, the seventh speaker was a first mate.

E. In case the seventh speaker was a first mate, the first and third speakers were captains.

**Explanation:**

The best response is A.

If second speaker was captain, then the first captain is without mate. The sequence become

| C | C | M | C | M | C | M |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Hence, 7th speaker would be a first mate.

10. In case A spoke immediately after L and immediately before O, and O was not the last speaker, L spoke

A. second

B. third

C. fourth

D. fifth

E. sixth

**Explanation:**

**The best response is C.**

According to given conditions, L, A, and O speak consecutively. Now before L, M and N must also speak and at last one of M and N, has his mate. Therefore, M, N, and O one mate occupies first 3 positions and L would be at the 4th position.

11. In case L speaks after A, and A is the third of the first mates to speak, then among the following statements which would be untrue?

A. O spoke immediately after G

B. The order of the first four speakers was M, G, N, D

C. O's first mate was present

D. A was the fourth speaker after M

E. The captains spoke in the order M, N, O, L

**Explanation:**

**The best response is D.**

12. Among the following statements, which

would make M, D, N, G, L, O, A the only possible sequence of speakers?

A. D is M's first mate; G is N's first mate; A is O's first mate.

B. D is M's first mate; G is N's first mate; A was the second to speak after L.

C. The order of the first four speakers was M, D, N, G.

D. The order of the last three speakers was L, O, A.

E. The order in which the captains spoke was M, N, L, O.

## Explanation:

**The best response is B.**

If D is first mate of M and G is N's first mate and A is the second to speak after L, then

N D N G L O A.

## Questions: 13 - 15

On a factory control room, there are three ON-OFF switches on central control panel, labeled A, B, and C. They are changed from default setting to a required setting based on the following rules:

In case only switch A is ON in the default setting, then turn switch B ON.

In case switches A and B are the only switches ON in the default setting, then turn switch C ON. In case all the three switches are ON, in default setting, then turn the switch C OFF. For any other default setting, turn ON all switches that are OFF and turn OFF all switches, if any, that are ON.

## Questions:

13. In case, in default setting the switches A and B are ON and the switch C is OFF, then what could be the second setting?

A. A ON, B ON, C ON.

B. A ON, B OFF, C ON.

C. A ON, B OFF, C OFF.

D. A OFF, B ON, C OFF.

E. A OFF, B OFF, C ON.

## Explanation:

**The best response is A.**

According to the condition when A and B are ON and C is OFF in the default setting, then turn switch C on.

14. In case only switch B is ON in the default setting, what must be the second setting?

A. A ON, B ON, C ON.

B. A ON, B ON, C OFF.

C. A ON, B OFF, C ON.

D. A OFF, B OFF, C ON.

E. A OFF, B OFF, C OFF.

## Explanation:

**The best response is C.**

According to the condition, when B is ON in default setting, then turn ON all switches that are OFF and turn OFF all switches that are ON.

15. In case, all the three switches are ON in the second setting, which among the following could have been the default setting?

A. A ON, B ON, C ON.

B. A ON, B ON, C OFF.

C. A ON, B OFF, C ON.

D. A ON, B OFF, C OFF.

E. A OFF, B ON, C OFF

## Explanation:

**The best response is B.**

If all switches are ON in the second setting, then it means that A and B switches were ON and B was OFF in the default setting. This answer

comes from the condition that if A and B are ON, then C must also be turned ON.

## Questions: 16 - 18

The city council in a modernized country devises a new employment scheme for locales. Based on this scheme, both men and women are categorized to R and B. types. No person can do job in his own type. If a man gets job, he becomes a part of his employer's type but if a woman gets job she retain her own type. Children belong to the same type as their fathers. If a male is terminated, he resigned from the job or is retired; he reverts to the type of his birth. More than one job at a time is not permitted. If a man gets married, his type is converted to the type of his wife.

### Questions:

16. A B type female could have had
    - I A grandfather born R type
    - II A grandmother born R type
    - III Her mother born R type

A. I only
B. III only
C. I, II and III
D. I and II only

### Explanation:

**The best response is D.**

If grandfather born R type, he may changed to B type after getting job. Her father/ mother may be B or R type; therefore, she may be of B type.

17. A male born B type and employed now may have

A. An uncle in either group
B. A born B type daughter
C. A born B type son
D. A son doing job in R type
E. A daughter doing job in R type

### Explanation:

**The best response is A.**

A man born B type is converted to R type after job, hence his son / daughter is of R type. His son / daughter cannot do job in R type. However, his uncle may be of any type.

18. Which of the following is not conformable to the rules

A. A born B type male doing job in R type
B. Daughter of born B type retired male is doing job in B type
C. Son of born B type retired male is doing job in R type.
D. Son of on job born B type male is working job in B type
E. A born B type male whose wife is of R type is doing job in B type

### Explanation:

**The best response is B.**

Choice A, born B type male can do job in R type.

Choice C, After retirement the born B type male is reverted to type B therefore his son is of B type and can do job in type R.

Choice D, born B type can do job in R type and is converted to R type, so his son can do job in B type.

Choice E, After marriage with R type woman, born B type male becomes R type so he can do job in type B.

Choice B, born B type is reverted to type B after retirement so his daughter who is of B type cannot do job in B type

## Questions: 19 - 21

Khan Fast Foods serves lunch Tuesday through Sunday. The restaurant is closed on Monday.

Mutton karahi, chicken karahi, Korma, fish fried, and vegetable are served each week based on the following conditions:

- Chicken karahi is served on three days each week, but never on Friday.
- Korma is served on one day each week.
- Fish fried is served on three days each week, but never on consecutive days.
- Chicken karahi and mutton karahi are both served on Saturday and Sunday.
- Vegetable is served five days each week.
- No more than three different foods are served on any given day.

## Questions:

19. On which of the following pairs of days could the restaurant's menu of foods be identical?

A. Friday and Sunday
B. Tuesday and Wednesday
C. Saturday and Sunday
D. Wednesday and Friday
E. Thursday and Friday

## Explanation:

**The best response is D.**

Choice A, chicken karahi is served on Sunday but not on Friday.

Choices B and E, fish fried cannot be served on consecutive days.

Choice C, fish fried is served on either Saturday or Sunday, but not both also fish fried is served on either Saturday or Sunday, but not both.

20. Which of the following is a list of the days on which chicken karahi and Korma may both be served?

A. Tuesday, Thursday
B. Tuesday, Wednesday, Thursday
C. Monday, Tuesday, Wednesday
D. Tuesday, Wednesday, Thursday, Friday
E. Tuesday, Wednesday, Thursday, Saturday

## Explanation:

**The best response is B.**

Chicken karahi cannot be served on Friday, and Korma cannot be served on either Saturday or Sunday. However, both may be served on any of the other three days.

21. Which of the following is true if fish fried is served on Saturday?

A. mutton karahi and fish fried are both served on Sunday
B. mutton karahi and chicken karahi are both served on Tuesday
C. Korma and chicken karahi are both served on Thursday
D. vegetable and mutton karahi are both served on Saturday
E. Korma and mutton karahi are both served on Friday

## Explanation:

**The best response is E.**

If fish fried is served on Saturday, it must be served on Tuesday and Thursday as well (otherwise, fish fried would be served on at least two consecutive days), and vegetable must be served on Sunday rather than Saturday (otherwise, four foods would be served on Saturday). Given these conclusions, you can eliminate A, B, C, and D because in each one at least four foods would be served on the day specified by the answer choice. E could be true, however. Korma and mutton karahi can both be served on Friday, since vegetable is the only food item that must be served on that day.

## Questions: 22 - 24

A city wagon has exactly six stops on its route. The wagon first stops at stop one and then at stops two, three, four, five, and six respectively. After the wagon leaves stop six, the bus turns, returns to stop one, and repeats the cycle. The stops of the wagon are named as L, M, N, O, P, and Q.

P is the third stop. M is the sixth stop. The stop O is the stop immediately before Q. N is the stop immediately before L.

### Questions:

22. If N is the fourth stop, which among the following must be the stop immediately before P.

A. O
B. Q
C. N
D. L
E. M

### Explanation:

**The best response is B.**

Now, O Q and N L are together. If N L is placed at 4 and 5, then O Q must be placed at 1 and 2. Hence Q must be before P.

23. If L is the second stop, which among the following must be the stop immediately before M?

A. N
B. L
C. P
D. O
E. Q

### Explanation:

**The best response is E.**

If N L is placed at 1 and 2, then O Q must be at 4 and 5. Hence Q will be before M.

24. In case a passenger gets on the bus at O, rides past one of the stops, and gets off at P, which of the following must be true?

A. O is stop one.
B. Q is stop three.
C. P is stop four.
D. N is stop five.
E. L is stop six.

### Explanation:

**The best response is A.**

If O is stop 1, a passenger rides at stop 1, passes through Q and drops at P. hence stop O is 1.

## Questions 25 - 28

Six scientists A, B, C, D, E, and F are to present a paper each at a one-day conference. Three of them will present their papers in the morning session before the lunch break whereas the other three will be presented in the afternoon session. The presentations have to be scheduled in such a way that they comply with the following conditions:

B should present his paper immediately before C's presentation; their presentations cannot be separated by the lunch break. D must be either the first or the last scientist to present his paper.

### Questions:

25. In case C is to be the fifth scientist to present his paper, then B must be

A. First
B. Second
C. Third
D. Fourth
E. Sixth

**Explanation:**

**The best response is D.**

B and C should be in the sequence and cannot be separated by lunch break. B must present before C. C is presently at 5th position. So B presents at fourth position.

26. B could be placed for any of the following places in the order of presenters EXCEPT

A. First
B. Second
C. Third
D. Fourth
E. Fifth

**Explanation:**

**The best response is C.**

B cannot be placed at position 3 and 6, because in position 3, B would be separated by a lunch break from C and B cannot be placed last because C has to follow B. Therefore, in available options, we choose C.

27. If F is to present his paper immediately after D, C could be scheduled for which of the following places in the order of presenters?

A. First
B. Second
C. Third
D. Fourth
E. Fifth

**Explanation:**

**The best response is E.**

According to the conditions, D must be at either first or last. In question, it is mentioned that B and C should be followed by D. Therefore, B, C, and D should be at 4, 5, and 6. C lies at 5th position.

28. If F and E are the fifth and sixth presenters respectively then which of the following must be true?

A. A is first in the order of presenters.
B. A is third in the order of presenters.
C. A is fourth in the order of presenters.
D. B is first in the order of presenters.
E. C is fourth in the order of presenters.

**Explanation:**

**The best response is C.**

If F and E are at 5 and 6 positions, then D is at 1st position because he can be at position.1 or positiion.6. B and C must be together and cannot be separated by lunch break and therefore they are to be placed at 2 and 3.

D B C A F E

The only possible position for A is 4th.

## SWEET CANDIES

**Directions:** Each question or group of questions is based on a passage or a set of conditions. In answering some of the questions, it may be useful to draw a rough diagram. For each question, select the best answer choice given.

Answer of each question has been given at the bottom of exercise.

### Questions 1 - 5

*The office staff of a firm engaged in marketing of innovative gimmicks consists of three accountants--A, B, C and five secretaries-- D, E, F, G, H. The top management is planning to expand its market by opening a new setup in another city using two accountants and three secretaries of the present staff. To do so they plan to separate certain individuals who don't function well together. The following guidelines were established to set up the new office*

I Accountants A and C cannot work together happily as A is a chain smoker and C is allergic to smoking and should not be sent together to the new office as a team

II C and E function well alone but quarrel when work together so, they should be sent to the new office as a team

III D and G have not been on speaking terms and shouldn't go together

IV Since D and F have been competing for promotion they shouldn't be a team

**Questions**

1. A majority of directors favored A to work as an accountant in the new office which of the following cannot be a possible working unit.

A. ABDEH
B. ABDGH
C. ABEFH
D. ABEGH

2. If C and F are switched to the new office, how many combinations are possible

A. 1
B. 2
C. 3
D. 4

3. If C is switched to the new office, which of the following cannot move to the new office

A. B
B. D
C. F
D. G

4. Which of the following must switched to the new office

A. B
B. D
C. E
D. G

5. If D goes to the new office, which of the following is/are true

I C cannot go
II A cannot go
III H must also go

A. I only
B. I and II only
C. II only
D. I and III only

## Questions 6 - 8

*An island, five kilometers away in the sea is connected to the land by two ways, three hanging bridges A, B, and C and three water routes 1 ,2 and 3. The managing authority offers services to people for coming in and for going out by officially managed vehicles on both ways.*

*When it snows, morning service on B is delayed. When it rains or snows, service on A, route 2 and route 3 are delayed in both the morning and afternoon When temperature falls below 30 degrees Fahrenheit afternoon service is cancelled on either A or on the route 3, but not both. When the temperature rises over 90 degrees Fahrenheit, the afternoon service is cancelled in either on C or on the route 3 but not both. When the service on A is delayed or cancelled, service on the C, which connects A is delayed. When service on the route 3 is cancelled, service on B, which connects the route 3 is delayed.*

**Questions**

6. On February 10th, with the temperature at 15 degree Fahrenheit, it snows all day. On how many services be affected, including both morning and afternoon.

A. 2

B. 3

C. 4

D. 5

7. On August 15th with the temperature at 97 degrees Fahrenheit, it begins to rain at 1 PM. What is the minimum number of services will be affected?

A. 2

B. 3

C. 4

D. 5

E. 7

8. On which of the following occasions would maximum number of services be disrupted.

A. A snowy afternoon with the temperature at 45 degree Fahrenheit

B. A snowy morning with the temperature at 45 degree Fahrenheit

C. A rainy afternoon with the temperature at 45 degree Fahrenheit

D. A rainy afternoon with the temperature at 95 degree Fahrenheit

## Questions 9- 11

Three men (Tahir, Pervaiz, and Javed) and three women (Elena, Ayesha, and Kiran) are spending a few months at Abbottabad. They are to stay in a row of nine cottages, each one living in his or her own cottage. There are no others staying in the same row of houses.

I Ayesha, Tahir, and Javed do not want to stay in any cottage, which is at the end of the row.

II Elena and Ayesha are unwilling to stay besides any occupied cottage.

III Kiran is next to Pervaiz and Javed.

IV Between Ayesha and Javed's cottage there is just one vacant house.

V None of the girls occupies adjacent cottages.

VI The house occupied by Tahir is next to an end cottage.

## Questions

9. Which of the above statements can be derived from two other statements?

A. Statement 1

B. Statement 2

C. Statement 3

D. Statement 5

E. Statement 6

10. How many of them occupy cottages next to a vacant cottage?

A. 2

B. 3

C. 4

D. 5

E. 6

11. Which among these statement(s) are true?

I Ayesha is between Elena and Javed.

II At the most four persons can have occupied cottages on either side of them.

III Tahir stays besides Pervaiz.

A. I only

B. II only

C. I and III only

D. II and III only

E. I, II and III

## Questions 12 - 14

An Internal Services Manager at a large corporation has been assigned the task of

allotting offices to six of the staff members. The offices are titled A through F.

- Mrs. Ruby needs to use the telephone quite often throughout the day.
- Mr. Mujahid and Mr. Zahid need adjacent offices as they need to consult each other often while working
- Mrs. Fauzia is a senior employee and has to be allotted the office marked E, having the biggest window.
- Mr. Abid requires silence in the offices next to his
- Mr. Shahid, Mr. Mujahid, and Mr. Abid are all smokers. Mrs. Fauzia requires non-smoker neighbors.

Unless specifically stated all the employees maintain an atmosphere of silence during office hours.

### Questions

12. The ideal candidate to occupy the office farthest from Mr. Zahid would be

A. Mrs. Fauzia
B. Mr. Mujahid
C. Mr. Shahid
D. Mr. Abid
E. Mrs. Ruby

13. The three employees who are smokers should be seated in the offices.

A. A, B and D
B. B, C and F
C. A, B and E
D. A, B and C
E. A, B and F

14. The ideal office for Mr. Mujahid would be.

A. B
B. F
C. A
D. C
E. D

## Questions 14-19

Two or more tealeaves out of five varieties--Livana, Mathia, Novajana, Oxia, and Piask are used in making all branded blends by a marketer following the rules given below.

- A brand containing Livana should also contain Novajana twice that of Livana.
- A brand containing Mathia must also have equal quantity of Oxia.
- A single brand never contains Novajana as well as Oxia.
- Oxia and Piask should not be used together.
- A blend containing Piask should contain it in such a proportion that the total amount of Piask present should be greater than the total amount of the other tealeaves

15. Among the following which is an acceptable brand in accordance with the rules?

A. One part Livana, one part Piask
B. Two parts Mathia, two parts Livana
C. Three parts Novajana, three parts Livana
D. Four parts Oxia, four parts Mathia
E. Five parts Piask, five parts Mathia

16. Adding more amount of Novajana will make which of the following brands conformable with the conditions?

A. One part Livana, one part Novajana, five parts Piask
B. Two parts Mathia, two parts Novajana, two parts Piask
C. One part Mathia, one part Novajana, one part Piask
D. Two parts Mathia, one part Novajana, four

parts Piask

E. Two parts Novajana, one part Oxia, three parts Piask

17. Among the following, the addition of which combination would make a brand containing two parts Novajana and one part Piask conformable with the conditions.

A. One part Livana

B. One part Mathia

C. Two parts Novajana

D. One part Oxia

E. Two parts Piask

18. Among the following, which combination cannot be used together in an agreeable brand containing two or more types of tealeaves?

A. Livana and Mathia

B. Livana and Novajana

C. Livana and Piask

D. Mathia and Oxia

E. Piask and Novajana

19. Among the below mentioned brands, which can be made agreeable by the eliminating some or all of one type of tealeaves?

A. One part Livana, one part Mathia, one part Novajana, four parts Piask

B. One part Livana, two parts Novajana, one part Oxia, four parts Piask

C. One part Livana, one part Mathia, one part Oxia, one part Piask

D. Two parts Livana, two parts Novajana, one part Oxia, two parts Piask

E. Two parts Mathia, one part Novajana, two parts Oxia, three parts Piask

## Questions 20 - 22

I All A's are B's

II All A's are C's or D's

III All C's and D's are A's

IV All E's are D's

V All G's are F's

VI No F's are A's

20. If no P's are D's which of the following must be true

A. No P is an A

B. No P is an B

C. If any P is an B it is an A

D. If any P is an A it is a C

21. Which of the following can be logically deduced from the stated conditions

A. No F's are B's

B. No B's are F's

C. Some F's are B's

D. No G's are A's

22. Which of the following is inconsistent with one or more conditions

A. All B's are A's

B. All B's are F's

C. Some B's are both F's and A's

D. No F's are B's

## Questions 23 - 27

In a shopping mall, six steps lead from the first to the second floor. Four peoples A, B, C, and D are to go from first floor to the second floor following the rules given below.

No two people can be on the same step. A is two steps below C. B is a step next to D. Only one-step is vacant (No one standing on that step).

Denote the first step by step 1 and second step by step 2 etc.

23. If A is on the first step, Which of the following is true?

A. B is on the second step

B. C is on the fourth step.

C. E, could be on the third step

D. D is on higher step than C

24. If E was on the third step and B was on a higher step than E which step must be vacant

A. step 1

B. step 2

C. step 4

D. step 5

E. step 6

25. If B was on step 1, which step could A be on?

A. 2ande only

B. 3and5 only

C. 3and4 only

D. 4and5 only

E. 2and4 only

26. If there were two steps between the step that A was standing and the step that B was standing on, and A was on a higher step than D , A must be on step

A. 2

B. 3

C. 4

D. 5

E. 6

27. Which of the following is false

i B and D can be both on odd-numbered steps in one configuration

ii In a particular configuration A and C must either both an odd numbered steps or both an even-numbered steps

iii A person E can be on a step next to the vacant step

A. i only

B. ii only

C. iii only

D. both i and iii

## Questions 28 - 30

Sales manager Nasir Ali is trying to establish a sales team to cover the Lahore region. His team will consist of four members - two experienced and two new sales representatives. Saleem, Fawad, Hanif, and Karim are the experienced sales representatives. Javed, Taimoor, and Daud are new. Saleem and Fawad do not work together Taimoor and Saleem refuse to work together. Hanif and Daud cannot work together

28. If Saleem is to be a part of the team, the following must be the other members:

A. Javed, Taimoor, Daud

B. Javed, Daud, Karim

C. Taimoor, Hanif, Karim

D. Daud, Javed, Fawad

E. Javed, Daud, Hanif

29. If Saleem is not chosen as part of the sales team and Taimoor is, then which one of the following must be true?

A. Daud and Hanif are on the team

B. Karim and Javed are on the team

C. Hanif and Fawad are on the team

D. Javed or Daud is not on the team

E. Fawad or Karim is not on the team

30. Which one of the following must be true?

A. Fawad and Saleem always work together

B. Karim and Daud never work together

C. Karim and Fawad always work together

D. If Javed works, then Karim doesn't work

E. If Saleem works, then Daud works

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

## BRAIN BUSTERS

**Directions:** Each question or group of questions is based on a passage or a set of conditions. In answering some of the questions, it may be useful to draw a rough diagram. For each question, select the best answer choice given.

The answers and explanations of the questions have been given at the bottom of the exercise.

### Questions 1 - 7

Multan Institute of Higher Studies plans to show five educational films A, B, C, D, and E to a group of students. The film shows are planned in an order, which conforms to the following conditions:

- A must be shown earlier than C.
- B must be shown earlier than D.
- E should be the fifth film shown.

### Questions

1. In case, C is shown earlier than E, which among the following will hold true?

A. A is the second film shown.

B. B is the second film shown.

C. C is the third film shown.

D. D is the fourth film shown.

E. E is the fourth film shown.

2. In case, D is to be shown earlier than A, then for which of the following is exactly the one position from first through fifth in which it can be scheduled to be shown?

A. A

B. B

C. C

D. D

E. E

3. Which among the following is an acceptable order for showing the educational films?

A. A, C, B, D, E

B. A, C, D, E, B

C. B, D, C, A, E

D. B, D, E, A, C

E. E, B, C, A, D

4. Which among the following is a pair of films that CANNOT both be shown earlier than E?

A. A and B

B. A and D

C. B and C

D. B and D

E. C and D

5. In case D and E are shown as far apart

from each other as possible, which among the following would be true?

A. A is shown earlier than B
B. B is shown earlier than C
C. C is shown earlier than E
D. D is shown earlier than A
E. E is shown earlier than B

6. In case B, D and E are to be shown one after the other in the given order, the position from first to fifth in which A could possibly be shown is

A. first
B. second
C. third
D. fourth
E. fifth.

7. In case exactly one film is shown between A and C, and exactly one film is shown between B and D, which among the following will hold true?

A. B is the film shown between A and C.
B. C is the film shown between B and E.
C. E is the film shown between A and C.
D. D is the last film shown.
E. E is the first film shown.

## Questions 8 - 12

In a scout training institute, there are three categories strikers, defenders, and helpers. Eight scouts are selected from these categories for learning to follow two commands—"attack" and "revert." At least one scout is selected from one category. All female scouts in the group are defenders. The results of the first lesson are as follows:

- At least two of the scouts have learned to follow the "attack" command, but not the "revert" command.
- At least two of the scouts have learned to follow the "revert" command, but not the "attack" command.
- At least one of the scouts has learned to follow both commands.
- Among the eight scouts, only helpers have learned to follow the "revert" command.

### Questions

8. Which of the following statements CANNOT be true?

A. The group includes more females than males.
B. The group includes fewer helpers than strikers.
C. The group includes more strikers than defenders.
D. More of the scouts have learned to revert than to attack.
E. More of the scouts have learned to attack than to revert.

9. If each scout has learned to follow at least one of the two commands, all of the following must true EXCEPT:

A. All defenders have learned to attack.
B. All strikers have learned to attack.
C. All helpers have learned to revert.
D. No defender has learned to revert.
E. No striker has learned to revert.

10. If four of the scouts are male and four of the scouts are female, all of the following must be true EXCEPT:

A. One of the scouts is a striker.
B. Four of the scouts are defenders.

C. Three of the scouts are helpers.

D. Three of the scouts have learned to revert.

E. Four of the scouts have learned to attack.

**11.** If the group includes more strikers than helpers, the minimum number of male scouts among the group that have learned to attack is

A. 0

B. 1

C. 2

D. 3

E. 4

**12.** If each scout has learned to follow at least one of the two commands, and if two of the scouts have learned to attack but not revert, it could be true that:

A. two of the scouts are female.

B. all of the scouts are male.

C. only one male scout has learned to attack.

D. one female scout has learned to revert.

E. two of the scouts are defenders.

Questions 13 - 14

A home furniture dealer has seven luxury sofas in his showroom: a Z, a Y, a X, a W, a V, a U and a T. The dealer must place the sofas in one of seven showroom spaces that are numbered 1-7 from left to right. Each showroom space must be filled with exactly one sofa. The following conditions apply to the placement of the sofas in the showroom:

1 X must not be placed in a space adjacent to W.

2 Z must be placed in a space adjacent to T.

3 Y must be placed in the first or the last space. If V is placed in the third space, then W must be placed in the fifth space

**13.** Which of the following is an acceptable placement of the sofas in the showroom spaces from one to seven?

A. Z, T, V, X, W, U, Y

B. Y, X, V, U, W, Z, T

C. X, Y, U, W, T, Z, V

D. Y, Z, V, U, W, T, X

E. U, X, V, T, Z, W, Y

## Explanation

The best response is B.

Choice A violates rule #1 (X and W cannot be in adjacent spaces).

Choice C violates rule #3 (Y must be in one of the end spaces).

Choice D violates rule #4 (if V is in space three, then W is in space five).

Choice E violates rule #2 (Z and T must be in adjacent spaces).

Thus, Choice B is an acceptable arrangement of the sofas on the showroom floor.

**14.** If W is placed in space seven, then which of the following must be FALSE?

A. Y is in space one

B. Z is in space two

C. X is in space three

D. V is in space three

E. T is in space two

## Questions 15 - 20

In a city, police commissioner planed to educate the citizens the traffic rules. He arranged a separate department and appointed senior staff members as instructors. Students in this class are required to meet the chief instructor once

per term. The chief instructor offers meeting times on one day, one meeting time in the morning, one in the afternoon, and one in the evening. The students in the class this term are Farid, Gia, Hamid, Javed, Kamran, Lubna, Majeed, and Nargis. The meetings with the chief instructor must conform to the following conditions:

- The chief instructor will not meet with only one student at a time.
- The chief instructor must meet with at least one student in each of the available meeting times.
- Farid and Javed cannot attend the same meeting.
- Kamran and Majeed cannot attend the same meeting.
- If Gia attends the morning meeting, then Kamran must attend the evening meeting.
- If Javed attends the afternoon meeting, then Hamid must attend the afternoon meeting.
- The number of students who meet in the morning must be the same as the number of students who meet in the evening.

## Questions 15 - 19

15. Which of the following is an acceptable arrangement of student meetings?

A. Morning: Farid, Gia, Nargis;
Afternoon: Hamid, Javed;
Evening: Kamran, Lubna, Majeed

B. Morning: Javed;
Afternoon: Farid, Gia, Hamid, Lubna, Majeed, Nargis;
Evening: Kamran

C. Morning: Gia, Majeed;
Afternoon: Hamid, Javed, Lubna, Nargis;
Evening: Farid, Kamran

D. Morning: Hamid, Lubna, Nargis;
Afternoon: Farid, Gia, Kamran;
Evening: Javed, Majeed

E. Morning: Farid, Gia, Hamid;
Afternoon: Javed, Majeed;
Evening: Kamran, Lubna, Nargis

16. If Javed and Kamran meet in the afternoon, which of the following must be true?

A. Farid attends the morning meeting.
B. Majeed attends the afternoon meeting.
C. Lubna attends the afternoon meeting.
D. Exactly three people attend the morning meeting.
E. Exactly four people attend the afternoon meeting.

17. If Gia meets in the morning and Lubna and Nargis meet in the evening, then how many different possible meetings could there be in the afternoon?

A. 2
B. 3
C. 4
D. 5
E. 6

18. If Hamid and Farid both meet in the morning, then which of the following must be true?

A. Javed meets in the evening.
B. Kamran meets in the morning
C. Lubna meets in the morning.
D. Majeed meets in the afternoon.
E. Nargis meets in the afternoon.

19. If Gia and Lubna are the only students who meet in the morning, then which of the following CANNOT be true?

A. Farid meets in the evening.
B. Hamid meets in the afternoon.
C. Javed meets in the afternoon.
D. Nargis meets in the evening.
E. Majeed meets in the afternoon.

## Question 21

A private nationwide chain of colleges has arranged a series of five promotional seminars. The board of directors selected five professors - Prof. Akmal, Bukhari, Chishti, Dilawar, and Ejaz to attend the seminars subject to the following constraints:

- If Prof. Akmal attends a seminar, then Prof. Dilawar does not attend it.
- If Prof. Bukhari attends a seminar, then either Prof. Chishti or Prof. Dilawar, but not both, attends it.
- If Prof. Chishti attends a seminar, then Prof. Ejaz does not attend it.
- If Prof. Ejaz attends a seminar, then either Prof. Akmal or Prof. Bukhari, but not both, attends it.

## Question

21. If Prof. Bukhari attends one of the seminars, then which one of the following could be a complete and accurate list of the other members of the college who also attend that seminar?

A. Prof. Akmal and Dilawar
B. Prof. Akmal and Ejaz
C. Profs. Chishti and Dilawar
D. Prof. Dilawar
E. Prof. Ejaz

## Question 22 -

Society for special education is to prepare seven blind students for national Naat competition in the month of Ramzan. Controller for academics of the society selects seven students —Tahir, Usman, Veena, Waseem, Ghias, Yasin, and Zafar. For this purpose, the students are to give a recital, and their instructor is deciding the order in which they will perform. Each student will perform exactly one Naat. In deciding the order of performance, the instructor must observe the following restrictions:

- Ghias cannot perform first or second.
- Waseem cannot perform until Ghias has performed.
- Neither Tahir nor Yasin can perform seventh.
- Either Yasin or Zafar must perform immediately after Waseem performs.
- Veena must perform either immediately after or immediately before Usman performs.

## Question:

22. If Veena performs first, which one of the following must be true?

A. Tahir performs sixth.
B. Ghias performs third.
C. Zafar performs seventh.
D. Tahir performs immediately after Yasin.
E. Waseem performs immediately after Ghias.

23. If Usman performs third, what is the latest position in which Yasin can perform?

A. First
B. Second
C. Fifth
D. Sixth
E. Seventh

## Questions 24 - 26

Five ladies, Ayesha, Bano, Chandni, Durya, and Elina enter in a series of baking contests in which they are to place their Biryani dish to the judges. The series follows the rules of presentation given below:

Bano places ahead of Chandni. Either Ayesha is first and Elina is last, or Elina is first and Ayesha is last. There are no ties in any contest. Everyone competes in each contest.

### Question

24. If exactly one lady places between Ayesha and Bano, which of the following must be true?

A. Ayesha wins first place.
B. Elina wins first place.
C. Durya places third.
D. Bano places fourth.
E. Chandni places fourth.

25. Which of the following CANNOT be true?

A. Chandni places second.
B. Durya places second.
C. Durya places third.
D. Chandni places ahead of Durya.
E. Durya places ahead of Bano.

26. Which of the following additional conditions makes it certain that Durya places second?

A. Ayesha places ahead of Bano.
B. Bano places ahead of Durya.
C. Durya places ahead of Bano.
D. Bano places behind Elina.
E. Elina places behind Durya.

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

# Explanations

| | | |
|---|---|---|
| 1. | D | According to condition A and C, make one pair of films, and B and D is the other pair. E is to be shown at the end. In case C is shown prior to E, two cases are possible.<br>A C B D E and B D A C E<br>In these scenarios, only option D is valid. |
| 2. | C | In case D is to be shown earlier then A, possibility is B D A C E<br>D can only be seen at 2nd position. |
| 3. | A | Option A is correct because it conforms to all the given conditions. |
| 4. | A | Film A and B can be shown only at position 1 and 3, while E is at 5. Therefore A and B cannot appear on 4th which can only be occupied by C or D. |
| 5. | C | The arrangement becomes B D A C E |
| 6. | B | If B, D and E are to be shown together, then<br>A C B D E<br>A could only be shown at 1 position. |
| 7. | A | The sequence becomes<br>A B C D E<br>Only option A is correct. |
| 8. | A | At least three scouts are helpers, all of which are male. At least one scout must be a striker, and all strikers are male. Thus, at least four scouts must be male, and so it is not possible for there to be more females than males among the group. Statement (A) must be false. |
| 9. | C | All scouts other than helpers must have learned to attack but not revert, because all scouts that have learned to revert are helpers. Thus, all defenders and all strikers have learned to attack but not revert, and statements (A), (B), (D), and (E) must all be true. However, it is possible for a helper to have learned to attack but not revert; thus, statement (C) is not necessarily true. |
| 10. | E | Since all females must be defenders, helpers and strikers must all be male. There must be at least one scout of each breed among the group, so one scout must be a striker, and three scouts must be helpers. (The remaining four scouts must be defenders.) Thus, statements (A), (B), and (C) must be true. If a scout has learned to revert, the scout must be a helper; thus, three scouts have learned to revert, and statement (D) must be true. Although at least three scouts have learned to attack, it is possible that as many as three scouts have learned neither to attack nor to revert. Thus, statement (E) is not necessarily true. |
| 11. | C | At least three scouts must be helpers. Since each breed of scout must be represented at least once among the group, one of the scouts must be a defender, and the remaining four scouts must be strikers. One of the three helpers (all of which are male) has learned to attack. All four strikers are male, and at least one the four strikers has learned to attack; otherwise, only three of the scouts at most could be strikers. Thus, a minimum of two male |

| | | |
|---|---|---|
| | | scouts must have learned to attack. |
| 12. | C | All scouts other than the two that have learned to attack but not revert must have learned to revert. All of those scouts (six in total) must be helpers and thus must be male (see general comments above). Since each breed must be represented among the group, of the two remaining scouts one must be a striker while the other must be a defender. Both the striker and the defender must have learned to attack but not revert. The striker must be male, although the defender could be either male or female. |
| 13. | B | Choice A violates rule #1 (X and W cannot be in adjacent spaces).<br>Choice C violates rule #3 (Y must be in one of the end spaces).<br>Choice D violates rule #4 (if V is in space three, then W is in space five).<br>Choice E violates rule #2 (Z and T must be in adjacent spaces).<br>Thus, Choice B is an acceptable arrangement of the sofas on the showroom floor. |
| 14. | D | W is in space seven (i.e. NOT in space five), then V cannot be in space three, and thus answer choice D must be false. |
| 15. | A | Choice A: violates rule (Kamran and Majeed cannot attend the same meeting)<br>Choice B: violates rule (the chief instructor will not meet with only one student at a time)<br>Choice D: violates rule (the number of students that meet in the morning must be the same as the number of students that meet in the evening)<br>Choice E: violates rule (if Javed meets in the afternoon, then Hamid meets in the afternoon).<br>Choice C: the only choice that does not violate the rules, so that is an acceptable arrangement of student meetings. |
| 16. | E | If Javed meets in the afternoon, then Hamid meets in the afternoon, so you have at least Hamid, Javed and Kamran in the afternoon.<br>H, J, K<br>Morning / Afternoon / Evening<br>The number of students who could be in each meeting (3,2,3 or 2,4,2), thus there are exactly four students in the afternoon meeting. |
| 17. | B | You have<br>G / L, N<br>Morning / Afternoon / Evening<br>If Gia meets in the morning, then Kamran meets in the evening.<br>G / K, L, N<br>Morning / Afternoon / Evening<br>Since there are three students in the evening meeting, you must have the 3,2,3 set up of students in the morning, afternoon and evening. Rule #3 says that Farid and Javed cannot attend the same meeting, so try putting Farid in the morning and Javed in the afternoon and vice versa to see how many possibilities there are. |

| | | |
|---|---|---|
| | | F, G \| J \| K, L, N<br>Morning \| Afternoon \| Evening<br>Now, since Javed meets in the afternoon, Hamid must meet in the afternoon, and the only remaining student, Majeed, must meet in the morning.<br>F, G , M \| H, J \| K, L, N<br>Morning \| Afternoon \| Evening<br>Thus, with Farid in the morning and Javed in the afternoon, there is only one possibility. If you try the other scenario, with Javed meeting in the morning and Farid meeting in the afternoon, then either Hamid or Majeed could meet in either the morning or the afternoon.<br>G, J , H/M \| F , H/M \| K, L, N<br>Morning \| Afternoon \| Evening<br>Thus, with Javed meeting in the afternoon and Farid meeting in the morning, there are two possibilities for the afternoon meeting, one with Farid and Hamid and one with Farid and Majeed. Accordingly, there are a total of three possible arrangements for the afternoon meeting if Gia meets in the morning and Lubna and Nargis meet in the evening, and B is the correct response. |
| **18.** | **A** | If Farid and Hamid both meet in the morning, then you have<br>F , H<br>Morning \| Afternoon \| Evening<br>Apply rule #6. if Javed meets in the afternoon, then Hamid meets in the afternoon, then if Hamid does not meet in the afternoon, then Javed does not meet in the afternoon. Further, rule #3 says that Farid and Javed cannot attend the same meeting, so that means that Javed cannot attend the morning meeting. If Javed cannot attend the morning meeting or the afternoon meeting, then he must attend the evening meeting, and A is the correct response. |
| **19.** | **D** | If Gia and Lubna are the ONLY students who meet in the morning; then by rule #3 you must have the 2,4,2 set up for the students in the morning, afternoon and evening meetings. Now, you have to split up Farid and Javed, and you have to split up Kamran and Majeed.<br>G, L \| F/J , K/M \| F/J, K/M<br>Morning \| Afternoon \| Evening<br>This shows you that you have to have either Farid or Javed, and either Kamran or Majeed in the evening, so since you have the 2,4,2 set up, that means that the evening meeting is complete and the remaining students, Hamid and Nargis, must meet in the afternoon.<br>G, L \| F/J , K/M , H , N \| F/J, K/M<br>Morning \| Afternoon \| Evening<br>Accordingly, it CANNOT be true that Nargis meets in the evening, answer choice D. |
| **20.** | **C** | The chief instructor is to meet with only one student at a time. However, the chief instructor still has to meet with at least one student during each meeting time, so he has to meet with at least one student in the morning and at least one student in the evening. Since there are eight total students, that leaves six students maximum that could meet in the afternoon. But |

will that violate any other rules? As long the one student who meets in the morning is a member of the restricted mutually exclusive pairs of Farid/Javed and Kamran/Majeed, and the same is true for the evening, then no other rules would be violated and the answer is C.

| F | G, H, J, K, L, N | M |
|---|---|---|
| Morning | Afternoon | Evening |

**21.** **D**

Choice A: along with Prof. Bukhari, Prof. Akmal, and Dilawar also attend the seminar. However, the first condition tells us "if Prof. Akmal attends a seminar, then Prof. Dilawar does not attend it." So, Profs. Bukhari, Akmal, and Dilawar cannot all attend the same seminar. Choice A, then, is incorrect.

Choice B: The fourth condition tells us what must be true if Prof. Ejaz attends a seminar, and then either Prof. Akmal or Prof. Bukhari, but not both, attends it. Since we know that Prof. Bukhari attends the seminar, we know that it cannot be true that both Prof. Akmal and Ejaz also attend that seminar.

Choice C: Since we know that Prof. Bukhari does attend the seminar, we also know that "either Prof. Chishti or Prof. Dilawar, but not both, attends it."

Choices D and E: No condition rules out Prof. Bukhari's and Prof. Dilawar's going to the same seminar—Choice (D)—and no condition forbids Prof. Ejaz's going with Prof. Bukhari to a seminar—Choice (E). However, recall that the question asks for what could be a "complete and accurate list" of the professors who attend the seminar with Prof. Bukhari. We know from the second condition that at least one other person must accompany Prof. Bukhari, and that among those who accompany Prof. Bukhari are either Prof. Chishti or else Prof. Dilawar. Since the conditions do not require anyone to accompany Prof. Dilawar, it is possible that Prof. Dilawar is the only person to accompany Prof. Bukhari. Thus, Choice (D) is an accurate Choice, in that it is possible that Profs. Bukhari and Dilawar attend the same seminar, and it is a complete Choice, in that Profs. Bukhari and Dilawar could be the only professors of the five to attend the seminar. So Choice (D) is correct.

Choice (E) is incorrect because we know that if Prof. Bukhari goes, someone other than Prof. Ejaz must also go. Choice (E) then is incomplete. It fails to list at least one professor whom we know must also accompany Prof. Bukhari.

**22.** **C**

Student Veena is shown in the first slot, as specified by the condition that "Veena performs first":

| | | | | | | |
|---|---|---|---|---|---|---|
| V | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

The condition that "Veena must perform either immediately after or immediately before Usman performs" tells us that Usman must occupy the second slot in the schedule.

| | | | | | | |
|---|---|---|---|---|---|---|
| V | U | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Choice A is incorrect because the statement that "Tahir performs sixth" is not necessarily true—we can place Tahir in one of the slots other than sixth and still meet all the conditions

of the problem. One such schedule, with Tahir performing third, is shown in the diagram below:

| V | U | T | X | W | Y | Z |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

We can develop this schedule as follows. With Veena, Usman, and Tahir in the first three positions, there are four positions left for Waseem, Ghias, Yasin, and Zafar.

Waseem must come after Ghias—because of the condition that "Waseem cannot perform until Ghias has performed"—so if we put Ghias fourth and Waseem fifth, this condition will be met.

This leaves two possible slots for Yasin and Zafar. Yasin cannot perform seventh because of the condition that "Neither Tahir nor Yasin can perform seventh," so we will place Yasin sixth and Zafar seventh.

Choice B is incorrect. In it, Ghias performs fourth, so it is not correct that the statement, "Ghias performs third," must be true.

Choice C, "Zafar performs seventh," is the credited response. We can show this by demonstrating that:

All the conditions can be met with Zafar in the seventh slot, and some of the conditions would be violated with Zafar in any slot other than seventh.

**23.** **D**

The correct response is D, because student Yasin can perform as late as sixth under the given constraint that "Usman performs third." The diagram below shows a recital order that meets all the given conditions and has Yasin performing in the sixth position.

| T | V | U | X | W | Y | Z |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

One strategy for arriving at this solution is to work backward to see which position is the latest in which we can place Yasin and at the same time produce a recital schedule that meets all the given conditions.

Using that approach, we immediately see that Yasin cannot perform as late as seventh, because of the condition that "Neither Tahir nor Yasin can perform seventh." Backing up and placing Yasin sixth, we can begin to fill in the schedule, as follows:

| | | U | | | Y | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

This schedule has five empty slots, into which we must fit performers Tahir, Veena, Waseem, Ghias, and Zafar. From our analysis of the previous question, we know that performers Tahir, Waseem, and Ghias cannot perform seventh, but that Zafar can, so we can tentatively place Zafar in the seventh slot.

We also know that "Either Yasin or Zafar must perform immediately after Waseem performs." If we place Waseem in the fifth slot, this condition will be met.

By placing Veena in the second slot, we can meet the condition that "Veena must perform

| | | |
|---|---|---|
| | | either immediately after or immediately before Usman performs."<br>We must place the remaining two performers, Tahir and Ghias, in the two remaining slots, the first and the fourth. Because the first condition states that "Ghias cannot perform first, " we<br>will place Ghias in the fourth slot and Tahir in the first. These positions will meet the conditions that apply to Tahir and Ghias: Tahir will avoid performing seventh and Ghias will perform before Waseem. Since Yasin can perform as late as sixth, response (D) is the correct solution. |
| 24. | E | If you marked (Ayesha), you failed to consider both possibilities. The possibilities are Ayesha, Durya, Bano, Chandni, Elina *or* Elina, Durya, Bano, Chandni, Ayesha (listed in order). In both cases one lady places between Ayesha and Bano. Only (Elina) must be true in both cases. |
| 25. | A | This is a very easy question. Chandni must follow Bano and Bano cannot be first (Ayesha or Elina is). Therefore, Chandni cannot finish second. |
| 26. | A | Try each answer choice using the diagram above. Only (Chandni) makes it certain that Durya places second. |