Four practice LSAT Logic Games with full explanations and diagrams

Instructions -- You can take all four practice games in a row, or do them individually. If you want to do the games under timed conditions, allow 35 minutes for all four (or just under 9 minutes for a single game.)

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Questions 1–6

Six students must participate in a committee—either the dance committee or the parade committee—to organize the homecoming weekend activities. Each of the six students—Quinton, Robert, Sutall, Tijkman, Valse, and Xi—will be on one of the committees. The participation of the students will be in accordance with the following conditions:

> If Quinton is on the parade committee, Tijkman is on the dance committee.
> Valse is on the parade committee if Tijkman is on the parade committee.
> Xi and Valse are always on different committees.
> Sutall in on the dance committee if Tijkman is on the dance committee.
> At least two students must participate in each committee.

1. Which one of the following could be a complete and accurate assignment of students to committees?

   (A) Dance: Sutall, Tijkman, Xi
       Parade: Quinton, Robert, Valse
   (B) Dance: Robert, Tijkman, Xi
       Parade: Quinton, Sutall, Valse
   (C) Dance: Sutall, Tijkman, Valse, Xi
       Parade: Quinton, Robert
   (D) Dance: Robert, Sutall, Xi
       Parade: Quinton, Tijkman, Valse
   (E) Dance: Quinton, Valse
       Parade: Robert, Sutall, Tijkman, Xi

2. Which one of the following CANNOT be a pair of students on the parade committee?

   (A) Quinton and Robert
   (B) Quinton and Sutall
   (C) Tijkman and Robert
   (D) Tijkman and Sutall
   (E) Robert and Xi

3. If there are exactly two students on the parade committee, then which one of the following must be true?

   (A) Tijkman is on the parade committee.
   (B) Sutall is on the dance committee.
   (C) Quinton is on the parade committee.
   (D) Robert and Xi are on the dance committee.
   (E) Tijkman and Sutall are on the dance committee.

4. Each of the following could be a complete list of the students on the parade committee EXCEPT:

   (A) Quinton, Robert, Valse
   (B) Sutall, Robert, Tijkman, Valse
   (C) Quinton, Valse
   (D) Tijkman, Valse
   (E) Quinton, Sutall, Valse

5. If Xi is on the parade committee, then which one of the following must be true?

   (A) Quinton is on the parade committee.
   (B) Robert is on the dance committee.
   (C) Tijkman is on the dance committee.
   (D) Valse is on the parade committee.
   (E) Sutall is on the parade committee.

6. If there are exactly two students on the dance committee, then which one of the following could be true?

   (A) Xi is on the parade committee.
   (B) Quinton is on the dance committee.
   (C) Tijkman is on the dance committee.
   (D) Quinton is on the parade committee.
   (E) Robert is on the dance committee.

Committee selection

Since all six members of the beginning group will be assigned to one of the two committees, this is a variation of the mono-group selection diagram. The rules are easy to diagram. (Figure 1) Rule 1 requires a one-way arrow from Q to T. Rule 2 requires an arrow from T to V. Rule 3 requires two arrows, one from V in the parade column to X in the dance column, and one from V in the dance column to X in the parade column. Rule 4 requires an arrow from T to S in the dance column. Now consider the occupancy limits. There must be at least two students on each committee, due to Rule 5. You can conclude that there are two members on the parade committee and four on dance, or three on parade and three dance, or four on parade and two on dance. Since V and X are mutually exclusive, reserve one space in each committee for them.

Dance   Parade
Q   Q
R   R
S   S
T   T
V   V
X   X

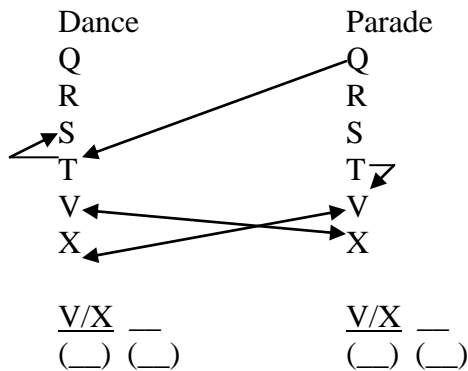V/X __   V/X __
(__) (__)   (__) (__)

Fig. 1

1. (A) – To make the most efficient use of your time, start with the first rule and work your way down the list of rules, eliminating answers as you go.
    (A) * This is a possible order. None of the rules were violated.
    (B) This violates Rule 4, because T is on dance and S is on parade.
    (C) This violates Rule 3, because X and V are not split up.
    (D) This violates Rule 1, because Q is on parade and T is on parade.
    (E) This violates Rule 2, because T is on parade and V is on dance.

2. (B) – Look at the parade column. You see that Q and T cannot both be on the parade committee. You also see that if T is on parade, then V must also be on parade, which would prevent X from being on parade. This should be sufficient analysis, go to the questions.
    (A) It is possible to put Q and R together on parade. When Q is on parade, T (and S) must be on dance. X and V must always be split between the two. R is the free agent. So it is QRV (or QRX) on parade and STX (or STV) on dance.
    (B) * It is not possible to put Q and S on the parade committee. When Q is on parade, T is on dance. When T is on dance, S is supposed to be on dance as well.

(C) It is possible to put T and R on parade. With T on parade, so must V. The other three could be on dance.

(D) With T (and S) on parade, so must V be on parade. The others can be on dance.

(E) R is a free agent, so it is unlikely R would run into any problems. When X is on parade, V must be on dance. Since V is on dance, T cannot be on parade, and so must be on dance. With T on dance, so must S. VTS is on dance. RXQ can be on parade.

3. (B) – This question uses a slightly different approach. It focuses on the occupancy instead of the individuals. Even so, the individuals will determine the result. It is best to form the possible two-person parade committees. Remember that V or X must always take one of the two spaces on parade. This simplifies things immensely. While doing the permutations, we learn that Q, R, or T can be the second member of parade. S cannot be the second member of parade, because this would push T into dance, and when T is on dance, S must also be on dance. (Figure 2)

(A) T may or may not be on parade.

(B) * Yes, S must be on dance, because of the effect of Rule 4.

(C) Q may or may not be on parade.

(D) R and X may or may not be on dance.

(E) Although S must be on dance, it is not necessary for T to also be on dance.

Parade		Dance			
Q	X/V	T	S	R	V/X
R	V/X	Q	T	S	V/X
T	V	Q	R	S	X

Fig. 2

4. (E) – Lacking new information, you need to work closely with the answer choices. Glancing at the parade column in the initial diagram, we see that Q and T cannot both be on parade. Keep that in mind. Although this question asks about the parade committee, make sure to consider the effect of each answer choice on the dance committee as well.

(A) If QRV is on parade, then TSX are on dance and no rules are violated.

(B) If SRTV is on parade, then QX are on dance and no rules are violated.

(C) If QV is on parade, SRTX are on dance and no rules are violated.

(D) If TV is on parade, QRSX are on dance and no rules are violated.

(E) * If QSV is on parade, RTX is on dance. This is invalid because when T is on dance, S is supposed to be on dance as well. So, this choice violates Rule 4.

5.	(C) – Consulting figure 1, when X is on parade, the first effect is that V is on dance. When V is on dance, T is no longer able to be on parade (Rule 2), so T is on dance. When T is on dance, S must also be on dance (Rule 4). So far, VTS is on dance. Can Q or R be with VTS? Yes, one of them can be with VTS. The other must be with X on parade, in order to meet the two-student minimum. Can both Q and R be with X? Yes, there is no reason they cannot both be with X.

(A) Q may or may not be on parade.
(B) R may or may not be on dance.
(C) * Correct. Because X is on parade, V must be on dance. Because V is on dance, T cannot be on parade, and so T must be on dance.
(D) V must be on dance, so this is 100% false.
(E) S can never be on parade, because T must be on dance.

6.	(B) – Again, the question focuses on the occupancy, but the analysis must focus on the members. Before doing permutations, you know that either V or X must take one of the two spaces on dance. Start your analysis there. (Figure 3) If V is on dance, then T must also be on dance, because of Rule 2. But then a problem crops up. Both spaces on dance are now taken, but S is supposed to be with T when T is on dance. So you now know that V is not on dance, V is on parade. If X on dance, the issue with T is the same, so T cannot be on dance because of S. Can Q be on parade with T? No, because of Rule 1. So Q must be on dance with X. This fills the two spaces, and you can stop the analysis now.

(A) X must be on dance, not parade.
(B) * Correct. Q must be on dance.
(C) T cannot be on dance.
(D) Q must be on dance, not parade.
(E) R must be on parade, not dance.

Parade 	Dance
~~X~~	~~V~~ ~~T~~
V T R S	X Q

Fig. 3

Questions 1–6

A veterinarian employed by the city zoo feeds the same animals every morning. The animals—falcons, gorillas, hyenas, iguanas, kangaroos, monkeys, and okapis—are fed one at a time and exactly once every morning. To ensure the animals are fed in an acceptable order, the following requirements must be satisfied:

    The gorillas are fed second or sixth.
    If the kangaroos are fed earlier than the hyenas, then the falcons must be fed later than the okapis. If the kangaroos are fed later than the hyenas, then the falcons must be fed earlier than the okapis.
   Exactly two animal groups must be fed between the feedings of the hyenas and the gorillas.
    The falcons must be fed immediately before or immediately after the gorillas.
    The hyenas are fed earlier than the okapis or monkeys, but not both.

1. Which one of the following could be the feeding schedule in order from first to seventh?

    (A) Kangaroos, iguanas, hyenas, okapis, falcons, gorillas, monkeys
    (B) Falcons, gorillas, okapis, hyenas, kangaroos, monkeys, iguanas
    (C) Iguanas, gorillas, monkeys, falcons, hyenas, kangaroos, okapis
    (D) Monkeys, iguanas, hyenas, kangaroos, falcons, gorillas, okapis
    (E) Okapis, gorillas, falcons, iguanas, hyenas, monkeys, kangaroos

2. Which one of the following animals CANNOT be fed fifth?

    (A) Iguanas
    (B) Monkeys
    (C) Kangaroos
    (D) Okapis
    (E) Falcons

3. If the kangaroos are fed immediately after the okapis, then which one of the following must be true?

    (A) The gorillas are fed second.
    (B) The kangaroos are fed second.
    (C) Either the iguanas or the monkeys are fed fourth.
    (D) Either the hyenas or the falcons are fed third.
    (E) Either the kangaroos or the monkeys are fed seventh.

4. Which one of the following could be an accurate partial list of the order in which the animals are fed?

    (A) First: falcons; second: gorillas; third: kangaroos
    (B) Second: gorillas; third: falcons; fourth: okapis
    (C) Fourth: kangaroos; fifth: hyenas; sixth: okapis
    (D) First: monkeys; second: okapis; third: hyenas
    (E) Fifth: falcons; sixth: gorillas; seventh: kangaroos

5. The exact feeding order of all seven animals can be determined if which one of the following is known?

    (A) The monkeys are first, and the kangaroos are sixth.
    (B) The monkeys are first, and the gorillas are sixth.
    (C) The kangaroos are second, and the okapis are fourth.
    (D) The falcons are third, and the iguanas are fourth.
    (E) The falcons are third, and the okapis are sixth.

6. Which one of the following is a complete and accurate list of the times, any one of which the kangaroos could be fed?

    (A) First, second, sixth, seventh
    (B) First, fourth, sixth, seventh
    (C) First, second, third, fifth, seventh
    (D) First, second, fifth, sixth, seventh
    (E) First, second, fourth, sixth, seventh

Feeding time

This simple line game had enough twists to keep you on your toes. These twists made this game very time-consuming. Most of the rules were easy enough, but Rules 2 and 5 required serious analysis. Rule 1 is the easiest rule, so it is the one to start with. G must be second or sixth. This is easily diagrammed. (Figure 1) To keep things clearer, for demonstration purposes we have used two separate lines, one for each possibility, but it is fine if you used one line. Skip Rule 2 and go to Rule 3, which ties into Rule 1. Rule 3 says: H _ _ G or G _ _ H. Thus, you can conclude that H must be third or fifth. Rule 4 requires that F must be on either side of G. This is more difficult to graph, but you could use a slash to indicate that F is only a 50% possibility, or you could put an (F) under the appropriate spaces. Both methods are shown below. Now return to Rule 2. Things are about to get complicated. If K is before H, then O is before F. If K is after H, O is after F. This is too variable to diagram, so it is better to make a note of the rule below the diagram. Even though this is phrased as an "if" rule, in reality it is a permanent rule, since K must always be either before or after H. So this rule always applies. Because this rule affects four of the seven members, it will play a role in every question. Finally, Rule 5 is a bit unusual. It says that H is before either O or M, but not both of them. So, either H is before O (and after M) or H is before M (and after O). This is too difficult to put on the diagram, so make a note of it underneath.

| F/? | G | ?/F | __ | H | __ | __ |
| (F) | | (F) | | | | |

| __ | __ | H | __ | F/? | G | ?/F |
| | | | | (F) | | (F) |
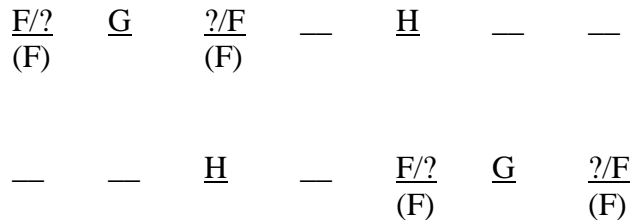
if K < H, then O < F
or
if H < K, then F < O

M < H < O
or
O < H < M

Fig. 1

1.   (D) – Although this is a complicated game, you can still use answer elimination. Starting with Rule 1, check each rule against each answer choice.
(A) Rule 5 does not allow H to be before both O and M.
(B) G and H must be separated by two spaces, by Rule 3.
(C) F must be immediately before or after G, by Rule 4.
(D) * This is a possible order. It violates no rules.

(E) This choice violates Rule 2. It has H before K, but O before F.

2.   (C) – Before doing each permutation, is there any answer choice that is easy
      to eliminate? First, look at the correct answer from question 1. You see that F
      is fifth. This allows you to eliminate answer choice (E). Next, I is a free
      agent, so I is unlikely to be prohibited in the fifth space. Now, the quickest
      way to find the correct answer is to do the permutations for the remaining
      three answer choices.
      (A) Since I is a free agent, you should not have checked this answer choice
          until you checked the other choices. It is possible to place I fifth. If I is
          fifth, clearly H is not fifth, so H is third. Therefore, G is sixth and F is
          seventh. Since F is seventh, it is impossible for K to be after H, so K will
          have to be first or second. Also, either M or O will have to be fourth. The
          other one will have to be first or second. For example: KMHOIGF.
      (B) If M is fifth, H must be third, G must be sixth, and F must be seventh.
          Because F is after O, K must be before H. K will have to be first or
          second. I must be fourth. O cannot be fourth because of Rule 5. O must
          be first or second. For example: KOHIMGF.
      (C) * K cannot be fifth. If K were fifth and G were sixth and so F were
          seventh, then H would be before K, but when H is before K, F must be
          before O. This can't happen if F is seventh.
      (D) O has the same analysis as M. For example: MKHIOGF
      (E) This choice was eliminated using the correct answer from question 1.

3.   (C) – You are provided with an O̲ K̲ block. Rules 2 and 5 will be relevant.
      Where might the O̲ K̲ block fit? If G is second and the O̲ K̲ block is third and
      fourth, H would be fifth, and F would be first. This would run afoul of Rule
      2. (Figure 2a) If G is second and the block is sixth and seventh, this will
      work. (Figure 2b). Try the mirror image of both of these and you find a
      similar result, the O̲ K̲ block can be first and second too. (Figure 2c) I and M
      can fill the remaining spaces in a variety of ways.
      (A) Although G can be second, it can also be sixth. This choice was for
          people who did not think about the alternate option.
      (B) Again, K can be second, but it can also be seventh.
      (C) * This is true. Either I or M must be fourth.
      (D) Although either H or F can be third, so could I or M.
      (E) M cannot be seventh.

F̲   G̲   O̲   K̲   H̲   __   __ – no!
Fig. 2a

F̲/?   G̲   ?̲/F   __   H̲   O̲   K̲
Fig. 2b

O   K   H   __   F/?   G   ?/F

Fig. 2c

4.   (B) – Although this question asks only about part of the order, you must solve for the validity of the whole order. There is no short cut; you must work through all the rules for each answer choice.

     (A) If you have the block of F G K starting on space one, then K is before H. Whenever K is before H, F is supposed to be after O, which is not the case here. See Rule 2.

     (B) * If you have a block of G F O starting on space two, then space five must be H. Since O is after F, K must be after H, by Rule 2. Also, M must be after H, by Rule 5. I must fill the first space. (Figure 3)

     (C) If K H O are fourth, fifth, and sixth, then K is before H. This means F is supposed to be after O. But F cannot be seventh, since it must be next to G, which is second.

     (D) An M O H block violates Rule 5 because both M and O precede H.

     (E) With F G K at the end of the series, K is after H, and this would require that F be before O, which clearly can't happen because there is now no place for O to go, except before F.

I   G   F   O   H   K/M   M/K

Fig. 3

5.   (A) – There is no easy short cut for this question. It requires diligently working though the answer choices. But if it becomes clear that there is more than one permutation, you can stop examining an answer choice since it is not the one you want.

     (A) * If K is sixth and M is first, then G must be second, F must be third, and H must be fifth. Since H is fifth, O must be seventh. The remaining space, space four, is filled with I. (Figure 4)

     (B) This is similar to, but not the same as, choice (A). If M is first and G is sixth, there are several possible orders. One is MKHOIGF, another is MKHIOGF, and a third is MIHKFGO.

     (C) If K is second and O is fourth, then H must be third and M must be first. G must be sixth, but F can be fifth or seventh, and I can be fifth or seventh.

     (D) This too looks like figure 4. If F is third and I is fourth, then G must be second and M must be first. H must be fifth, but K can be sixth or seventh, as can O.

     (E) There are two possibilities when F is third and O is sixth: MGFIHOK and IGFMHOK.

M   G   F   I   H   K   O

Fig. 4

6.   (E) – Before doing anything else, compare the five answer choices, looking for similarities and differences. You can see that most of the choices contain "first" and "second", so there is no point checking for those, simply assume they are true. Choice (B) does not have "second". Because (B) is an oddball choice, you should eliminate it. The remaining four choices all have "seventh", so there is no point checking that either. Three of the four choices have "sixth", so there is little point in checking that yet. Now consult the answer choices from previous questions. In question 2, you learned that K cannot be fifth, so eliminate choices (C) and (D). Of the remaining two choices, the only difference is "fourth." In question 1(D), you learned that K can be fourth. So this eliminates choice (A). As you can see, you can often answer this kind of question without doing much, or any, new work.

(A) See the analysis.
(B) See the analysis.
(C) See the analysis.
(D) See the analysis.
(E) * See the analysis.

Questions 1–6

Whenever a company takes delivery of a new computer, the
software technician must load at least one program from
each of the following three categories: word processing
programs—F, G, H; database programs—O, P, R; internet
browsers—T, U, W. When the software technician loads
the programs, the following requirements must be satisfied:

    An equal number of programs from each category must
      be loaded on the computer.
    T and P are not both loaded on the same computer.
    If R is loaded on a computer, U must also be loaded.
    O must be loaded on a computer if F is loaded on the
      computer.
    R is not loaded if P is loaded on the computer.

1. Which one of the following is an acceptable list of
   software programs to be loaded onto an employee's
   computer?

   (A) G, H, T
   (B) F, P, U
   (C) F, G, O, T, U, W
   (D) G, H, O, P, U, W
   (E) F, G, O, R, T, W

2. If R and W are loaded onto an employee's computer,
   then which one of the following must also be loaded
   onto the computer?

   (A) F
   (B) G
   (C) O
   (D) T
   (E) H

3. If P is the only database program loaded onto an
   employee's computer, how many possible
   combinations of programs could be added to that
   computer?

   (A) two
   (B) three
   (C) four
   (D) five
   (E) six

4. If two browsers are loaded onto an employee's
   computer, all of the following could be true,
   EXCEPT:

   (A) T and U are loaded.
   (B) R and O are loaded.
   (C) P and O are loaded.
   (D) F and G are loaded.
   (E) T and W are loaded

5. If F and T are loaded onto an employee's computer,
   each of the following could be true, EXCEPT:

   (A) O is the only database program loaded onto the
       computer.
   (B) G or H is loaded onto the computer.
   (C) O is loaded onto the computer.
   (D) P is loaded onto the computer.
   (E) U is loaded onto the computer.

6. If the condition that requires that an equal number of
   programs from each category must be selected is
   suspended, and all other conditions remain
   unchanged, what is the greatest number of programs
   that can be loaded onto an employee's computer?

   (A) five
   (B) six
   (C) seven
   (D) eight
   (E) nine

Software groups

This game requires a multi-group selection diagram. There are three groups from which you must choose certain members. This puzzle has a small twist on the classic diagram. Normally, a fixed number of members must be selected; five or six is typical. In this puzzle, there is a minimum of three—at least one member must be taken from each of the three categories. Another factor also influences the size of the ending group. Rule 1 requires that an equal number of programs must be selected from each category. So, you can conclude that if one program is selected from each category then there are a total of three programs. Furthermore, if two programs are selected from each category that would mean there are a total of six programs. Can three programs from each category be selected? No. Because of Rule 2 and Rule 5, you cannot select three from each category to get a total of nine members, because these two rules establish a practical maximum of eight members. So, going back to Rule 1, there are either three or six members in the final group.   The basic diagram requires positive one-way arrows and negative two-way arrows. (Figure 1) Given the large number of possible permutations, it is not advisable to do permutations in advance of the questions.
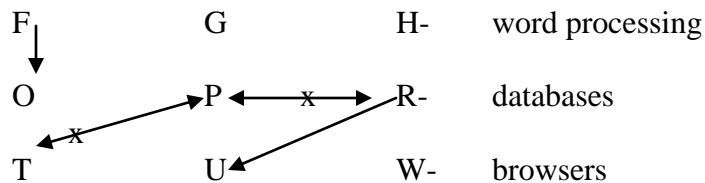

F   G   H-   word processing

O   P   x   R-   databases

T   U   W-   browsers

Fig. 1

1.   (D) – Using the rules to eliminate choices is, as usual, the most efficient technique.
   (A) This violates the initial set-up requirement that at least one program be selected from each of the categories.
   (B) This choice has F without O, violating Rule 4.
   (C) This choice shows two from the word processing group, one from databases, and three from browsers, violating Rule 1.
   (D) * This choice is valid.
   (E) This choice is invalid, because Rule 3 requires U to be selected when R is selected.

2.   (C) – Plugging the new information into figure 2 allows you to fill several of the blanks. When R is selected, U must be selected. U and W are two of the browsers. Since two browsers are selected, two databases and two word processing programs must be selected. Of the databases, when R is selected, P cannot be selected, thus O is selected. R and O are the two databases. Finally, you must select two programs from word processors F, G, and H. All three are equally valid.
   (A) F, G, and H have each a 50/50 chance of being selected.

(B) See (A).

(C) * Correct. O must be selected because P is not selected and there must be two databases.

(D) T can never be selected, because W takes the first browser slot and U takes the second slot.
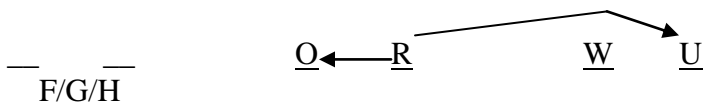
(E) See (A).

_ _
F/G/H

Fig. 2

3.   (C) – If there is only one database, then a total of three programs are selected. Since P is the only database, R is not used and O is not used. When O is not used, F cannot be used. G and H are wide-open free agents for the first slot. When P is used, T cannot be used. U and W can be used for the third slot. Note that the R to U link is a one-way arrow. This means U can be selected even if R is not. Do the permutations and count them up. (Figure 3) There are four.

(A) See the analysis.

(B) See the analysis.

(C) * See the analysis.

(D) See the analysis.

(E) See the analysis.

G	P	U
G	P	W
H	P	U
H	P	W

Fig. 3

4.   (E) – Since there are now two browsers, there must be a total of six programs. The quickest method is to review the answer choices for potential issues. If you don't see any possible issues, only then should you solve each permutation.

(A) It could be true that T and U are selected: GHORTU

(B) It could be true that R and O are selected, see (A).

(C) It could be true that P and O are selected, when W and U are selected.

(D) It could be true that F and G are selected; there are no restrictions on F, G, and H.

(E) * T and W cannot be selected. If you skimmed the answer choices and the initial diagram, you might have noticed that T, W, and U have quite a few

arrows pointing at them. This makes them interesting to us. If T and W are used, then P cannot be used, so R and O must be used. This causes a problem, because when R is used, U is supposed to be used. T and U can be selected or W and U can be selected. But T and W cannot. (Figure 4)

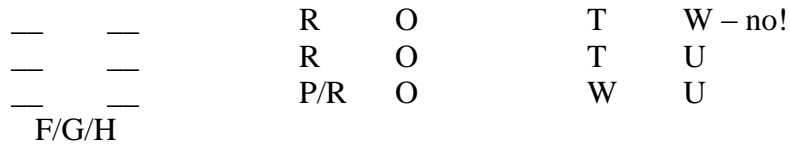| __	__	R	O		T	W – no!
__	__	R	O		T	U
__	__	P/R	O		W	U
F/G/H						

Fig. 4

5. (D) – This new information gives us quite a bit to work with. When F is selected, so is O. So the three programs could be FOT. But there could also be six programs. When T is selected, P is not selected. (Figure 5) When there are six programs, the absence of P means that R must be selected. Once R is selected, U must be selected. G and H are equally likely.
    (A) It could be true that O is the only database program, if there are three programs.
    (B) It could be true that either G or H is loaded.
    (C) It must be true that O is loaded.
    (D) * It cannot be true that P is loaded when T is loaded.
    (E) It could be true that U is loaded.

F ⟶ O   T

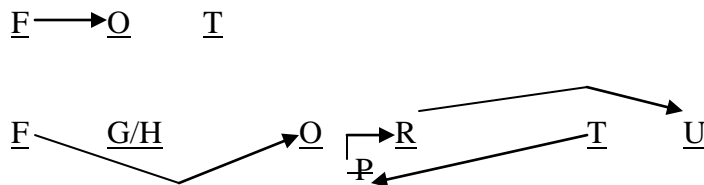F   G/H   O   R   T   U
              P

Fig. 5

6. (D) Rule modification questions are very difficult if they force you to go back and re-examine your entire diagram and all the warranted conclusions. In this case, the rule suspension is not difficult. Determine the maximum number. Examine the mutually exclusive members, P and T, and P and R. We can use the other eight members together, if we exclude P.
    (A) See the analysis.
    (B) See the analysis.
    (C) See the analysis.
    (D) * See the analysis.
   (E) See the analysis.

Questions 1–5

Brenda is selecting music for a party. She must select a total of six songs from among three dance songs—F, G, and H—three pop songs—M, N, and O—and three rock songs—W, X, Y. Two songs must be selected from each song type. The selection of songs must also satisfy the following conditions:

G and H cannot both be played at the party.
M and G cannot both be played at the party.
If N is played, then O must be played.
If X and M are both played, then X must be played earlier in the party than M.
If W and H are both played, then W is played immediately before H is played.
Either M or O is played first.
Either X or Y is played fifth.

1. Which one of the following could be a complete and accurate order of songs played, from first to sixth?

(A) O, N, G, X, Y, H
(B) M, F, N, H, X, Y
(C) M, O, H, W, Y, F
(D) O, X, M, F, Y, H
(E) N, O, Y, F, X, H

2. If M is played first, then which one of the following could be true?

(A) X is third.
(B) W is third.
(C) G is sixth.
(D) H is second.
(E) N is fourth.

3. Which one of the following songs must be played at the party?

(A) H
(B) G
(C) M
(D) O
(E) W

4. If M is played second, then which one of the following songs CANNOT be played?

(A) F
(B) H
(C) N
(D) W
(E) Y

5. If N is not played and Y and is not played, how many possible song orders can be played?

(A) one
(B) two
(C) three
(D) four
(E) five

Song selection

      At first, this game looked like it was going to be a standard multi-group selection game, in which you select a small final group from the members of three initial groups. But, then it threw in conditions that contain time/space limitations like "first" and "fifth" and "earlier" and "immediately before". At that point it became clear that this game requires both a grouping diagram and a line diagram. Fortunately, executing a grouping diagram and a line diagram is pretty straightforward for a well-trained LSAT taker like you. The first step is to get both diagrams started. The grouping diagram is the more important one. The first three rules are relevant to the grouping diagram and are easily diagrammed using one-way and two-way arrows. (Figure 1) Rules 4 and 5 deal with conditional situations, and are not so easily diagrammed. You may choose to use dotted lines to connect M and X and W and H. Or you may choose to place stars by these members, just to remind yourself of their special rule. Either way you choose to do it, it will be necessary to refer to these rules or their respective notes under the diagram. The final two rules are easily diagrammed on a simple line. (Figure 2) Remember, even if you use X on space five, you can still use Y elsewhere. The same applies to M and O. Now it is time to determine if there are any warranted conclusions that should be made. You are told there are exactly two selected from each song type. You can combine this with the other rules and conclude several things. Since dance songs G and H are mutually exclusive, dance song F must be used. For the pop songs, if N is used, then so is O. M and N cannot be used together, because this would activate Rule 3. So O is always used. For rock, you know that either X or Y must be used, but Rule 7 made this explicit. Penciling out permutations, you realize that M cannot be first if X is fifth. Also, when M is first and Y is fifth, then F, H, O, and W must all be used, and there are only a few permutations. When O is first, there are many more possible permutations. Instead of wasting time doing permutations you might not need, go to the questions now.
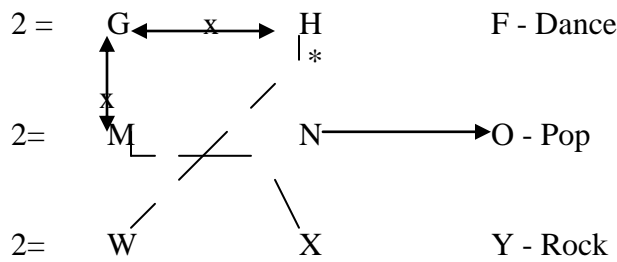
if X and M, X < M
if W and H, <u>W</u> <u>H</u>

<u>F</u>	<u>G/H</u>	‖<u>O</u>	<u>M/N</u>	‖<u>X/Y</u>	<u>X/Y/W</u>
2 Dance		‖ 2 Pop		‖ 2 Rock	

Fig. 1

$$\underline{\text{M/O}}_{1} \quad \underline{}_{2} \quad \underline{}_{3} \quad \underline{}_{4} \quad \underline{\text{X/Y}}_{5} \quad \underline{}_{6}$$

Fig. 2

1.   (D) – Use each of the rules to eliminate the answer choices that violate them. The remaining answer choice is the correct answer.
(A) This choice is wrong because it violates Rule 1, by having both G and H.
(B) This violates Rule 3, because it contains N, but not O. This also violates Rule 4 because when X and M are both played, X must be played before M.
(C) This violates Rule 5, because when H and W are played, W must be immediately before H.
(D) * This is a possible order.
(E) This violates Rule 6, because neither O nor M is first.

2.   (B) – After plugging in the new information you discover quite a few things. As discussed in the initial analysis, when M is first, X cannot be included in the play list at all. So W and Y must be played, and Y must be fifth. Also, when M is played G is not, therefore, F and H are played. When both H and W are played, W must immediately precede H. So there are four possible permutations. (Figure 3)
(A) As determined in the analysis, X cannot be played.
(B) * W can be third or second.
(C) G cannot be played at all, as was determined in the analysis.
(D) H can be third or fourth, but not second. Because W and H are present, H must come immediately after W, and the earliest W can appear is second.
(E) M and N cannot both be played, because when N is played, O must be played. That would make for three pop songs. But, there can only be two pop songs.

$$\underline{\text{M}}_{1} \quad \underline{\text{W}}_{2} \quad \underline{\text{H}}_{3} \quad \underline{\text{F/O}}_{4} \quad \underline{\text{Y}}_{5} \quad \underline{\text{O/F}}_{6}$$

$$\underline{\text{M}}_{1} \quad \underline{\text{F/O}}_{2} \quad \underline{\text{W}}_{3} \quad \underline{\text{H}}_{4} \quad \underline{\text{Y}}_{5} \quad \underline{\text{O/F}}_{6}$$

Fig. 3

3.   (D) – You can use the initial analysis and correct answers from the two previous questions since there is no new information in this question. Referring to previous work usually eliminates several incorrect answers. If

two or three answer choices remain, only then should you solve for those answer choices. Consulting the work from questions 7 and 8, you can see that it is definitely not necessary to use G. Eliminate choice (B). Consulting the correct answer from question 7, you see that it is definitely not necessary to use W. Eliminate choice (E). Although you could spend time pondering how the relationship of G and M affects this question, it is more efficient to simply do the permutations for the three remaining answer choices.

(A) H is not required. It is possible to form a play list without H: O, N, F, G, X, Y.

(B) G is not required, as proven in question 7.

(C) It is possible to form a play list that does not include M: O, F, H, N, Y, X

(D) * There is no way to form a play list without including O.

(E) See (C).

4. (C) – M plays a big role in this game because it has relationships with several other members. It actually is not necessary to diagram this question to figure out the correct answer. If M is second, then O must be first. Because two pop songs have now been used, N cannot be used. If you did not make this connection, it is still possible to diagram the possibilities. If M is second, O must be first. Since X cannot be played, Y must be played fifth. This leaves space three for W, space four for H, and space six for F. (Figure 4)

(A) F is in figure 4. When M is played, F must be played, because G is no longer available.

(B) Like F, H must be played, because G cannot be played.

(C) * N cannot be played, because O and M are played.

(D) W must be played. Because M is second, X cannot be played (because of Rule 4). This means that W and Y must be played.

(E) See (D).

O	M	W	H	Y	F
1	2	3	4	5	6

Fig. 4

5. (B) – Because N is not played, M and O must be played. Because M is played, G is not played. Therefore F and H must be played. Because Y is not played, X and W are. Because M and X are both played, X must be played before M. Since either X or Y must be fifth, X must be fifth, and M must be sixth. Finally, W and H must be played as a block. Since this question specifically asks for the number of permutations, do as many as you can and count them up. (Figure 5)

(A) See the analysis.

(B) * See the analysis.

(C) See the analysis.

(D) See the analysis.
(E) See the analysis.

O	W	H	F	X	M
1	2	3	4	5	6

O	F	W	H	X	M
1	2	3	4	5	6

Fig. 5