SECTION I

Time—35 minutes

25 Questions

Directions: Each group of questions in this section is based on a set of conditions. In answering some of the questions, it may be useful to draw a rough diagram. Choose the response that most accurately and completely answers each question and blacken the corresponding space on your answer sheet.

Questions 1–6

The manager of clothing store must fill two display windows with the following seven articles of clothing: hat, gloves, scarf, purse, earmuffs, shorts, and sweater. At least three, and at most, four items are displayed together according to the following conditions:

    The hat and gloves must be displayed together.
    The shorts must not be displayed with the sweater.
    If the purse is displayed with three other items, one of those items must be the scarf.

1. Which of the following is an acceptable arrangement of items that can be displayed together?

    (A) Shorts, earmuffs, scarf, hat
    (B) Sweater, shorts, purse, scarf
    (C) Sweater, scarf, earmuffs, purse
    (D) Shorts, sweater, earmuffs, scarf
    (E) Sweater, earmuffs, hat, purse

2. Which of the following could be a complete and accurate list of items displayed in the same window as the hat?

    (A) Shorts
    (B) Sweater, scarf
    (C) Gloves, shorts, purse, scarf
    (D) Shorts, sweater, shorts
    (E) Gloves, sweater, scarf

3. If the gloves and scarf are displayed in different windows, which of the following must be true?

    (A) The gloves are displayed with the sweater.
    (B) The purse is not displayed with the hat.
    (C) The hat is displayed with the scarf.
    (D) The purse is displayed with the earmuffs.
    (E) The hat is displayed with the earmuffs.

4. If the scarf is displayed with two additional items, which of the following could be displayed with the scarf?

    (A) The earmuffs and the purse.
    (B) The earmuffs and the hat.
    (C) The sweater and the purse.
    (D) The hat and the gloves.
    (E) The gloves and the earmuffs.

5. If the hat is displayed with three additional items, how many different items can be displayed at any given time with the hat?

    (A) 2
    (B) 3
    (C) 4
    (D) 5
    (E) 6

6. Which of the following must be true?

    (A) If the purse is displayed with exactly three items, one item is the shorts.
    (B) If the earmuffs are displayed with exactly two items, one item is a scarf.
    (C) If the hat is displayed, it is displayed with exactly three other items.
    (D) If the gloves are displayed, they are displayed with the purse.
    (E) Either the sweater or the shorts are displayed with the earmuffs.

GO ON TO THE NEXT PAGE.

Questions 7–12

Two students at a performing arts camp must each create a schedule with three or four classes. The students select, at most, one class from each of the following subjects: dance, brass band, orchestra, and theater. Each subject has three possible skill levels: intermediate, advanced, and expert. The students select their classes subject to the following conditions:

The students have no classes in common.
Neither student has classes at all three skill levels.
Each student has a different skill level for their brass band and orchestra classes.
Student 1 has advanced dance class.
Student 2 has exactly four classes.
Student 1 does not have a theater class.

7. Which of the following could be a complete schedule for both of the students?

(A) Student 1: advanced dance, intermediate brass band, advanced orchestra
Student 2: intermediate dance, advanced brass band, expert orchestra, intermediate theater
(B) Student 1: advanced dance, expert brass band, advanced orchestra, advanced theater
Student 2: intermediate dance, intermediate brass band, expert orchestra, expert theater
(C) Student 1: advanced dance, advanced brass band, expert orchestra
Student 2: expert dance, intermediate brass band, intermediate orchestra, expert theater
(D) Student 1: advanced dance, advanced brass band, expert orchestra
Student 2: intermediate dance, expert brass band, intermediate orchestra, intermediate theater
(E) Student 1: advanced dance, advanced brass band, expert orchestra
Student 2: intermediate dance, advanced brass band, intermediate orchestra, advanced theater

8. If student 2 has advanced brass band, which of the following could be true?

(A) Student 1 has advanced brass band.
(B) Student 1 has expert orchestra.
(C) Student 2 has intermediate brass band.
(D) Student 2 has advanced orchestra.
(E) Student 2 has expert dance.

9. Which of the following could be true?

(A) Student 1 has advanced brass band, and student 2 has advanced dance.
(B) Student 2 has intermediate theater, intermediate orchestra, and intermediate brass band.
(C) Student 1 has three advanced classes.
(D) The students have two classes in common.
(E) Student 2 has advanced brass band and advanced theater.

10. If at least four of the students' classes are intermediate skill level classes, which of the following must be true?

(A) Student 2 has advanced brass band.
(B) Student 2 has intermediate theater.
(C) Student 1 has at least two intermediate classes.
(D) Student 1 has at most two intermediate classes.
(E) Student 2 has at most two intermediate classes.

11. If there is only one intermediate level class, which of the following must be false?

(A) Student 2 has advanced orchestra.
(B) Student 1 has expert orchestra.
(C) Student 2 has intermediate theater.
(D) Student 1 has expert brass band.
(E) Student 2 has advanced brass band.

12. If Student 1 has advanced brass band, which of the following could be true?

(A) Student 2 has intermediate dance and advanced brass band.
(B) Student 1 has advanced orchestra, and student 2 has intermediate orchestra.
(C) Student 2 has intermediate brass band and expert orchestra.
(D) Student 2 has advanced theater and advanced dance.
(E) Student 2 has advanced brass band and advanced orchestra.

GO ON TO THE NEXT PAGE.

Questions 13–18

A convention planner must schedule seven consecutive speeches to be given during the convention. The six speakers who give speeches are: Arundel, Boyle, Canabra, Dalton, French, and Rial. The speeches must be scheduled subject to the following conditions:

Boyle must speak earlier than Dalton.
Rial must speak later than Arundel.
Arundel must speak immediately before or immediately after Boyle.
There must be exactly two speeches given between the speeches given by Canabra and Dalton.
French must speak first and must speak twice during the convention.

13. Which of the following could be a complete list of the speeches to be given, from first to last?

(A) French, Canabra, Arundel, Boyle, Rial, Dalton, French
(B) French, Canabra, Boyle, Arundel, Dalton, French, Rial
(C) French, Rial, Canabra, Arundel, Boyle, Dalton, Eric
(D) French, Arundel, Rial, Canabra, French, Boyle, Dalton
(E) French, Dalton, Boyle, Arundel, Canabra, Rial, French

14. If Canabra is scheduled seventh, which of the following must be true?

(A) Boyle speaks after Rial.
(B) Arundel speaks before Boyle.
(C) Dalton speaks before Rial.
(D) French speaks first and second.
(E) Rial speaks before Dalton.

15. Which of the following must be true?

(A) French never speaks third or fifth.
(B) Arundel or Boyle speaks third or fourth.
(C) Dalton always speaks after Canabra.
(D) Dalton never speaks before Rial.
(E) Canabra either speaks second or third.

16. The earliest Rial can speak is

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

17. If Canabra speaks before Rial speaks, each of the following could be true EXCEPT:

(A) French speaks seventh.
(B) French speaks fourth.
(C) Arundel speaks fourth.
(D) Boyle speaks third.
(E) Canabra speaks second or third.

18. The order of the speeches is completely determined if which of the following is true?

(A) Arundel is third, and Boyle is fourth.
(B) Arundel is fourth, and Boyle is fifth.
(C) Arundel is fourth, and Boyle is third.
(D) Canabra is third, and Rial is seventh.
(E) French is first and seventh.

GO ON TO THE NEXT PAGE.

Questions 19–24

A theater troupe will perform seven skits during an evening performance. The performers include five experienced actors–Ariana, Bronte, Carlow, Dabia, and Eric–and five novice performers–Nabiel, Sam, Thomas, Jackie, and Kyrasaki. Each performer will perform in exactly one skit according to the following requirements:
> Bronte and Nabiel and no one else perform one skit.
> Eric and Dabia and one novice perform one skit.
> The first performance features no novices.
> Carlow must perform after Bronte and Dabia.
> The final performance features one novice.

19. Which of the following could be a complete and accurate list of the skits, from first to last?

    (A) Ariana, Bronte and Nabiel, Carlow, Jackie, Thomas, Eric and Dabia and Sam, Kyrasaki
    (B) Thomas, Ariana, Bronte and Nabiel, Eric and Dabia and Thomas, Carlow, Jackie, Sam
    (C) Ariana, Jackie, Bronte, Eric and Dabia and Nabiel, Carlow and Thomas, Kyrasaki, Sam
    (D) Ariana, Sam, Kyrasaki, Jackie, Eric and Dabia and Thomas, Bronte and Nabiel, Carlow
    (E) Ariana, Bronte and Nabiel, Eric and Dabia and Thomas, Kyrasaki, Carlow, Jackie, Sam

20. Which of the following is a complete and accurate list of the skits that Bronte could participate in?

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

21. If Sam and Jackie perform later than all the experienced actors, which of the following must be true?

    (A) Thomas performs after Carlow.
    (B) Thomas performs before Eric.
    (C) Kyrasaki performs before Carlow.
    (D) Nabiel performs before Jackie.
    (E) Carlow performs fifth.

22. Which of the following performers could perform in the final skit?

    (A) Thomas
    (B) Nabiel
    (C) Carlow
    (D) Bronte
    (E) Ariana

23. What is the maximum number of skits that can be performed between the performances that include Kyrasaki and Carlow?

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

24. Suppose that the condition that the first skit includes no novices is replaced with the condition that the first two skits include only novices. If all the other conditions remain unchanged, which of the following CANNOT be true.

    (A) Thomas performs third.
    (B) Ariana performs seventh.
    (C) Bronte performs fifth.
    (D) Thomas performs seventh.
    (E) Carlow performs fifth.

S T O P

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS SECTION ONLY.
DO NOT WORK ON ANY OTHER SECTION IN THE TEST.

Answer key and explanations for test #1

Answer Key

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

Clothing display

This game utilized a typical multiple-line diagram. Line diagrams (which include simple lines and multiple lines) are the most frequently tested diagrams. Of the line diagrams, simple lines are most common. An important condition in this setup is that at least three items are displayed together, and a maximum of four can be displayed together. This makes things much easier. You will assign seven items to two groups: a group of three and a group of four. One of the groups will be displayed in window 1, while the other will be in window 2. (The windows are labeled to keep things organized and make explanations easier. The labels are arbitrary, since the setup and questions never specify a window by name.) The three rules are easy to understand and diagram. The diagram should reflect this simplicity. The only rule you can place directly on the diagram is that the sweater and shorts must always be kept apart. Use a 50/50 slash to note rule #2. (Figure 1) The other two rules cannot be placed on the diagram until the questions supply more information from the questions. Since there is not much yet to work with, you cannot make any easy warranted conclusions, so it is a better use of your time to go to the questions instead of doing permutations.

[HG]
Sw ≠ Sh or Sw/Sh
If P + 3 → 1 is Sc

Window 1   Window 2

__   __   Sw/Sh || __   __   __   Sh/Sw

OR

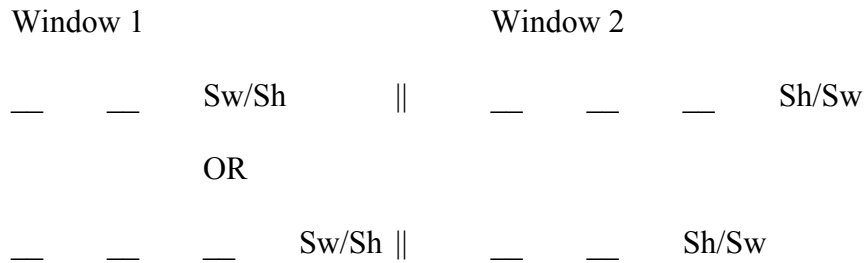__   __   __   Sw/Sh || __   __   Sh/Sw

Fig. 1

1.   (C) – Typically the first question in the set requires you to use each rule to eliminate one answer choice. Start with the first rule and see if it is violated in any of the answer choices. Then do the same for each of the other rules.
   (A) The hat and the gloves must be displayed together, so this violates rule #1.
   (B) The sweater and shorts must be displayed separately, so this violates rule #2.
   (C) * The display of the sweater, scarf, earmuffs, and purse does not violate any rules.
   (D) See (B).
   (E) When the purse is displayed with three items, it must be displayed with the scarf, so this violates rule #3. It also violates rule #1.

2

2.   (E) – Since the question directs your attention to the hat, review the rule that impacts the hat. The hat must be displayed with the gloves. Knowing this allows us to eliminate choices (A) and (B) right away. Now review the rest of the answer choices.
   (A) See the analysis.
   (B) See the analysis.
   (C) This choice has five items in the same display. This violates the initial condition that there is a maximum of four items on display together.
   (D) This choice incorrectly pairs the sweater and shorts, violating rule #2.
   (E) * This choice is a possible list of items displayed with the hat.

3.   (B) – For "must be true" questions, the answer choice must always be correct. The other choices will list things that are false, or things that may be true but are not required to be true. When you fill in the diagram of what is on display in window 1, remember to diagram both for three items on display and four items on display. First, where the gloves are displayed, so is the hat. (Figure 2) This fills the three-item display, requiring the purse and earmuffs to be in window 2. What about the four-item display? Can the earmuffs be displayed with the hat and gloves? Yes, the earmuffs are the free agent. Can the purse be displayed with the hat and gloves? No, because when the purse is displayed with three other items, one of them must be the scarf.

Window 1   Window 2

G——▶H   Sw/Sh || Sc   P▼   E▼   Sh/Sw

             OR

G   H   E   Sw/Sh || Sc   P   Sh/Sw
             P

Fig. 2

   (A) There is a fifty percent chance that the sweater is displayed with the gloves.
   (B) * Since the purse can never be displayed with the gloves in window 1, it also cannot be displayed with the hat.
   (C) In this scenario, the hat is never with the scarf.
   (D) The purse can be with the earmuffs, but is not always with them.
   (E) The hat is with the earmuffs in one of the two scenarios.

4.   (C) – Use the diagram. The scarf is displayed with two additional items and one of those items must always be either the sweater or the shorts. The third item cannot be the hat or the gloves, because those two must always be

together. (Figure 3) Now consider rule #3, which says that if the purse is with three other items, one must be the scarf. This prevents the purse from being with the hat and gloves. So the purse must be with the scarf in window 1.
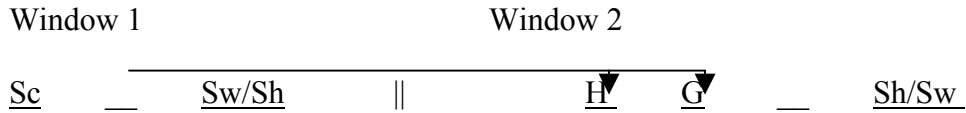
Window 1   Window 2

Sc   __   Sw/Sh || H̶ G̶   __   Sh/Sw

Fig. 3

(A) Both the earmuffs and the purse cannot be with the scarf. The purse must be with the scarf. The earmuffs cannot be with the scarf.
(B) The hat cannot be with the scarf.
(C) * It is possible to have the purse with the sweater. Review rule #3. The purse must be displayed with the scarf in this scenario, and the sweater may be displayed with them.
(D) Neither the hat nor the gloves can be with the scarf.
(E) The gloves cannot be with the scarf.

5.   (D) – This question resembles the previous question, but it does not have the exact same analysis. Diagram for the hat using a four-dash line. Since the hat and gloves "travel" together, this already fills two of the four dashes. You should fill one of the two remaining dashes with the mutually exclusive sweater/shorts. This leaves one dash to fill. The earmuffs are the free agent, so they could fill the spot. Can the scarf fill the spot? Yes, rule #3 does not prevent this. Finally, can the purse be displayed with the hat? No, rule #3 prevents this. Counting the items that can be with the hat, we see that the purse is the only item that cannot be displayed with the hat. Thus, when displayed with three other items, the hat can appear with any of five of the six total items. (Figure 4)
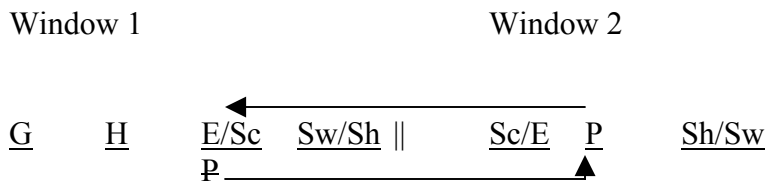
Window 1   Window 2

G   H   E/Sc   Sw/Sh || Sc/E   P   Sh/Sw
            P̶

Fig. 4

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

4

6.   (E) – Since this is a "must be true" question, you should be able to use previous work to narrow the choices. It may be necessary to do a little work with the answer choices.

(A) If you remembered that the sweater and shorts are interchangeable, you should have realized that neither of them *must* be with the purse.

(B) If the earmuffs are displayed with two other items, one of them must be the shorts or the sweater. The third item cannot be the hat or gloves. The third item must be the purse, not the scarf. Why? Because if the purse was in the second window, this would push the scarf to the first window, and this would violate rule #3.

(C) It is possible to display the hat with exactly two other items, for example, the gloves and shorts.

(D) Consult the diagram; the gloves and purse need not be displayed together. Often, they are not displayed together.

(E) * This is obviously true. Either the shorts or the sweater must always be in the same window as the earmuffs.

Camp classes

This game uses a common multiple-line diagram. Each student has either three or four classes. Rule #5 dictates that student #2 has exactly four classes. The reason that they both don't have four classes is that rule #6 dictates that student #1 does not have a theater class. This means that student #1 has exactly three classes and student #2 has exactly four classes. To depict this information, draw two parallel lines of three and four dashes each. Student #1 has advanced dance. Per rule #1, they can never have the same class, so we can conclude that student #2 cannot have advanced dance. You can mark this below or next to the appropriate space. Since there is no way to easily graph rule #1, you must remember not to put them both into the same skill level for any of the other classes. Rule #3 dictates that each of them has different skill levels for their brass band and orchestra classes. This condition is depicted in figure 1. Finally, rule #2 requires that the students each have a maximum of two skill levels. When we combine the effect of this rule with the effect of rule #3, we realize that each of the students must have exactly two skill levels; they cannot have just one skill level. There are no more immediately obvious warranted conclusions to be made, so quickly move to the questions.
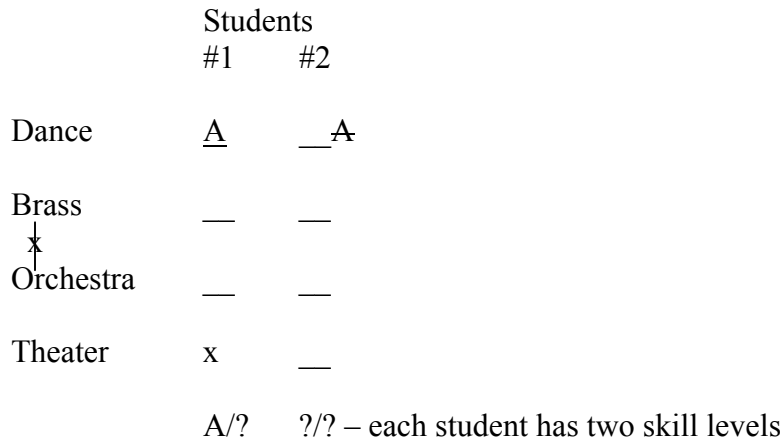
Students
#1   #2

Dance   A   A

Brass   —   —
x
Orchestra   —   —

Theater   x   —

A/?   ?/? – each student has two skill levels
Fig. 1

7.   (D) – Use each of the rules to eliminate the answer choices that violate them. The answer choice that remains is the correct answer.
      (A) This violates rule #2, because neither student can have a schedule that includes three skill levels.
      (B) This violates rule #6, because student #1 never has a theater class.
      (C) This violates rule #3, because a student cannot have both intermediate brass and orchestra classes.
      (D) * This is a permissible schedule.
      (E) This violates rule #1, because both students cannot have advanced brass band class.

8.   (E) – Start by graphing the new information. (Figure 2) Student #1 cannot have the same brass band class as student #2; therefore, student #1 cannot

6

have advanced brass. Also, student #1 must now have advanced orchestra, as a result of rule #3. This means student #1 must have intermediate or expert brass. Since student #2 cannot have advanced dance or advanced orchestra, he has either intermediate or expert classes for these subjects. That should be enough information to answer the question.

	#1	#2
Dance	A	__
Brass	I/E	A
Orchestra	A	__
Theater	x	__

Fig. 2

    (A) Student #1 cannot have advanced brass band class.
    (B) Student #1 cannot have expert orchestra because of rule #2.
    (C) Student #2 cannot have intermediate brass; this violates the given information.
    (D) Student #2 cannot have advanced orchestra, because he has advanced brass.
    (E) * Student #2 can have expert dance (or intermediate dance).

9.   (E) – This question is answerable based on the information we already have, though it will be necessary to graph some of the permutations.
    (A) Student #2 can never have advanced dance. (Figure 1)
    (B) A student cannot have the same skill level for brass and orchestra, rule #3.
    (C) See (B).
    (D) Rule #1 requires that the students never have classes in common.
    (E) * It is okay for student #2 to have advanced brass, and just about any skill level is okay for the theater class, as long as rule #2 is observed.

10.   (B) – This question requires a different approach. Think about the impact of having four intermediate classes. We know student #2 could schedule three intermediate classes, but not four, because of the effect of rule #3. The fourth intermediate class would have to be in student #1's schedule. Could student #2 have two intermediate classes? No, because student #1 cannot accommodate two intermediate classes. As you see in figure 3, the only uncertainty is about the brass and orchestra classes. This is enough information to answer the question.

	#1	#2
Dance	A	I
Brass	I/A	?/I
Orchestra	A/I	I/?
Theater	x	I

Fig. 3

(A) Student #2 may have intermediate (or advanced or expert) brass.
(B) Student #2 must have intermediate theater.
(C) Student #1 only has one intermediate class.
(D) See (C).
(E) * Student #2 must have exactly three intermediate classes.

11.   (C) – This question tests your creative scheduling skill in much the same way as the previous question did. When there is only one intermediate class, the question becomes which student has the intermediate class, i.e. where should you put the single intermediate class? If you put it with student #2, then it would have to be for the brass or orchestra class. Student #1 would then have advanced dance (a given), and advanced or expert brass band and orchestra. (Figure 4) Using figure 4, we can eliminate answer choices (B) and (D). Now try giving the intermediate class to student #1. The intermediate class would have to be brass band or orchestra. and the leftover class would be advanced. (Figure 5) In this case, student #2 would have expert dance for two reasons: first, because it can never have advanced dance, and second, because the single intermediate was already used. The rest of the classes for student #2 would have to be advanced or expert. This means that student #2 could never have an intermediate theater class.

	#1	#2
Dance	A	E
Brass	A/E	E/I
Orchestra	E/A	I/E
Theater	x	E

Fig. 4

	#1	#2
Dance	<u>A</u>	E
Brass	<u>I/A</u>	<u>A/E</u>
x		
Orchestra	<u>A/I</u>	<u>E/A</u>
Theater	x	<u>E/A</u>

Fig. 5

    (A) Figure 5 shows that student #2 can have advanced orchestra.

    (B) In figure 4, student #1 has expert orchestra.

    (C) * Student #2 cannot have intermediate theater. If he did, this would cause problems, since this would leave only advanced and expert classes available for student #1 and only advanced or expert classes available for student #2. No matter how you try to schedule around this limitation, there would always be one subject where they would have the same skill level.

    (D) Figure 4 shows that it is possible for student #1 to have expert brass band.

    (E) Figure 5 shows that student #2 can have advanced brass band.

12.   (C) – Simply plug in the new information. You can now conclude that student #1 has either intermediate or expert orchestra, as a result of rule #3. You know that student #2 cannot have the same skill levels as student #1, but that does not make things much clearer. Figure 6 contains the conclusions you can make. Since there are no more obvious conclusions to be made, turn your attention to the answer choices and do additional work if necessary.

	#1	#2
Dance	<u>A</u>	E/I
Brass	<u>A</u>	E/I
x		
Orchestra	<u>I/E</u>	<u>E/I/A</u>
Theater	x	<u>E/I/A</u>

Fig. 6

    (A) A quick check of the diagram shows that student #2 cannot have advanced brass band.

(B) Student #1 cannot have advanced orchestra.
(C) * Since the diagram is ambiguous, it requires a little work to confirm that this choice is correct.
(D) Student #2 cannot have advanced dance, because student #1 has advanced dance.
(E) Student #2 cannot have advanced brass band.

Convention speeches

In this puzzle, you must effectively utilize a simple line diagram, as well as greater-than—less-than notation. The basic setup is pretty obvious—seven dashes. The only quirk, and it ends up being a minor one, is that there are six speakers, so French must speak twice. Whenever possible, you must combine two or more rules into a single compound rule. For example, Boyle is earlier than Dalton and Arundel is immediately before or after Boyle. Therefore, Arundel is earlier than Dalton. It is this kind of warranted conclusion that you must always be on the look out for. Since the Canabra and Dalton rule covers so much geography in the diagram, use it as the starting point. The graph in figure 1 shows all the rules, and the combination rules.

```
        F_
         —    —    —    —    —    —    —
B<D     D                                    B
A<R     R                                    A
A B     B                          A
C _ _ D
Or
D _ _ C
```

Combine the rules:

```
            C _ _ D        or        D _ _ C
    ←——————————————|            ←———————|
      B/A                        B/A     |
        |————————————▶             |———————▶
             R                        R
```
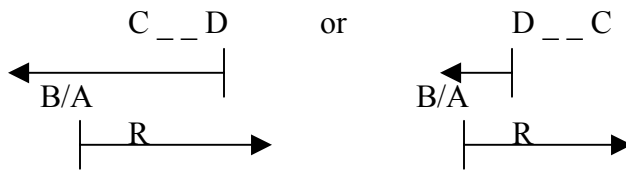
Fig. 1

Rather than attempt to draw warranted conclusions (beyond combining the rules), it is more efficient to go directly to the questions. With a complicated compound rule like this one, you could waste a lot of time looking for warranted conclusions that may not be there.

13.   (B) – This possible order question is no different than any other. Start with the first rule, eliminate an answer choice, and work your way down the list of rules.
(A) Canabra cannot be separated by three spaces from Dalton, rule #4.
(B) * This is possible. Make note of this order, since this correct answer may come in handy when answering a later question.
(C) This violates rule #2 by putting Rial before Arundel
(D) This violates rule #3 by separating Arundel and Boyle.
(E) This violates rule #1 by putting Boyle after Dalton.

14. (C) – It is a simple matter to put Canabra seventh. Building from there, Dalton must be fourth. Boyle (and Arundel) must therefore be second or third, you cannot know exactly where. This leaves spaces five and six open for Rial and the second French speech. (Figure 2)

F   A/B   A/B   D   R/F   F/R   C

Fig. 2

  (A) Rial must speak after Dalton, and Boyle must speak before Dalton.
  (B) Arundel may or may not speak before Boyle; they are interchangeable.
  (C) * Dalton definitely speaks before Rial.
  (D) French must speak either sixth or seventh.
  (E) Rial speaks after Dalton.

15. (B) – There is a right way and a wrong way to find the correct answer for this question. The wrong way is to try all the permutations for each answer choice. That is a big waste of time. The right way is to review the correct answers and diagrams from the previous two questions and eliminate answer choices that contradict those previous correct answers.
  (A) In question 14, you saw that French can speak fifth.
  (B) * By process of elimination, you would discover that this is the correct answer. Although you could do the permutations necessary to prove this, that would be a terrible use of your limited time.
  (C) In question 14, you saw that Dalton can speak before Canabra.
  (D) In question 14, you saw that Dalton can speak before Rial.
  (E) In question 14, you saw that Canabra can speak seventh.

16. (D) – Before doing the work, review the previous questions. In question 14, we learned that Rial can be fifth, so we can eliminate answer choice (E). Now start with the lowest number and work up. Can Rial be second? No, because, at a minimum, French, Boyle, and Arundel must precede Rial. Does that mean that Rial can be fourth? Probably not, but do the diagramming to make sure. If Rial were fourth, there would not be enough space left to accommodate two spaces between Canabra and Dalton. So can Rial be fifth? Yes, this would allow French, Arundel, Boyle, and Dalton/Canabra to fill the first four spaces.
  (A) Since Rial must be preceded by French and Arundel, Rial cannot be second.
  (B) Since Rial must be preceded by French, Arundel, and Boyle, Rial cannot be third.
  (C) Since putting Rial fourth would prevent Canabra and Dalton from being properly placed, Rial cannot be fourth.
  (D) * The earliest Rial can be placed is fifth.

(E) Rial can be placed fifth. You did not need to check this answer choice.

17.   (B) – Since four of the answer choices will be correct, and only one will be false, the most efficient approach is to graph each answer choice. The one that is not graphable is the correct answer.
(A) This could be graphed as FCABDRF.
(B) * This cannot be graphed. When French is fourth, there is not sufficient room to accommodate Canabra and Dalton and the two spaces between them, because Arundel and Boyle must occupy spaces two and three.
(C) This can be graphed as FCBADRF.
(D) See (C).
(E) See (C). Also, this can be graphed as FFCABDR.

18.   (B) – The only way to do this question will be to graph the choices. But before graphing the answer choices, think about the two-speech block of Arundel and Boyle. Unless their positions are fixed by an answer choice, they will always be interchangeable, since they have no fixed order relative to each other. So focus on the answer choices that fix Arundel and/or Boyle.
(A) If you graph Arundel and Boyle third and fourth respectively, Rial and the second French are still interchangeable in the sixth and seventh positions: FCABD??
(B) * If you graph Arundel and Boyle in fourth and fifth respectively, then Canabra and Doyle are forced into positions, which forces French and Rial into positions. The order of all the speakers is fixed as: FFCABDR.
(C) This is the same result and same analysis as choice (A). Remember, Arundel and Boyle are interchangeable with respect to each other.
(D) If Canabra is third, then Dalton is sixth. This would leave Arundel and Boyle in fourth and fifth, but we don't know which one is where: FFC??DR.
(E) When French is first and seventh, this fixes Canabra, Doyle, and Rial, but not Arundel or Boyle: FC??DRF.

Performing skits

The final set is yet another line problem. There is one quirky feature in this simple line. There are a total of ten people in two groups who must be assigned to seven open slots. This will lead to multiple people on some slots. In order to get anywhere, you must combine the rules. Both B and D feature in two rules, combine these rules to show that B (and N) and D (and E and one novice) are both earlier than C. Now count heads. Four of the five experienced actors (B, C, D, and E) have been graphed. Now it is necessary to have the important insight—the "eureka" moment. The first performance has no novices, so it must be an expert. That expert cannot be B, D, or E because they all have novices with them. That expert also cannot be C because C cannot be earlier than B, D, and E. The only expert left is A. Therefore, A is first and alone. (Figure 1) The second vital insight is that all four of the remaining novices can be anywhere, as long as one of them does the seventh skit. The third and final necessary insight is that the two skits with multiple performers have absorbed the extra three actors, so all the other actors will perform alone. This means that C cannot be seventh with one of the novices, because this would leave one skit unmanned.

<u>A</u>　 —　 —　 —　 —　 —　 —

[Bn]
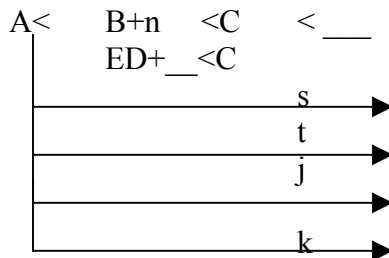[ED+novice]
#1 not novice
B<C, D<C
#7 is a novice

A<　 B+n　 <C　 < __
　　　ED+__<C

Fig. 1

19.　(E) – Reviewing the rules will allow you to find the answer choice in just a few seconds.
　(A) Dabia must be before Carlow, per rule #4.
　(B) The first performance must be Ariana alone; it cannot be a novice, per rule #3.
　(C) Bronte and Nabiel must perform together, per rule #1.
　(D) Carlow is an experienced actor, and only novice actors are permitted to be seventh, per rule #5. Plus, the warranted conclusion is that the final performance must be done by a single actor.

14

(E) * This is a valid order.

20.   (C) – The first thing to note that choices (C), (D), and (E) are pretty similar. It
        is highly likely that one of them is the correct answer and that (A) and (B) are
        wrong. It is unnecessary to check whether Bronte can be second, third, or
        fourth, since these are listed in most or all of the answer choices. The easiest
        way to approach this question is to work from the end to figure out the latest
        skit Bronte can feature in. Since at least one novice must come after Carlow,
        and Carlow must come after Bronte, the latest Bronte could appear is fifth.
        Since answer choice (C) is the only one left that does not contain "sixth," it is
        likely the correct answer. If you were short on time you could stop here,
        move on to the next question, and be highly confident that (A) and (B) are not
        correct. As you can see, having a strategy can help you dispense with doing
        time-consuming analysis.
        (A) There is no reason Bronte cannot be second, for example. The correct
            answer for question 19 has Bronte second.
        (B) See (A).
        (C) * Since we know that Bronte cannot be sixth, this is the best choice.
        (D) Bronte cannot be sixth.
        (E) Bronte cannot be sixth.

21.   (D) – Sam and Jackie are novices. If they perform after all the experienced
        actors finish, it means they perform after Carlow. This leaves either Thomas
        or Kyrasaki to perform with Eric and Dabia. Then either Thomas or Kyrasaki
        (whichever one that did not perform with Eric and Dabia) is a free agent who
        can perform anytime after A.
        (A) It is just as likely that Thomas performs prior to Carlow as after him.
        (B) Thomas could perform before Eric, after Eric, or with Eric.
        (C) Kyrasaki has the same analysis as Thomas in (A).
        (D) * This is true. If Jackie is after the last experienced actor (Carlow) and
            Nabiel must always be with Bronte (who must be prior to Carlow), then
            Nabiel must always be before Carlow and thus be before Jackie.
        (E) It is possible that Carlow performs fifth, as long as either Thomas or
            Kyrasaki is prior to Carlow. However, this is not a "must be true" answer.

22.   (A) – This simple question tests your understanding of the initial diagram.
        (A) * Thomas is a free agent and a novice. Thus, Thomas can be the final
            performer.
        (B) Nabiel is a novice but is also linked with Bronte, who must perform prior
            to Carlow. So Nabiel cannot be the final performer.
        (C) Carlow is an experienced actor, so he cannot be the final performer.
        (D) See (C).
        (E) See (C). Ariana must be first.

23.   (C) – This question requires a little creativity. We know that the final performance is a novice, but Carlow could be sixth. What is the earliest that Kyrasaki can appear? Since Kyrasaki is a free agent, there is no reason why he cannot be second, with Eric and Dabia. Counting the spaces, the third, fourth, and fifth performances can separate Kyrasaki and Carlow.
(A) See the analysis.
(B) See the analysis.
(C) * See the analysis.
(D) See the analysis.
(E) See the analysis.

24.   (B) Once in awhile, the final question in the set will suspend or replace one of the initial conditions. This kind of question can get ugly, and this one is no exception. When you are faced with this situation, you need to make a gut decision whether to attempt to solve it, or guess and move on. The problem with attempting this kind of question is that it is highly confusing to suspend or replace a condition that you have become accustomed to using. Normally, you have to go back to square one and rework all the conditions to accommodate the change. Doing so means throwing out all the warranted conclusions you made. To solve this one, consult figure 2 and follow along. Starting from scratch on this problem, the first two performances are easy to graph. Is Ariana now the third performance? Not necessarily. The only reason Ariana was first was because an experienced actor was required to be first, and Ariana was the only experienced actor that could fill the role (pardon the pun). Ariana can be anywhere between the second performance and the seventh performance. Ariana cannot be seventh, because that skit is still reserved for a novice.

—   —   —   —   —   —   —
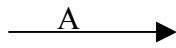
[Bn]
[ED+novice]
#1 not novice
B<C, D<C
#7 is novice

A →
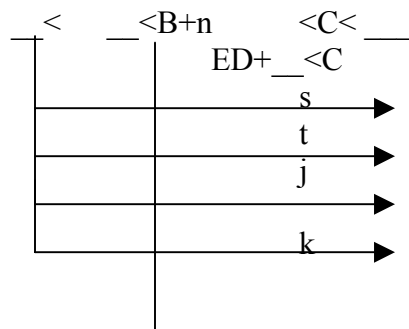
Fig. 2

(A) Thomas may perform in any of the seven slots.
(B) * Ariana cannot perform seventh.
(C) Bronte can perform third, fourth, or fifth.
(D) See (A).
(E) Carlow can perform fifth or sixth.