SECTION I

Time—35 minutes

24 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 1–7

Eight physics students—four majors: Frank, Gwen, Henry, and Joan; and four nonmajors: Victor, Wanda, Xavier, and Yvette—are being assigned to four laboratory benches, numbered 1 through 4. Each student is assigned to exactly one bench, and exactly two students are assigned to each bench. Assignments of students to benches must conform to the following conditions:

Exactly one major is assigned to each bench.
Frank and Joan are assigned to consecutively numbered benches, with Frank assigned to the lower-numbered bench.
Frank is assigned to the same bench as Victor.
Gwen is not assigned to the same bench as Wanda.

1. Which one of the following could be the assignment of students to benches?

(A) 1: Frank, Victor; 2: Joan, Gwen; 3: Henry, Wanda; 4: Xavier, Yvette
(B) 1: Gwen, Yvette; 2: Frank, Xavier; 3: Joan, Wanda; 4: Henry, Victor
(C) 1: Henry, Wanda; 2: Gwen, Xavier; 3: Frank, Victor; 4: Joan, Yvette
(D) 1: Henry, Xavier; 2: Joan, Wanda; 3: Frank, Victor; 4: Gwen, Yvette
(E) 1: Henry, Yvette; 2: Gwen, Wanda; 3: Frank, Victor, 4: Joan, Xavier

2. If Victor is assigned to bench 2 and Wanda is assigned to bench 4, which one of the following must be true?

(A) Frank is assigned to bench 1.
(B) Gwen is assigned to bench 1.
(C) Henry is assigned to bench 3.
(D) Xavier is assigned to bench 1.
(E) Yvette is assigned to bench 3.

3. If Gwen and Henry are not assigned to consecutively numbered benches, which one of the following must be true?

(A) Victor is assigned to bench 2.
(B) Victor is assigned to bench 3.
(C) Wanda is assigned to bench 1.
(D) Wanda is assigned to bench 3.
(E) Wanda is assigned to bench 4.

4. If Henry and Yvette are both assigned to bench 1, which one of the following could be true?

(A) Gwen is assigned to bench 3.
(B) Joan is assigned to bench 2.
(C) Wanda is assigned to bench 2.
(D) Wanda is assigned to bench 3.
(E) Xavier is assigned to bench 3.

5. If Gwen is assigned to bench 4 and Xavier is assigned to bench 3, then any one of the following could be true EXCEPT:

(A) Gwen is assigned to the same bench as Yvette.
(B) Henry is assigned to the same bench as Wanda.
(C) Henry is assigned to the same bench as Xavier.
(D) Joan is assigned to the same bench as Xavier.
(E) Joan is assigned to the same bench as Yvette.

6. If Wanda is assigned to a lower-numbered bench than is Joan, then Henry must be assigned to a

(A) lower-numbered bench than is Frank
(B) lower-numbered bench than is Gwen
(C) lower-numbered bench than is Xavier
(D) higher-numbered bench than is Victor
(E) higher-numbered bench than is Yvette

7. Which one of the following could be the assignments for bench 2 and bench 4?

(A) 2: Gwen, Xavier
4: Henry, Yvette
(B) 2: Henry, Yvette
4: Joan, Xavier
(C) 2: Joan, Victor
4: Gwen, Xavier
(D) 2: Joan, Wanda
4: Gwen, Xavier
(E) 2: Joan, Xavier
4: Henry, Yvette

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Questions 8–12

A messenger will deliver exactly seven packages—L, M, N, O, P, S, and T—one at a time, not necessarily in that order. The seven deliveries must be made according to the following conditions:

P is delivered either first or seventh.

The messenger delivers N at some time after delivering L.

The messenger delivers T at some time after delivering M.

The messenger delivers exactly one package between delivering L and delivering O, whether or not L is delivered before O.

The messenger delivers exactly one package between delivering M and delivering P, whether or not M is delivered before P.

8. Which one of the following is an order in which the messenger could make the deliveries, from first to seventh?

(A) L, N, S, O, M, T, P
(B) M, T, P, S, L, N, O
(C) O, S, L, N, M, T, P
(D) P, N, M, S, O, T, L
(E) P, T, M, S, L, N, O

9. Which one of the following could be true?

(A) N is delivered first.
(B) T is delivered first.
(C) T is delivered second.
(D) M is delivered fourth.
(E) S is delivered seventh.

10. If N is delivered fourth, which one of the following could be true?

(A) L is delivered first.
(B) L is delivered second.
(C) M is delivered third.
(D) O is delivered fifth.
(E) S is delivered first.

11. If T is delivered fourth, the seventh package delivered must be

(A) L
(B) N
(C) O
(D) P
(E) S

12. If the messenger delivers M at some time after delivering O, the fifth package delivered could be any one of the following EXCEPT:

(A) L
(B) M
(C) N
(D) S
(E) T

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Questions 13–18

Each of exactly five persons—Nguyen, Olson, Pike, Tyner, and Valdez—participates in exactly one of three activities: going to a movie, going to a soccer game, or going to a restaurant. The following conditions must apply.

Nguyen and Olson do not participate in the same activity as each other, nor does either one of them participate in the same activity as Pike.

Exactly two persons go to a soccer game.

Tyner and Pike do not participate in the same activity as each other.

If Nguyen or Valdez goes to a movie, they both go to a movie.

13. Which one of the following could be an accurate list of the activities participated in by Nguyen, Olson, Pike, Tyner, and Valdez, respectively?

(A) movie, soccer game, soccer game, restaurant, movie
(B) movie, restaurant, soccer game, soccer game, movie
(C) soccer game, restaurant, movie, soccer game, movie
(D) soccer game, restaurant, movie, soccer game, restaurant
(E) soccer game, restaurant, movie, soccer game, soccer game

14. If Valdez goes to a soccer game, then each of the following could be true EXCEPT:

(A) Olson goes to a movie.
(B) Nguyen goes to a restaurant.
(C) Nguyen goes to a soccer game.
(D) Tyner goes to a soccer game.
(E) Tyner goes to a movie.

15. Which one of the following is a pair of persons who could go to a movie together?

(A) Nguyen and Tyner
(B) Olson and Tyner
(C) Olson and Valdez
(D) Pike and Olson
(E) Pike and Tyner

16. Each of the following statements must be false EXCEPT:

(A) Only Olson goes to a restaurant.
(B) Only Pike goes to a restaurant.
(C) Only Tyner goes to a restaurant.
(D) Only Valdez goes to a restaurant.
(E) Tyner and Valdez go to a restaurant together.

17. If Nguyen goes to a soccer game, then which one of the following is a complete and accurate list of the persons any one of whom could go to a movie?

(A) Olson
(B) Pike, Valdez
(C) Olson, Tyner
(D) Pike, Tyner, Valdez
(E) Olson, Pike, Tyner

18. If the condition that exactly two persons go to a soccer game is changed to require that exactly three persons go to a soccer game, but all other conditions remain the same, then which one of the following persons must participate in an activity other than going to a soccer game?

(A) Nguyen
(B) Olson
(C) Pike
(D) Tyner
(E) Valdez

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Questions 19–24

In each of two years exactly two of four lawmakers—Feld, Gibson, Hsu, and Ivins—and exactly two of three scientists—Vega, Young, and Zapora—will serve as members of a four-person panel. In each year, one of the members will be chairperson. The chairperson in the first year cannot serve on the panel in the second year. The chairperson in the second year must have served on the panel in the first year. Service on the panel must obey the following conditions:

Gibson and Vega do not serve on the panel in the same year as each other.

Hsu and Young do not serve on the panel in the same year as each other.

Each year, either Ivins or Vega, but not both, serves on the panel.

19. Which one of the following could be the list of the people who serve on the panel in the first year?

(A) Feld, Gibson, Vega, Zapora
(B) Feld, Hsu, Vega, Zapora
(C) Feld, Ivins, Vega, Zapora
(D) Gibson, Hsu, Ivins, Zapora
(E) Hsu, Ivins, Young, Zapora

20. If Vega is the chairperson in the first year, which one of the following is a pair of people who must serve on the panel in the second year?

(A) Gibson and Young
(B) Gibson and Zapora
(C) Hsu and Ivins
(D) Ivins and Young
(E) Vega and Young

21. If Hsu is the chairperson in the first year, which one of the following could be the chairperson in the second year?

(A) Feld
(B) Gibson
(C) Hsu
(D) Ivins
(E) Young

22. IF Feld serves on the panel in a given year, any one of the following could serve on the panel that year EXCEPT:

(A) Gibson
(B) Hsu
(C) Ivins
(D) Vega
(E) Young

23. If Ivins is the chairperson in the first year, which one of the following could be the chairperson in the second year?

(A) Feld
(B) Gibson
(C) Hsu
(D) Vega
(E) Young

24. Which one of the following must be true?

(A) Feld is on the panel in the second year.
(B) Hsu is on the panel in the first year.
(C) Ivins is on the panel in both years.
(D) Young is on the panel in both years.
(E) Zapora is on the panel in the second year.

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.