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 1–6

A newly formed company has five employees—F, G, H, K, and L. Each employee holds exactly one of the following positions: president, manager, or technician. Only the president is not supervised. Other employees are each supervised by exactly one employee, who is either the president or a manager. Each supervised employee holds a different position than his or her supervisor. The following conditions apply:

There is exactly one president.
At least one of the employees whom the president supervises is a manager.
Each manager supervises at least one employee.
F does not supervise any employee.
G supervises exactly two employees.

1. Which one of the following is an acceptable assignment of employees to the positions?

	President	Manager	Technician
(A)	G	H, K, L	F
(B)	G	H	F, K, L
(C)	H	F, G	K, L
(D)	H, K	G	F, L
(E)	K	F, G, H, L	—

2. Which one of the following must be true?

(A) There are at most three technicians.
(B) There is exactly one technician.
(C) There are at least two managers.
(D) There are exactly two managers.
(E) There are exactly two employees who supervise no one.

3. Which one of the following is a pair of employees who could serve as managers together?

(A) F, H
(B) F, L
(C) G, K
(D) G, L
(E) K, L

4. Which one of the following could be true?

(A) There is exactly one technician.
(B) There are exactly two managers.
(C) There are exactly two employees who are not supervised.
(D) There are more managers than technicians.
(E) The president supervises all of the other employees.

5. If F is supervised by the president, which one of the following must be true?

(A) G is the president.
(B) H is the president.
(C) L is a technician.
(D) There is exactly one manager.
(E) There are exactly two technicians.

6. If K supervises exactly two employees, which one of the following must be true?

(A) F is supervised by K.
(B) G is a manager.
(C) L is supervised.
(D) There are exactly two managers.
(E) There are exactly two technicians.

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Questions 7–12

Ron washed a total of seven objects after eating his lunch. Two of the objects were pieces of china: a mug and a plate. Two were pieces of glassware: a water glass and a juice glass. Three were utensils: a fork, a knife, and a spoon. Ron washed the two pieces of china consecutively, the two glasses consecutively, and the three utensils consecutively. He washed the objects as follows:

Ron washed each of the objects exactly once.
Ron washed the glassware after either the china or the utensils but not after both.
He washed the knife before the spoon, and he washed the mug before the plate.
He did not wash any two objects at the same time.

7. Which one of the following statements CANNOT be true?

(A) Ron washed the fork first.
(B) Ron washed the fork second.
(C) Ron washed the mug first.
(D) Ron washed the plate second.
(E) Ron washed the plate third.

8. Which one of the following statements can be true?

(A) Ron washed the knife second.
(B) Ron washed the knife seventh.
(C) Ron washed the mug second.
(D) Ron washed the mug third.
(E) Ron washed the mug fourth.

9. Which one of the following CANNOT be an accurate list of the objects Ron washed second, third, and fourth, respectively?

(A) fork, spoon, water glass
(B) knife, fork, juice glass
(C) knife, spoon, juice glass
(D) knife, spoon, water glass
(E) plate, water glass, juice glass

10. It is NOT possible that Ron washed the knife

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

11 If Ron washed the spoon immediately before the fork, then which one of the following statements can be true?

(A) He washed the knife second.
(B) He washed the knife third.
(C) He washed the plate third.
(D) He washed the plate sixth.
(E) He washed the plate seventh.

12. If Ron washed a glass and the knife consecutively, but not necessarily in that order, then which one of the following statements must be false?

(A) He washed the fork before the plate.
(B) He washed the fork before the spoon.
(C) He washed the juice glass before the knife.
(D) He washed the plate before the water glass.
(E) He washed the spoon before the fork.

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Questions 13–18

A breeder has ten birds:

Kind	Male	Female
Goldfinches	H	J, K
Lovebirds	M	N
Parakeets	Q, R, S	T, W

The breeder exhibits pairs of birds consisting of one male and one female of the same kind. At most two pairs can be exhibited at a time; the remaining birds must be distributed between two cages. The breeder is constrained by the following conditions:

Neither cage can contain more than four birds.

Any two birds that are both of the same sex and of the same kind as each other cannot be caged together.

Whenever either J or W is exhibited, S cannot be exhibited.

13. Which one of the following is a possible assignment of the birds?

	First Cage	Second Cage	Exhibition
(A)	H, M, N	J, K, S	Q, R, T, W
(B)	K, M, Q	N, R, W	H, J, S, T
(C)	K, Q, S	R, T, W	H, J, M, N
(D)	H, J, M, R	K, N, S, W	Q, T
(E)	H, J, M, R, W	K, N, S	Q, T, W

14. Which one of the following lists two pairs of birds that the breeder can exhibit at the same time?

(A) H and J; M and N
(B) H and J; S and T
(C) H and K; M and N
(D) H and K; R and W
(E) M and N; S and W

15. If Q and R are among the birds that are assigned to the cages, then it must be true that

(A) H is exhibited
(B) K is exhibited
(C) N is exhibited
(D) J is assigned to one of the cages
(E) T is assigned to one of the cages

16. If Q and T are among the birds assigned to the cages, which one of the following is a pair of birds that must be exhibited?

(A) H and J
(B) H and K
(C) M and N
(D) R and W
(E) S and W

17. Which one of the following CANNOT be true?

(A) One pair of parakeets are the only birds exhibited together.
(B) One pair of goldfinches and one pair of lovebirds are exhibited together.
(C) One pair of goldfinches and one pair of parakeets are exhibited together.
(D) One pair of lovebirds and one pair of parakeets are exhibited together.
(E) Two pairs of parakeets are exhibited together.

18. If S is one of the birds exhibited, it must be true that

(A) H is exhibited
(B) M is exhibited
(C) K is assigned to a cage
(D) N is assigned to a cage
(E) R is assigned to a cage

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Questions 19–24

During each of the fall, winter, spring, and summer seasons of one year, Nikki and Otto each participate in exactly one of the following five sports: hockey, kayaking, mountaineering, running, and volleyball.

Each child participates in exactly four different sports during the year.
In the fall, each child participates in mountaineering, running, or volleyball.
In the winter, each child participates in hockey or volleyball.
In the spring, each child participates in kayaking, mountaineering, running, or volleyball.
In the summer, each child participates in kayaking, mountaineering, or volleyball.
Nikki and Otto do not participate in the same sport during the same season.
Otto's summer sport is volleyball.

19. Which one of the following statements must be true?

(A) Nikki's fall sport is running.
(B) Nikki's winter sport is volleyball.
(C) Nikki's spring sport is mountaineering.
(D) Otto's fall sport is mountaineering.
(E) Otto's spring sport is kayaking.

20. It CANNOT be true that both Nikki and Otto participate during the year in which one of the following sports?

(A) hockey
(B) kayaking
(C) mountaineering
(D) running
(E) volleyball

21. If Nikki's fall sport is running, then which one of the following statements must be true?

(A) Nikki's spring sport is kayaking.
(B) Nikki's summer sport is mountaineering.
(C) Otto's fall sport is mountaineering.
(D) Otto's spring sport is kayaking.
(E) Otto's spring sport is running.

22. Which one of the following statements could be true?

(A) Nikki's fall sport is neither mountaineering nor running.
(B) Nikki's spring sport is neither mountaineering nor running.
(C) Nikki's summer sport is neither kayaking nor mountaineering.
(D) Otto's fall sport is neither mountaineering nor running.
(E) Otto's spring sport is neither kayaking, nor mountaineering, nor running.

23. If Otto does not run during the year, then which one of the following statements must be false?

(A) Nikki's fall sport is running.
(B) Nikki's spring sport is running.
(C) Nikki's summer sport is kayaking.
(D) Otto's fall sport is mountaineering.
(E) Otto's spring sport is kayaking.

24. Which one of the following statements could be true?

(A) Nikki's fall sport is mountaineering and Otto's spring sport is runnning.
(B) Nikki's spring sport is running and her summer sport is mountaineering.
(C) Nikki's spring sport is mountaineering and Otto's fall sport is mountaineering.
(D) Nikki's spring sport is running and Otto's fall sport is mountaineering.
(E) Nikki's summer sport is mountaineering and Otto's spring sport is mountaineering.

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.