Chapter

16   MASTERING LOGICAL REASONING

INSTRUCTIONS

❏ Directions for answering the questions are given before each group of questions. Read these directions carefully and answer the questions by darkening the appropriate circles Sheet. Each question has only one correct answer.

❏ All questions carry three marks each. Each wrong answer will attract a penalty of one mark.

❏ Do your rough work only on the Test Booklet and NOT on the Answer Sheet.

Directions for questions 1 to 4: *Read the information given below and solve the questions based on it.*

Six products – U, V, W, X, Y and Z – are to be placed in the display window of a vending machine with six compartments, numbered 1 through 6 from left to right. The products must be placed in the window, one product in each compartment, according to the following conditions:

 U cannot be immediately to the left or immediately to the right of V,
 W must be immediately to the left of X,
 Z cannot be in compartment 6.

1. Which of the following products CANNOT be placed in compartment 1?
 (a) U   (b) V
 (c) W   (d) X

2. If X is placed in compartment 3, W must be placed in compartment
 (a) 1   (b) 2
 (c) 4   (d) 5

3. If U is placed in compartment 5, which of the following products must be placed in compartment 6?
   (a) V   (b) W
   (c) X   (d) Y

4. If Z is placed in compartment 3, immediately to the right of X, which of the following products must be placed in compartment 5?
   (a) Y   (b) V
   (c) W   (d) X

Directions for questions 5 to 8: *Read the information given below and solve the questions based on it.*

Some people – Tomas, Nadine, Pavel, Marta, Rachel, Fred, and Kurt – are planning to travel down a river on two rafts. The group will be assigned to the rafts according to the following conditions:
   Tomas must be assigned to the same raft as Rachel,
   Fred cannot be on the same raft as Pavel unless Marta is also on that raft,
   The maximum number of persons on each raft is four,
   Neither Nadine nor Pavel can be assigned to the same raft as Kurt.

5. If Fred is assigned to the same raft as Nadine, which of the following must be true?
   (a) Kurt is assigned to the other raft.
   (b) Marta is assigned to the other raft.
   (c) Pavel is assigned to the other raft.
   (d) Rachel is assigned to the same raft as Fred and Nadine.

6. If Rachel is assigned to the same raft as Pavel, which of the following must be true?
   (a) Kurt is assigned to the same raft as Rachel and Pavel.
   (b) Nadine is assigned to the same raft as Kurt.
   (c) Nadine is assigned to the raft other than the one to which Pavel is assigned.
   (d) Rachel and Pavel are assigned to the raft carrying four people.

7. If Kurt is assigned to the same raft as Marta, which of the following must be true?
   (a) Fred is assigned to the same raft as Nadine.
   (b) Fred is assigned to the same raft as Tomas.
   (c) Nadine is assigned to the same raft as Pavel.
   (d) Nadine is assigned to the same raft as Kurt and Marta.

8. If Rachel is assigned to the same raft as Fred, which of the following is a complete and accurate list of the people who must then be assigned to the other raft?
   (a) Fred, Pavel   (b) Marta, Nadine, Pavel
   (c) Marta, Tomas   (d) Kurt, Marta, Nadine

Directions for questions 9 to 14: *Read the information given below and solve the questions based on it.*

A flat wilderness area has four widely separated shelters – F, G, W, and X – that are connected by exactly four straight trails – Q, R, S, and T – that are equal to each other in length and connect the shelters in the following ways:
   Q connects F and W only.
   R connects G and W only.
   S connects F and G only.
   T connects G and X only.
   The shelters are at the ends of the trails.

9. Which of the following is the order in which a hiker, starting with F, using only trails and using no trail more than once, must reach the other shelters?
    (a) G, W, X   (b) W, G, X
    (c) W, X, G   (d) X, W, G

10. If a hiker is at X and wants to reach F by a sequence of trails no longer than necessary, there are how many trail sequences of minimal length from which to choose?
    (a) One   (b) Two
    (c) Three   (d) Four

11. If a hiker restricts herself to the trails, any of the following is a possible sequence in which full lengths of trails are hiked EXCEPT
    (a) Q, S, R, T, S   (b) R, Q, S, R, Q
    (c) S, T, T, R, Q   (d) T, R, R, T, T

12. If a hiker walks the full length of each trail exactly once, which of the following lists all those shelters and only those shelters at which the hiker must be exactly twice?
    (a) G   (b) F and G
    (c) G and W   (d) G and X

13. If by taking shortcuts that stray from the trails, a hiker could travel from W to X over a shorter distance than the shortest distance between W and X by trail alone, which of the following must be true?
    (a) The shortest distance by trail alone from F to X is less than the shortest distance by trail alone from W to X.
    (b) The shortest sequence of trails between F and X is the shortest distance between F and X.
    (c) The route composed of R and T is not a straight line.
    (d) R meets T at a right angle.

14. If the straight-line distance between F and X is the same as the straight-line distance between W and X, which of the following can result if new straight trails are added between F and X and between W and X?
    (a) The shortest distance by trail between any shelter and any other shelter is the same.
    (b) The number of trails re uired for the shortest possible hike by trail between any shelter and any other shelter is one.
    (c) The shortest distance by trail between F and X is less than the shortest distance between W and X.
    (d) A hiker must travel fewer trails to travel the shortest distance between F and X than to travel the shortest distance between F and G.

Directions for questions 15 to 18: *Read the information given below and solve the questions based on it.*

A contractor will build five houses in a certain town on a street that currently has no houses on it. The contractor will select from seven different models of houses – T, U, V, W, X, Y, and Z. The town's planning board has placed the following restrictions on the contractor:
    No model can be selected for more than one house,
    Either model W must be selected or model Z must be selected, but both cannot be selected,
    If model Y is selected, then model V must also be selected,
    If model U is selected, then model W cannot be selected.

15. If model U is one of the models selected for the street, then which of the following models must also be selected?
(a) T
(b) W
(c) X
(d) Z

16. If T, U, and X are three of the models selected for the street, then which of the following must be the other two models selected?
(a) V and W
(b) V and Y
(c) V and Z
(d) W and Y

17. Which of the following is an acceptable combination of models that can be selected for the street?
(a) V, W, X, Y, Z
(b) T, U, X, Y, Z
(c) T, V, X, Y, Z
(d) U, V, W, X, Y

18. If the model Z is one model not selected for the street, then the other model NOT selected must be which of the following?
(a) T
(b) U
(c) V
(d) W

Directions for questions 19 to 22: *Read the information given below and solve the questions based on it.*

The owner of a computer store is planning a window display of five products. Three are to be hardware items selected from K, L, M, N, and O, and two are to be software manuals selected from R, S, T, and U. The display items are to be selected according to the following conditions:

    If K is displayed, U must be displayed.
    M cannot be displayed unless both L and R also displayed.
    If N is displayed, O must be displayed, and if O is displayed, N must be displayed.
    If S is displayed, neither T nor U can be displayed.

19. Which of the following is an acceptable display?
(a) K, L, M, R, U
(b) K, M, N, O, R
(c) L, M, O, R, S
(d) M, N, O, T, U

20. If K and T are the first two display items to be selected, how many acceptable groups of items are there would complete the display?
(a) 1
(b) 2
(c) 3
(d) 4

21. If T and U are displayed, which of the following must also be displayed?
(a) R
(b) K
(c) M
(d) N

22. If N and O are not displayed, all of the following must be displayed EXCEPT
(a) K
(b) M
(c) R
(d) T

ANSWER KEYS

1. (d)	**2.** (b)	**3.** (d)	**4.** (a)	**5.** (a)	**6.** (d)	**7.** (c)
8. (b)	**9.** (b)	**10.** (a)	**11.** (a)	**12.** (a)	**13.** (c)	**14.** (b)
15. (d)	**16.** (c)	**17.** (c)	**18.** (b)	**19.** (a)	**20.** (a)	**21.** (d)
22. (d)						

1. Following diagram can be drawn:

A)
U	Z	V	W	X	Y
1	2	3	4	5	6

B)
V	Z	U	W	X	Y
1	2	3	4	5	6

C)
W	X	V	Z	U	Y
1	2	3	4	5	6

D)
X	W✗				
1	2	3	4	5	6

Here option (d) is not true according to the conditions given that is W is immediate left of X which is violating. Whereas option (a), (b), (c) are all satisfying the conditions given. Hence the answer is option (d).

2. Following diagram can be drawn:

	W	X			
1	2	3	4	5	6

The answer is option B that is in 2nd compartment W must be placed according to the given condition – W is immediate left of X. Hence the answer is option (b).

3. Following diagram can be drawn:

A)
				U	V✗
1	2	3	4	5	6

B)
				U	W✗
1	2	3	4	5	6

C)
				U	X✗
1	2	3	4	5	6

D)
W	X	V	Z	U	Y
1	2	3	4	5	6

According to the conditions given, we can see option (d) follows the conditions. Options (a), (b), (c) are not true as they are violating the conditions given. Hence the answer is option **(d)**.

4. Following diagram can be drawn:

Here Y must be place in compartment 5 if Z is placed in compartment 3, immediately to the right of X which is option (a). If take option (b), V cannot be in compartment 5 as it is given that U cannot be immediately to the left or immediately to the right of V. Options (c) and (d) are not possible at all. Hence the answer is option (a).

5. It is given in the condition that **neither Nadine nor Pavel can be assigned to the same raft as Kurt,** so option (a) is true. Whereas option (b) is not true as Marta is not related to Nadine here at all, similarly options (c) and (d) don't have a connection with Nadine. Hence the answer is option (a).

6. The answer is option (d) is true whereas option (a) is not true as it is violating the condition given **that Kurt cant assigned the raft to neither Naple nor Pavel** also option (b) is not true with the same condition and option (c) is again not matching with the conditions given. Hence the answer is option (d).

7. Here options (a) and (d) are not true as they are violating the same condition that **Kurt cant assigned the raft to neither Naple nor Pavel.** Option (b) is also not true as it is given that **Tomas must be assigned to the same raft as Rachel** which is violating. Hence the answer is option (c).

8. Here option (a) cannot come to the list of other raft as **Fred is already in one list**. Option (c) is also not true as it is given that **Tomas must be assigned to the same raft as Rachel** which is violating the condition. Also option (d) is not true because it is given that **Nadine and Kurt cannot be on same raft**. In option (b) there seems to be accurate list of people without violating any condition. Hence the answer is option (b).

9. According to the given question:
Here shelter F starting from trail Q reaches to shelter X in a sequence – W, G, X using each trail only once that trails Q, R, S, T and sequence found to be in option (b) Hence the answer is option (b).

10. Here hiker is at X that is in trail T and want to reach shelter F in minimum length, then there is trail S which is connected with shelter F a point where hiker want to reach so there is only one length which is minimum. Hence the answer is option (a).

11. The answer is option (a) as it is not following the sequence in which full lengths of trails are hiked as per the given scenario. Other options are in the sequence. Hence the answer is option (a).

12. The answer is option (a) as when a hiker starts walking from Q to trail T he reaches twice with the shelter G as per given in the rule. Hence the answer is option (a).

13. Here option (a) is not true because it is violating the conditions of trails and shelters, similarly option (b) is not true and option (d) also violating the given scenario. In option (c) as the distance between W and X is to find the route composed of R and T is there. Hence the answer is option (c).

14. According to the given question option (b) is the answer because number of trails required for the shortest possible hike by trail between any shelter and any other shelter is one. Option (a) is not true as distance is not same. Similarly in options (c) and (d) are not matching with the given question. Hence the answer is option (b).

15. The answer is option (d) that is Z as it is given in the rule that is W is selected than Z cannot and vice-versa, also given that Y and V are selected together and if U is selected then W cannot selected. So option (b) cannot be the answer as per the rule, and options (a) and (c) are not mentioned in the rule. Hence the answer is option (d).

16. Option (a) is not the answer as it is given in question that T, U, X are three models; so from V and W, model W cannot be selected as model U is there and it is given in rule that if U is selected then W cannot be selected. Same is the case in option (d) In option (b), model V and Y cannot be the answer as it is given that if V is selected then, Y must also be selected. Hence the answer is option (c).

17. In option (a), model W and model Z both are selected together which is not as per the rule given. Option (b) also violates the rule as model V and Y should be selected together so here only model Y is present and in option (d) again if model U is selected then model W cannot be selected. Hence the answer is option (c).

18. In option (b), model U cannot be selected because if model Z is not selected then model W must be selected as per the given rule and if model W is selected then model U cannot be selected as it is also given in the rule that if model U is selected then model W cannot selected. Hence the answer is option (b).

19. An acceptable display is K, L, M, R, U that is option (a) as it is satisfying all the conditions. Option (b) is incorrect, as it is violating the condition – If K is displayed, U must be displayed. Similarly, options (c) and (d) are violating the conditions. Hence the answer is option (a).

20. Only one group is acceptable to complete the display, which is given in option (a) As it is given that – If K and T are the first two display items to be selected, that is K is from hardware and T is from software manual, so now 2 from hardware is left and 1 from software manual. Hence the answer is option (a).

21. Since, T and U displayed are from software manuals, so option (a), cannot be true as it is given that only two are selected from software manuals. Option (b) is incorrect as it is given in the condition that if K is displayed, U must also be displayed, not vice-versa. Similarly, option (c) is incorrect as it is stated that – M cannot be displayed unless both L and R also displayed. So, option (d) is left, which is satisfying the conditions. Hence the answer is option (d).

22. As per given conditions, T cannot be displayed if N and O are not displayed. Options (a), (b), and (c) must be displayed. Hence the answer is option (d).

INSTRUCTIONS

❏ Directions for answering the questions are given before each group of questions. Read these directions carefully and answer the questions by darkening the appropriate circles Sheet. Each question has only one correct answer.

❏ All questions carry three marks each. Each wrong answer will attract a penalty of one mark.

❏ Do your rough work only on the Test Booklet and NOT on the Answer Sheet.

Directions for questions 1 to 6: *Read the information given below and solve the questions based on it.*

Three children live at houses with different colored doors. Following are the details of the children:

    Child Name – Govind, Jai, Sama   Door – Blue, Green, Red

    House Numbers – 1, 2, 3   Road – Bridge Street, Cherry Road, Sandy Lane

Sama's house No. is 1 lower than Jai's. Govind does not live at House No.1, but does not have a green door. One child lives at No.2 at Cherry Road. House No.1 has a red door, but is not on Sandy lane.

1. Who lives at Bridge street?
   (a) Govind   (b) Jai
   (c) Sama   (d) More than one answer is possible

2. Which of the following is correctly matched door color and house number?
   (a) Blue – House No. 1
   (b) Blue – House No. 2
   (c) Red – House No. 1
   (d) Red – House No. 2

3. Which of the following is the correct combination for Govind?
   (a) Govind – Green – 2 – Cherry Road
   (b) Govind – Green – 3 – Sandy Lane
   (c) Govind – Blue – 2 – Cherry Road
   (d) Govind –Blue– 3 – Sandy Lane

4. For how many children, is it possible to exactly determine the house number, road and color of road?
   (a) 0   (b) 1   (c) 2   (d) 3

5. The child who lives at Cherry Road has the following combination of door color and house number?
   (a) Green color – House No. 3
   (b) Blue color – House No. 2
   (c) Red color – House No. 1
   (d) None of these

6. What is the color of the door of Jai's house?
   (a) Red   (b) Green
   (c) Blue   (d) Either Blue or Red

Directions for questions 7 to 12: *Read the information given below and solve the questions based on it.*

Chef Sudhir is preparing orders of toast for three customers A, B and C.

Assume that all the three customers ordered at exactly the same time, and the time to place bread in and remove toast from the toaster is negligible.

Sudhir has two toasters that can each toast 2 pieces of bread at the same time, and 1 knife to apply both butter and jam.

(i)   It takes 1 minute to lightly toast 2 pieces of bread.
(ii) It takes 1 minute 30 seconds to moderately toast 2 pieces of bread.
(iii) It takes 2 minutes to darkly toast 2 pieces of bread.
(iv) It takes 10 seconds to apply butter to a piece of toast.
(v)   It takes 15 seconds to apply jam to a piece of toast.

Following are the orders:

Customer A wants 4 pieces of toast, moderately toasted, with butter on each piece.

Customer B wants 2 pieces of toast, lightly toasted, with butter and jam on each piece.

Customer C wants 3 pieces of toast, darkly toasted, with butter on 1 piece, nothing on the others.

Waiting time for any customer is the total time taken by Sudhir to serve that particular customer. For example, if A had to wait for 2 minutes, and after serving A, B is served in another 1 minute, then total waiting time for B will be 3 minutes.

Overall objective of Sudhir is to minimize the total combined waiting time. Total combined waiting time = Individual waiting time of A + individual waiting time of B + Individual waiting time of C.

7. Who will be served first?
    (a) A   (b) B
    (c) C   (d) A or B or C

8. Who will be served second?
    (a) A   (b) B
    (c) C   (d) A or B or C

9. Who will be served third?
    (a) A   (b) B
    (c) C   (d) A or B or C

10. What is the combined total waiting time?
    (a) 9 minutes 20 seconds
    (b) 8 minutes 55 seconds
    (c) 8 minutes 40 seconds
    (d) None of these

11. What is the individual waiting time of A?
    (a) 4 minutes 20 seconds
    (b) 4 minutes 10 seconds
    (c) 4 minutes 40 seconds
    (d) None of these

12. What is the waiting time of C?
    (a) 2 minutes 10 seconds
    (b) 4 minutes 20 seconds
    (c) 2 minutes 30 seconds
    (d) None of these

Directions for questions 13 to 16: *Go through the information given below and solve the questions based on it.*

You are the Quality Control manager at a restaurant. Go through the case facts given below and solve the questions based on it:

Restaurant produces chicken nugget box (1,000 boxes at a time in a batch). Restaurant has to ensure that it does not supply undercooked nuggets (known as defective)   to the customers. If a customer receives a defective nugget box, company has to pay a penalty of ₹150 per nugget box. To check the level of preparedness of nuggets, any of the two tests can be used:

Test 1		Test 2	
Cost	₹6 per nugget box	Cost	₹9 per nugget box
Detection Rate	80%	Detection Rate	100%

Restaurant can re-cook undercooked nuggets at a cost of ₹75 per nugget box. This box can be now sold to customer as it is now certainly properly cooked. All the boxes which are detected as defective must be re-cooked and after that, these boxes are properly cooked now.

Let 'x' be the number of defective nugget boxes per batch.

13. Manager should not use any quality control test, if it is expected that
    (a) x < 100   (b) 100 < x < 200
    (c) x > 200   (d) None of these

14. If 200 < x < 400, then
    (a) You should use Test 1
    (b) You should use Test 2
    (c) You can use Test 1 or Test 2
    (d) None of these

15. If x = 1000, you should use
    (a) Test 2   (b) Test 1 and Test 2
    (c) Test 1 or No test (d) None

16. Company should be indifferent between Test 1 and No Test if it finds that the number of defective boxes is equal to
    (a) 50   (b) 100
    (c) 200   (d) Not possible

Directions for questions 17 to 19: *Answer the questions based on the following information.*

Sixteen teams have been invited to participate in the ABC Gold Cup cricket tournament. The tournament is conducted in two stages. In the first stage, the teams are divided into two groups. Each group consists of eight teams, with each team playing every other team in its group exactly once. At the end of the first stage, the top four teams from each group advance to the second stage while the rest are eliminated. The second stage comprises of several rounds. A round involves one match for each team. The winner of a match in a round advances to the next round, while the loser is eliminated. The team that remains undefeated in the second stage is declared the winner and claims the Gold Cup.

The tournament rules are such that each match results in a winner and a loser with no possibility of a tie. In the first stage, a team earns one point for each win and no points for a loss. At the end of the first stage, teams in each group are ranked on the

basis of total points to determine the qualifiers advancing to the next stage. Ties are resolved by a series of complex tie-breaking rules so that exactly four teams from each group advance to the next stage.

17. What is the total number of matches played in the tournament?
    (a) 28   (b) 55
    (c) 63   (d) 35

18. The minimum number of wins needed for team in the first stage to guarantee its advancement to the next stage is
    (a) 5   (b) 6
    (c) 7   (d) 4

19. What is the number of rounds in the second stage of the tournament?
    (a) 1   (b) 2
    (c) 3   (d) 4

20. A shipping clerk has five boxes of different but unknown weights each weighing less than 100 kg. The clerk weighs the boxes in pairs. The pair wise weights obtained are 110, 112, 113, 114, 115, 116, 117, 118, 120 and 121 kg. What is the weight of the heaviest box?
    (a) 60 kg   (b) 62 kg
    (c) 64 kg   (d) Cannot be determined

ANSWER KEYS

1. (c)	**2.** (b)	**3.** (b)	**4.** (d)	**5.** (b)	**6.** (c)	**7.** (c)
8. (b)	**9.** (a)	**10.** (b)	**11.** (b)	**12.** (a)	**13.** (a)	**14.** (b)
15. (a)	**16.** (b)	**17.** (c)	**18.** (b)	**19.** (c)	**20.** (b)	

HINTS AND EXPLANATIONS

1 to 6

Following is the arrangement:

Child	Color of Door	House Number	Road
Govind	Green	3	Sandy lane
Jai	Blue	2	Cherry Road
Sama	Red	1	Bridge Street

1. Sama lives as Bridge Street. Hence option (c) is the answer.

2. House number 2 has blue colored door. Hence option (b) is the answer.

3. It can be seen from the table that option (b) is the answer.

4. As obvious from the above table, it can be determined for all three of them. Hence option (d) is the answer.

5. Child who lives at Cherry road (Jai) has his house number 2 and color of door is blue. Hence option (b) is the answer.

6. Jai's house color of door is blue. Hence option (c) is the answer.

Total Combined waiting time = 8 minutes 55 seconds
Customer (A) will have to wait 4 minutes 10 seconds; Customer (B) will wait 2 minutes 35 seconds; and customer (C) will wait 2 minutes 10 seconds. C's three slices plus one of B's will toast first. B's first slice will have butter and jam applied while the second slice of B's order is toasting. After 2 minutes, A's toast will begin. C's order will be buttered in 10 more seconds, for a total of 2 minutes 10 seconds. Then, B's last slice will be buttered and jam applied, for a total waiting time of 2 minutes 35 seconds. After A's order is toasted and 1 slice buttered, 4 minutes 10 seconds will have elapsed.

7. Customer C will be served 1st after 2 minutes 10 seconds. Hence option (c) is the answer.

8. Customer B will be served 2nd. Hence option (b) is the answer.

9. Customer A will be served 3rd. Hence option (a) is the answer.

10. Combined total waiting time = Waiting time of A + Waiting time of B + Waiting time of C = 4:10 + 2:35 + 2:10 = 8 minutes 55 seconds. Hence option (b) is the answer.

11. As obvious from the explanation above, A will wait for 4 minutes 10 seconds. Hence option (b) is the answer.

12. As obvious from the explanation above, C will wait for 2 minutes 10 seconds. Hence option (a) is the answer.

Total cost = Cost of Testing + Re-cook charge + Penalty
It can be seen that if the number of defective nugget boxes per batch is very low, for example, 10, then it is better to pay the penalty on this, than to use any test.

13. Total cost = Cost of Testing + Re-cook charge + Penalty
Using Test 1, total cost of testing = ₹6 × 1000 = ₹6000
Using options, at x = 100, Cost of Test 1 = Penalty paid for x = 100.
Using Test 1, Detection = 80 % of 100 = 80. These 80 will be reworked upon and for remaining 20, company will pay penalty.
Total cost = Cost of Testing + Re-cook charge + Penalty = ₹6000 + 80 × ₹75 + 20 × ₹150 = ₹15,000.
For x = 100, penalty = ₹150 × 100 = ₹15000. Hence option (a) is the answer.

14. Check for x = 300.
Total cost using Test 1:
Cost of testing = ₹6 × 1000 = ₹6000
Out of total defective 300 boxes, 80% will be detected. So, total detected boxes = 80% of 300 = 240 boxes. These 240 boxes will be reworked upon and remaining 60 boxes will go undetected. As per the rule, restaurant will have to pay penalty on these 60 boxes.
Re- cook charges = ₹75 × 240 = ₹18000
Penalty = ₹150 × 60 = ₹9000
So, total cost using Test 1 = Cost of Testing + Re-cook charge + Penalty = ₹6000 + ₹18000 + ₹9000 = ₹33,000.
Total cost using Test 2:
Cost of testing = ₹9 × 1000 = ₹9000

Out of total defective 300 boxes, 100% will be detected. So, total detected boxes = 100% of 300 = 300 boxes. These 300 boxes will be reworked upon.
Re-cook charges = ₹75 × 300 = ₹22500
So, total cost using Test 2 = Cost of Testing + Re-cook charge + Penalty
= ₹9000 + ₹22500 + ₹0 = ₹31,500.
It can be seen that Total cost of Test 1 < Total cost of Test 2. Hence test 2 should be used. Hence option (b) is the answer.

15. Option (a) is the answer.

16. Using solution to Q(13), Penalty for x = 100 is equal to Total cost of Test 1 for x = 100.
Hence answer is – No test or Test 1 if x = 100.
Hence option (b) is the answer.

17 to 19

17. There shall be 8 teams in each group. Each team in a group shall be playing with every other team. Hence, total number of matches shall be $\left(\dfrac{7 \times 8}{2}\right)$ = 28 in one group. Hence, in both the groups, there shall be 56 matches. This is for the first stage. Thereafter, there are 8 teams in knockout rounds from which one winner emerges, or 7 losers are identified. Hence, 7 more matches, i.e. in all 63 matches. Hence option (c) is the answer.

18. Under extreme conditions, the following can be the maximum number of matches won.

Teams	A	B	C	D	E	F	G	H
A	NA	√	√	√	√	√	×	×
B	×	NA	√	√	√	√	√	×
C	×	×	NA	√	√	√	√	√
D	×	×	×	NA				
E	×	×	×		NA			
F	×	×	×			NA		
G	√	×	×	√	√	√	NA	√
H	√	√	×	√	√	√	×	NA

In the above table, √ represents win and × represents loss.
From the table, A, B, C, G and H can win five matches each. Hence, we cannot decide that which team will qualify for the second round. Therefore, the minimum number of wins that can assure a place in the second stage is 6. Hence option (b) is the answer.

19. There are 8 teams. Hence, there would be 7 matches in 3 rounds. In general, any knockout or elimination format of tournament will have (n-1) matches if there are n teams. Hence option (c) is the answer.

20. 60 cannot be the answer because then to arrive at a total of 121, the other box will have to weigh 61 kg. 64 is wrong too, because then to add up to 121, the other weight will have to be 57 and to make up to a total of 120, the next box shall have a weight 63 which obviously makes the maximum possible total as 64 + 63 = 127. 62 is the correct answer because the other boxes shall be 59, 54, 56. These will give all the totals given above. Hence option (b) is the answer.

INSTRUCTIONS

❏ Directions for answering the questions are given before each group of questions. Read these directions carefully and answer the questions by darkening the appropriate circles Sheet. Each question has only one correct answer.

❏ All questions carry three marks each. Each wrong answer will attract a penalty of one mark.

1. Three children won prizes in the Tech India Quiz contest. They are from three schools: Lancer, Columbus and Leelavati, which are located in different states. One of the children is named Binod. Lancer school's contestant did not come first. Leelavati school's contestant's name is Rahman. Columbus school is not located in Andhra Pradesh. The contestant from Maharashtra got third place and is not from Leelavati School. The contestant from Karnataka did not secure first position. Columbus school's contestant's name is not Badal.

   Which of the following statements is TRUE?
   (a) 1st prize: Rahman (Leelavati), 2nd prize: Binod (Columbus), 3rd prize: Badal (Lancer)
   (b) 1st prize: Binod (Columbus), 2nd prize: Rahman (Leelavati), 3rd prize: Badal (Lancer)
   (c) 1st prize: Rahman (Lancer), 2nd prize: Badal (Columbus), 3rd prize: Binod (Leelavati)
   (d) 1st prize: Binod (Columbus), 2nd prize: Badal (Lancer), 3rd prize: Rahman (Leelavati)

2. Mother Dairy sells milk packets in boxes of different sizes to its vendors. The vendors are charged ₹20 per packet up to 2000 packets in a box. Additions can be made only in a lot size of 200 packets. Each addition of one lot to the box results in a discount of one rupee an all the packets in the box. What should be the maximum size of the box that would maximize the revenue per box for Mother Dairy?
   (a) 2400 packets   (b) 3000 packets
   (c) 4000 packets   (d) None of these

3. All employees have to pass through three consecutive entrance doors to enter into the office and one security guard is deployed at each door. These security guards report to the manager about those who come to office after 10 AM. Ms Rani is an employee of this office and came late on the annual day. In order to avoid report to the manager she had to pay each security guard half of the money she had in her purse and 2 rupees more besides. She found only one rupee with her at the end. How much money Ms Rani had before entering the office on the annual day?
   (a) ₹40   (b) ₹36
   (c) ₹25   (d) ₹42

Directions for questions 4 to 5: *Answer the questions based on the following information. Director of an institute wants to distribute teaching assignments of HRM, Psychology, Development Studies, Trade policy and Finance to five of six newly appointed faculty members. Prof. Fotedar does not want any assignment if Prof. Das gets one of the five. Prof. Chaudhury desires either HRM or Finance*

or no assignment. Prof. Banik opines that if Prof. Das gets either Psychology or Trade Policy then she must get the other one. Prof. Eswar insists on an assignment if Prof. Acharya gets one.

4. Which of the following is valid faculty – assignment combination if all the faculty preferences are considered?
   (a) Prof. Acharya – HRM, Prof. Banik – Psychology, Prof. Chaudhury – Development studies, Prof. Das – Trade Policy, Prof. Eswar – Finance
   (b) Prof. Chaudhury – HRM, Prof. Das – Psychology, Prof. Acharya – Development studies, Prof. Banik – Trade Policy, Prof. Eswar – Finance
   (c) Prof. Acharya – HRM, Prof. Banik – Psychology, Prof. Eswar – Development studies, Prof. Das – Trade Policy, Prof. Fotedar – Finance
   (d) Prof. Banik – HRM, Prof. Fotedar – Psychology, Prof. Eswar – Development studies, Prof. Chaudhuri – Trade Policy, Prof. Acharya – Finance

5. If Prof. Acharya gets HRM and Prof. Chaudhury gets Finance, then which of the following is not a correct faculty-assignment combination assuming all faculty preferences are considered?
   (a) Prof. Das – Development Studies, Prof. Banik – Trade Policy
   (b) Prof. Fotedar – Development Studies, Prof. Banik – Trade Policy
   (c) Prof. Banik – Development Studies, Prof. Eswar – Trade Policy
   (d) Prof. Banik – Development Studies, Prof. Das – Trade Policy

Directions for questions 6 to 8: *Answer the questions based on the following information. Five women decided to go for shopping to South Extension, New Delhi. They arrived at the designated meeting place in the following order: 1. Aradhana, 2. Chandrima, 3. Deepika, 4. Heena and 5. Sumitra. Each of them spent at least ₹1000. The woman who spent ₹2234 arrived before the woman who spent ₹1193. One of them spent ₹1340 and she was not Deepika. One woman spent ₹1378 more than Chandrima. One of them spent ₹2517 and she was not Aradhana. Heena spent more than Deepika. Sumitra spent the largest amount and Chandrima the smallest.*

6. What was the amount spent by Heena?
   (a) ₹1193   (b) ₹1340
   (c) ₹2234   (d) ₹2517

7. Which of the following amount is spent by one of the women?
   (a) ₹1139   (b) ₹1378
   (c) ₹2571   (d) ₹2518

8. The lady who spent ₹1193 is:
   (a) Aradhana   (b) Chandrima
   (c) Deepika   (d) Heena

Directions for questions 9 to 11: *Answer the questions based on the following information. In a motor race competition certain rules are given for the participants to follow. To control direction and speed of the motorists, guards are placed at different signal points with caps of different colour. Guard with red cap indicates the direction of participant's movement and guards with green cap indicates the speed of the participant's movement. At any signal point presence of three guards, two guards and one guard with red cap means the participant must stop, turn left and turn right respectively. Signal points with three guards, two guards and one guard with green cap means the participants must move at 10, 4 and 2 km/hour respectively. Kartikay,*

one of the participants, starts at a point where his car was heading towards north and he encountered signals as follows: at start point one guard with green cap; after half an hour two guards with red cap and two guards with green cap at first signal; after fifteen minutes one guard with red cap at second signal; after half an hour one guard with red cap and three guards with green caps at third signal; after 24 minutes two guard with red cap and two guards with green cap at fourth signal; after 15 minutes three guard with red cap at fifth signal. (Time mentioned in each case is applicable after crossing the previous signal).

9. Total distance travelled by Kartikay from starting point till last signal is:
  (a) 9 km.
  (b) 10 km.
  (c) 8 km.
  (d) 12 km.

10. What would be the final position of Kartikay if one guard with red cap and two guards with green caps were placed at the first signal point after the starting point?
  (a) 3.0 km to the west and 2.0 km to the south
  (b) 3.0 km to the west and 4.0 km to the north
  (c) 5.0 km to the east and 4.0 km to the north
  (d) 2.0 km to the west and 4.0 km to the south

11. If at the starting point Kartikay was heading towards south what would be his final position?
  (a) 3.0 km to the east and 4.0 km to the south
  (b) 5.0 km to the east and 4.0 km to the south
  (c) 3.0 km to the west and 4.0 km to the south
  (d) 5.0 km to the west and 2.0 km to the north

Directions for questions 12 to 15: *Answer the questions based on the following information. Mr Mansingh has five sons – Arun, Mahi, Rohit, Nilesh and Saurav, and three daughters – Tamanna, Kuntala and Janaki. Three sons of Mr Mansingh were born first followed by two daughters. Saurav is the eldest child and Janki is the youngest. Three of the children are studying at Trinity School and three are studying at St. Stefan. Tamanna and Rohit study at St. Stefan school. Kuntala, the eldest daughter, plays chess. Mansorover school offers cricket only, while Trinity school offers chess. Beside, these schools offer no other games. The children who are at Mansorover school have been born in succession. Mahi and Nilesh are cricketers while Arun plays football. Rohit who was born just before Janki, plays hockey.*

12. Arun is the _____ child of Mr Mansingh.
  (a) 2nd
  (b) 3rd
  (c) 6th
  (d) 5th

13. Saurav is a student of which school?
  (a) Trinity
  (b) St. Stefan
  (c) Mansorover
  (d) Cannot be determined

14. What game does Tamanna play?
  (a) Cricket
  (b) Hockey
  (c) Football
  (d) Cannot be determined

15. Which of the following pairs was not born in succession (ignore the order)?
  (a) Mahi and Nilesh
  (b) Kuntala and Arun
  (c) Rohit and Janki
  (d) Arun and Rohit

Directions for questions 16 to 20: *Read the information and solve the questions based on it.*

A museum curator must group nine paintings – F, G, H, J, K, L, M, N, and O – in twelve spaces numbered consecutively from 1-12. The paintings must be in three groups, each group representing a different century. The groups must be separated from each other by at least one unused wall space. Three of the paintings are from the eighteenth century, two from the nineteenth century, and four from the twentieth century.

    Unused wall spaces cannot occur within groups.
    G and J are paintings from different centuries.
    J, K, and L are all paintings from same century.
    Space number 5 is always empty.
    F and M are eighteenth-century paintings
    N is a nineteenth-century painting.

16. If the paintings are hung in reverse chronological order by century, the unused wall spaces could be
    (a) 1, 5, and 10   (b) 1, 6, and 10
    (c) 4, 7, and 8   (d) 5, 8, and 12

17. Which of the following is a space that CANNOT be occupied by a nineteenth-century painting?
    (a) Space 1   (b) Space 6
    (c) Space 8   (d) Space 11

18. If J hangs in space 11, which of the following is a possible arrangement for spaces 8 and 9?
    (a) F in 8 and M in 9 (b) K in 8 and G in 9
    (c) N in 8 and G in 9 (d) 8 unused and H in 9

19. If the twentieth-century paintings are hung in spaces 1-4, which of the following CANNOT be true?
    (a) Space 8 is unused
    (b) Space 9 is unused
    (c) N is hung in space 9
    (d) M is hung up in space 12

20. If the first five paintings, in numerical order of spaces, are F, O, M, N, G, which of the following must be true?
    (a) Either space 1 or space 4 is unused
    (b) Either space 7 or space 12 is unused
    (c) H hangs in space 11
    (d) Two unused spaces separate the eighteenth-century and nineteenth-century paintings

ANSWER KEYS						
1. (a)	**2.** (b)	**3.** (b)	**4.** (d)	**5.** (d)	**6.** (b)	**7.** (a)
8. (c)	**9.** (a)	**10.** (a)	**11.** (c)	**12.** (c)	**13.** (a)	**14.** (d)
15. (b)	**16.** (d)	**17.** (a)	**18.** (d)	**19.** (c)	**20.** (a)	

1.

Name	School	State
Rehman	Leelavati	Andhra Pradesh
Binod/Badal	Lancer/Columbous	Karnakata
Badal/Binod	Lancer/Columbous	Maharashtra

So, correct option is (a)

2. For 2000 packets the price is ₹20.
So, revenue = 2000 × 20
= ₹40,000
For 2200 packets the prices is ₹19.
For 2400 packets the prices is ₹18.
Calculating revenue in each case, we will get the maximum revenue for 3000 packets.

3. Money left to Ms. Rani
After 3rd door = ₹1
After 2nd (before 3rd) = ₹6
After 1st (before 2nd) = ₹16
Similarly, amount she was having in start is ₹36.
Option (b) is correct.

4. The faculty-assignment combination in option (d) do not violates any condition. Rest all option violates at least 1 condition.

5. If prof. Das gets psychology or trade policy then prof. Banik must get the other. So, if prof. Das got trade policy, then prof Banik must get psychology. So, the combination given in option (d) is not possible.

6 to 8

We know 4 exact values for amount spent which are ₹2234, ₹1193, ₹1340 & ₹2517. Further we know that 1 woman spent ₹1378 more than the chandrima who spent the smallest amount & we also know the smallest amount which can be spent is ₹1000.

So, the woman who spent ₹2517 must have spent ₹1378 more than Chandrima. So, amount spent by Chandrima is ₹1139.

Sumitra spent ₹2517. As Heena spent more than Deepika who did not spent ₹1340. So, the amount spent by Heena & Deepika are ₹1340 & ₹1193 respectively.

9. After 30 minutes Kartikay travelled 1 km & his position is (0, 1). For next 15 min the travelled 1 km & his position is (−1, 1). For next 30 min he travelled 2 km and his position is (−1, 3). For next 24 minutes, he travelled 4 km & his position is (3, 3). For next 15 min he travelled 1 km & his position is (3, 4).
Total distance travelled = 1 + 1 + 2 + 4 + 1
= 9 km
Option (a) is correct.

10 to 11

Can be solved like 9.

We can solve this question as tabular arrangement with 8 rows & 5 columns, where each row shows each child. The 5 columns show, order (eldest to youngest), name, gender, school & game.

It is given that 3 sons were born first & then 2 daughters. So, gender for 1 to 3 is male & for 4 & 5, female. Saurav & Janaki are eldest & youngest & Janaki is daughter. So, gender for 8th child must be female & gender for 6th & 7th children must be male. Kuntala is eldest daughter & she plays chess. She must be from Trinity school as Trinity school offers only chess So, she must be 4th child. Rohit was born just before Janaki & so he must be the 7th child. He plays hockey & his school is St. Stefan. The table will be as follows:
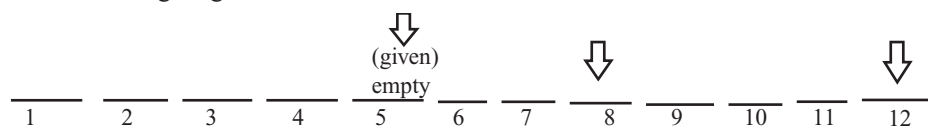
Order	Name	Gender	School	Game
1	Saurav	Male		
2		Male		
3		Male		
4	Kuntala	Female	Trinity	Chess
5		Female		
6		Male		
7	Rohit	Male	St. Stefan	Hockey
8	Janaki	Female		

Further, 3 children are studying in St. Stefan & 3 are studying in Trinity. So, remaining 2 must be studying in Mansorover. The children who are at Mansorover School have been born in succession. Mansorover school offers only cricket in games. Mahi & Nilesh are cricketers. So, the 2 children who are studying in Marsorover school must be Mahi & Nilesh who are both males & they must be 2nd & 3rd children of Mr. Mansingh. One of the 5 sons is Arun who plays football. So, Arun must be the 6th child & his school must be St. Stefan (as Trinity offers only chess as game). Tamanna, one of the 3 daughters, is studying in St. Stefan & she must be the 5th child. So, the school in which Saurav & Janaki are studying must be Trinity & so they must be playing chess (as Trinity offers only chess). The table will be as shown below:

Order	Name	Gender	School	Game
1	Saurav	Male	Trinity	Chess
2	Mahi/Nilesh	Male	Mansorover	Cricket
3	Nilesh/mahi	Male	Mansorover	Cricket
4	Kuntala	Female	Trinity	Chess
5	Tamanna	Female	St. Stefan	

6	Arun	Male	St. Stefan	Football
7	Rohit	Male	St. Stefan	Hockey
8	Janaki	Female	Trinity	Chess

12. Arun is the 6th child of Mr. Mansingh

13. Saurav is a student of Trinity school

14. The game which is played by Tamanna cannot be determined

15. Kuntala & Arun is 4th & 6th child of Mr. Mansingh. So, they are not in succession

16. Following diagram can be drawn:

```
                    ⇩                    ⇩                        ⇩
                 (given)
                 empty
___  ___  ___  ___  ___  ___  ___  ___  ___  ___  ___  ___
 1    2    3    4    5    6    7    8    9   10   11   12
```
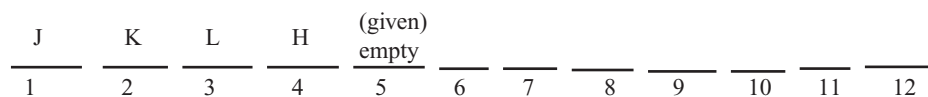
   Options A, B, C are not the answers because they cannot be used as unused walls as per the given condition that unused wall spaces cannot occur within groups. Hence the answer is option (d).

17. The answer is option A as the centuries are in chronological order so according to that eighteenth century should come at space 1. Hence the answer is option (a).

18. Following diagram can be drawn:

```
                              (given)
                              empty                empty   H    K    J    L
___  ___  ___  ___  ___  ___  ___  ___  ___  ___  ___  ___
 1    2    3    4    5    6    7    8    9   10   11   12
                                          _____/
                                            twentieth century
```
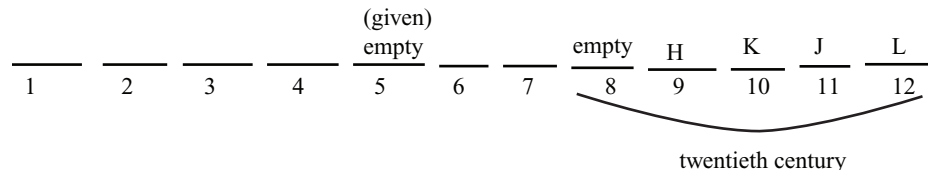
   According to the given rule J, K, L belong to same century and are at the end so we put it in twentieth century. Hence the answer is option (d).

19. Following diagram can be drawn:

```
 J    K    L    H   (given)
                    empty
___  ___  ___  ___  ___  ___  ___  ___  ___  ___  ___  ___
 1    2    3    4    5    6    7    8    9   10   11   12
```

   Here option is not true as N is in nineteenth century which is given so it should come in space 6, 7 or 8 not in 9. Other options are true. Hence the answer is option (c).

20. According to the conditions given, F, O, M belong to eighteenth century and N, G belong to nineteenth century. Hence the answer is option (a).

Directions for questions 1 to 6: *Read the following passage and solve the questions based on it.*

My brother Vinit while was planning to go home last year was confused about the clothes that he should carry with him. He had the following types of clothing: belts, hats, jackets, ties, vests, T-shirts and handkerchiefs. It was also known that he had with him several pieces of each of the seven types of clothing. Finally, he set up an algorithm to decide the clothes that he would be taking along with him.

 (i)   If he packed ties, then he did not pack handkerchiefs.
 (ii) If he packed belts, then he did not pack jackets.
(iii) If he packed belts, then he packed at least one handkerchief.
(iv) If he packed jackets, then he packed at least one vest.
 (v)   If he packed vests, then he packed at least one handkerchief.
(vi) If he packed handkerchiefs, then he packed at least two of them.

1. Which one of the following could be a complete list of the clothing that my brother packed?
   (a) One belt, one T-shirt, one vest, two handkerchiefs.
   (b) One belt, one tie, one T-shirt, three handkerchiefs.
   (c) Two belts, one ties, three T-shirts.
   (d) One jacket, one T-shirt, two vests and one handkerchief.

2. If Vinit did not pack any handkerchiefs, what was the maximum number of the different types of clothing that he could pack?
   (a) Two   (b) Three
   (c) Four   (d) Five

3. Which one of the following statements must be false?
   (a) Vinit packed exactly three items of clothing, one of which was a vest.
   (b) Vinit packed exactly four items of clothing, one of which was a hat.
   (c) Vinit packed exactly three items of clothing, one of which was handkerchief.
   (d) Vinit packed exactly three items of clothing, one of which was a belt.

4. If Vinit packed as many items of clothing as possible, then it must be true that he did not pack one of the following types of clothing.
   (a) Belts   (b) Hats
   (c) Ties   (d) Jackets

5. If Vinit packed at least one item, find out which one of the following are the minimum and the maximum numbers of the types of clothing that he could pack?
   (a) 1,4   (b) 1,5
   (c) 1,6   (d) 2,5

6. If Vinit did not pack any vests, then it could be true that he packed one or more
   (a) Ties and jackets
   (b) T-shirts and belts
   (c) Ties and belts
   (d) T-shirts and ties

Directions for questions 7 to 9: *Read the following passage and solve the questions based on it.*

The production, marketing, human resource, finance and management information system managers of a particular company meet for a round table meeting to discuss

the strategy of the company. Out of the five, three are men and the other two are women. The following restrictions apply to their seating arrangement:

(i) The two women will not be seated next to each other.
(ii) The production manager, a man, will always be seated as far as possible from the marketing manager.
(iii) The finance manager will always be seated next to a woman.

7. If the human resource manager is a man, which of the following is definitely not true?
   (a) The marketing manager is sitting in between the two women
   (b) The marketing manager is sitting in between two men
   (c) The finance manager is a man
   (d) The marketing manager is a woman

8. If the finance manager always has a woman to his right, in how many different arrangements can the marketing manager be a woman?
   (a) 2   (b) 3
   (c) 4   (d) 5

9. If the management information system manager is sitting just to the right of the production manager, which of the following statement(s) is/are definitely True?
   I. The marketing manager and the finance manager sit next to each other.
   II. The human resource manager has to be a woman.
   III. The management information system manager has to be a man.
   (a) I only   (b) I and II
   (c) I and III   (d) II and III

Directions for questions 10 to 14: *Read the following passage and solve the questions based on it.*

The Snehans Apartment Welfare Association offers three activities to its members skating, soft ball and steam bath. To avail all these facilities the association has made separate activity centres, one each for all the three activities. The following table gives the details pertaining to the number of different types of members, the capacity of each type of activity centre and the time that must be invested in the individual activities (if used):

	In Time	Number of Members	Skating	Soft ball	Steam Bath
Males	7.30 a.m.	200	90 minutes	75 minutes	20 minutes
Females	8.30 a.m.	160	60 minutes	40 minutes	15 minutes
Children	9.00 a.m.	220	60 minutes	90 minutes	N.A
Capacity			250	120	30

All members are divided into three categories based on their age and sex as males, females and children. All members report at the In-time and all of them do skating first. Members are entitled to use the specialties via. skating, softball or steam bath according to the first-come, first-served basis and the availability of space in that particular activity centre.

For example: All males (200) whose in-time is time is 7.30 a.m. are allowed to skate as the capacity of the skating centre is 250. When the females report at their in-time (8.30 a.m.) there are only 50 places available in the skating centre. So, the rest of the 110 females wait till it becomes available.

The additional information is given as below:

(i) No body can use the softball activity centre without going through the skating centre. If a member goes to the steam bath centre, he/she will have to go to the softball activity centre as well.

(ii) When members report to a particular centre, it is known as the reporting time for that centre; when they are allowed to enter the centre, it is known as their entry time for that centre. The difference between the reporting time and the entry time is known as the 'waiting time' for that centre.

(iii) 50% of the males who skate at a given time also play at the softball activity centre. Further, 50% of the males who go to the softball centre at a given time also visit the steam bath activity centre.

(iv) 60% of the females who skate at a given time also play at the softball activity centre. Further, 50% of the females who go to the softball activity centre at a given time also we the steam bath faritity.

(v) 50% of the children who swim at a given time also play at the soft ball centre. No child takes a steam bath.

(vi) Members are served on the first-come, first-served basis. Further, if their reporting time at a particular centre is the same, then they are entertained on the basis of their in-time.

10. What is the number of children whose waiting time is 0, before entering the softball activity centre?
(a) 1.1 (b) 2.6
(c) 3.19 (d) 4.40

11. What percentage of men out of the total number of men, went through all the three centres in the minimum possible time?
(a) 2.5% (b) 5%
(c) 7.5% (d) 10%

12. What is the difference between the number of women who took the maximum time and those who took the minimum time, respectively, for going through all the three centres?
(a) 2 (b) 5
(c) 18 (d) 23

13. What is the maximum time taken by any member who went through all the three centres?
(a) 110 minutes (b) 130 minutes
(c) 150 minutes (d) 170 minutes

14. How many children are waiting at 9 a.m. for skating?
(a) 90 (b) 110
(c) 130 (d) 150

Directions for questions 15 to 16: *Read the following passage and solve the questions based on it.*

There are five identical looking boxes containing different objects in each of them and every box has a label indicating its contents. The following table shours the correct description of the contents and the label on each box:

Contents	Label
Two Pins	PP
Two Balls	BB
Two Clips	CC
One Pin and one Clip	PC
One Ball and one Clip	BC

15. Somebody has mischievously interchanged these labels in such a way that no box carries the correct label describing its contents.
How many of the following statement/s is/are definitely true?

   I. If two boxes are opened and it is found that there are three clips and one ball, then CC and BC are the actual labels on the boxes.
   II. If two boxes are opened and it is found that there are a total of two clips and one pin among the four items inside the boxes, then PC and BC are the actual labels on the boxes.
   III. If two boxes are opened and it is found that there are two pins among the four items inside the boxes, then BC has to be one of the actual labels on the boxes.
   IV. If two boxes are opened and it is found that there is at least one clip and one ball among the four items inside the boxes, then at least one pin has to be there as well.

   (a) 1   (b) 2
   (c) 3   (d) None of these

16. Out of the five given boxes, three of the boxes have got their labels interchanged. It is also known that the boxes with the right labels contain at least one pin or at least one ball inside it. In how many ways can the labels be put on the five boxes satisfying the above given conditions?
   (a) 12   (b) 16
   (c) 24   (d) None of these

Directions for questions 17 to 22: *Read the following passage and solve the questions based on it.*

Transparency International is UN watch-dog which gives ranks to all the member countries of the UN in terms of the corruption level in the government machinery. There are 190 member countries of the UN since its establishment in 1945 and all of them are awarded the ranks which are valid for a particular year. The lower the rank, the less corruption infested the country is. And the higher the rank, the more corrupt the country is.

In the following table, the ranks of ten countries for three consecutive years are given. A positive change shows that the ranking has improved over the previous year and a negative change shows that the ranking has worsened over the previous year.

Table 1

Rank in 2006	Change over 2005	Country	Change over 2004
51	+3	Sri Lanka	−5
52	+4	Zambia	−3
53	+6	New Zealand	−7
54	−2	Tango	−3
55	+2	Austria	−3
56	−1	Hungary	+4
57	A	Australia	D
58	B	Kenya	E
59	C	Mozambique	F
60	Zero	UAE	NA

Somehow the data for Australia, Kenya and Mozambique are missing from the table. NA indicated that the country was not in the list of the given ranks in that particular year.

17. What is the minimum value of A + B + C?
   (a) 11   (b) 12
   (c) 13   (d) 14

18. What is the maximum value of D + E + F?
   (a) 14   (b) 15
   (c) 16   (d) 17

19. What is the minimum value of D + E + F?
   (a) 8   (b) 9
   (c) 10   (d) 11

20. How many countries from the given countries in the table have definitely improved their ranking consistently every year during the given period?
   (a) 1   (b) 2
   (c) 3   (d) Cannot be determined

21. What can be the minimum change in the rank of any country in 2006 with respect to its rank in 2004?
   (a) 0   (b) 1
   (c) 2   (d) 3

22. For how many countries is it possible to have the same ranks in all the three years?
   (a) 0   (b) 1
   (c) 2   (d) 3

Directions for questions 23 to 25: *Read the passage below and solve the questions based on it.*

Five friends—Amar, Binit, Charu, Deeksha, Eshwar, went to a fair. At a shooting stall there are three things to be shot–balloons, coins and needles. The number of

balloons shot are 1, 4, 5, 6 and 8, while the number of coins shot are 0, 1, 2, 4 and 6. Following details are available:

(i) The number of coins shot by Amar is three times the number of coins shot by the person who shot 4 balloons.

(ii) Three persons including the one who shot four coins, did not shot any needle.

(iii) Binit did not shoot any needle.

(iv) The one who shot one balloon did not shoot any needle or coin. It is also known that he was not Charu.

(v) Deeksha shot balloons and coins but no needle.

(vi) Charu shot half as many coins as the person who shot twice as many balloons as he did.

(vii) Eshwar shot two more balloons than Amar, but Amar shot two more coins than Eshwar.

23. Which of the following is true?
(a) Charu shot 8 balloons and 4 coins but no needle.
(b) The person who shot 5 balloons and one coin did not shoot any needle.
(c) The person who shot an equal number of balloons and coins also shot needles.
(d) The person who shot 4 balloons and 2 coins also shot needles.

24. Who shot an equal number of coins and balloons?
(a) Amar   (b) Binit
(c) Charu   (d) Deeksha

25. Which of the following is true?
(a) Deeksha shot 5 balloons
(b) Amar shot 8 balloons
(c) Eshwar shot 1 balloon
(d) Eshwar shot 6 balloons

ANSWER KEYS

1. (a)	**2.** (b)	**3.** (c)	**4.** (c)	**5.** (b)	**6.** (d)	**7.** (a)
8. (b)	**9.** (a)	**10.** (d)	**11.** (d)	**12.** (a)	**13.** (d)	**14.** (c)
15. (b)	**16.** (d)	**17.** (b)	**18.** (c)	**19.** (b)	**20.** (d)	**21.** (a)
22. (c)	**23.** (a)	**24.** (a)	**25.** (a)			

HINTS AND EXPLANATIONS

1 to 6

1. All option after than option (a) violates at least 1 condition.

2. If he did not pack hankerchief, he can take hat, tie & T-shirt with him. So, the maximum number of different types of clothing is 3.

3. If he packs hankerchief, then there must be at least 2 of them. So, the statement of option (c) must be false.

4. If he choose tie, he cannot choose hankerchief, so there will be loss of 2 item as hankerchief must be at least 2, if they are packed. So, he did not pack ties.

5. For minimum he can choose hat & then there will be only 1 type of clothing (as there is no condition for hat).

For maximum, there could be 2 hankerchiefs, 1 belt, 1 jacket, 1 vest, T-shirt & hats (no tie). So, for maximum there can be 6 different types of clothing.

So, correct answer is (1, 6).

6. As there is no vest, so there is possibility of no hankerchief & there cannot be any jacket. With belt, there must be hankerchiefs. So, we can choose option (d) only.

7 to 9

Five categories of the managers are:
(1) Production (P) (2) Marketing (M) (3) Human (H)
(4) Finance (F) (5) Management Information System (MIS)
Number of men = 3 and number of women = 2.
F will always sit next to a woman hence he is a male. The production manager is a male.
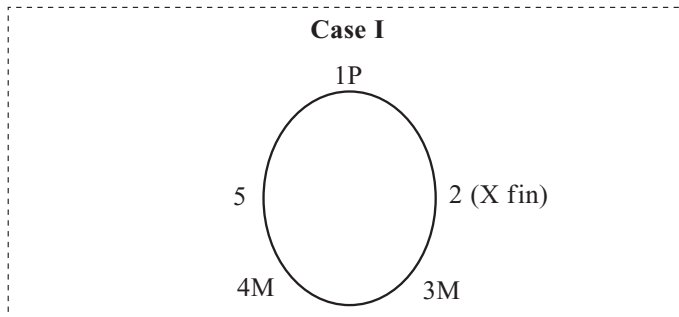
7. If H is a male:
Male – H, F, P
Female – M, MIS
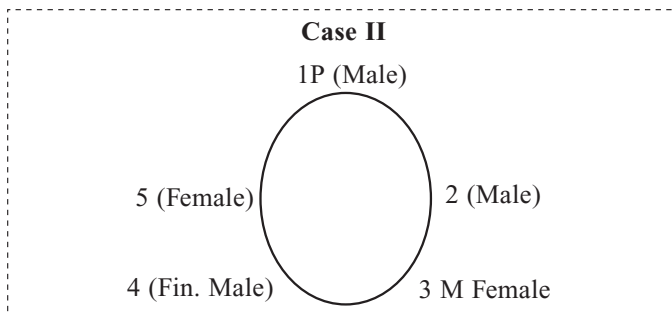As M herself is a woman so she cannot sit between the two women.
The statement in option (a) is definitely not true
Hence, the answer is option (a).

8.

Case I

Look at the above figure, finance (F) cannot be at the second position as he always has a woman to his right whereas P i.e., production manager is a man.
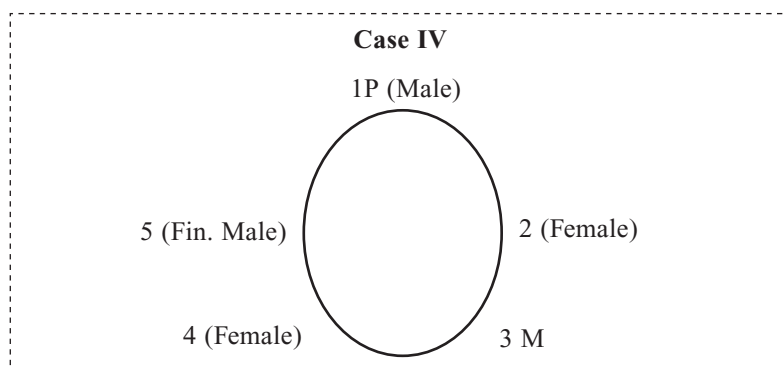

Case II

Assuming F is at the 4th position. Now M should be at the 3rd position because
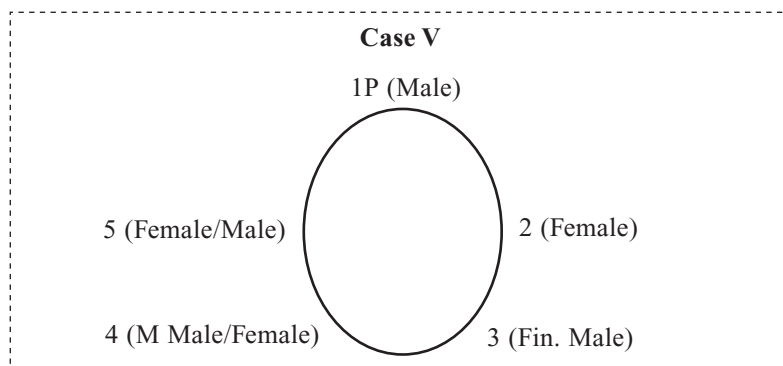
P should be seated as far as possible from M. Now M is a female as M is at the right of F. So 2nd position is occupied by a male as females cannot sit together. So the 5th position is occupied by a female. This is the 1st way.

Case III

1P (Male)

5 (Fin. Male)

2 (Female)
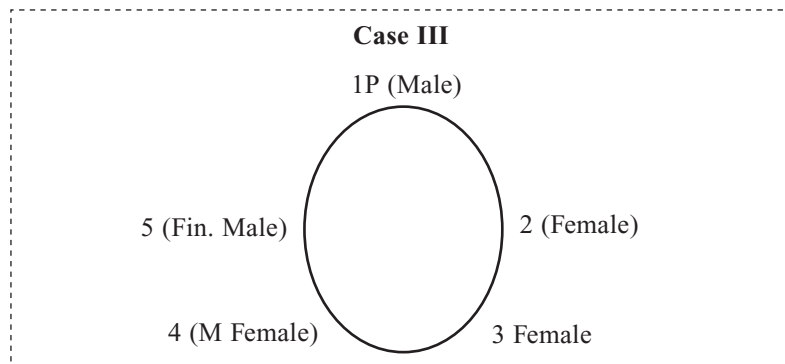
4 (M Female)

3 Female

When F is at the 5th position and the 4th position is occupied by M who is female because she is on the right of F. Therefore, the 2nd position is occupied by a female and the 3rd is occupied by a male. This is the 2nd way.

Case IV

1P (Male)

5 (Fin. Male)

2 (Female)

4 (Female)

3 M

Not possible.

Case V

1P (Male)

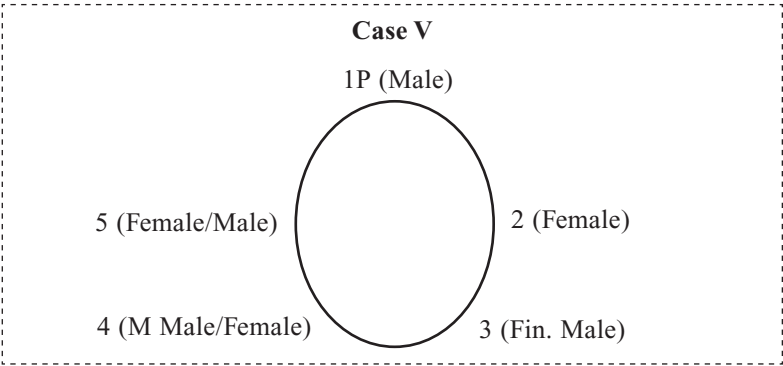5 (Female/Male)

2 (Female)

4 (M Male/Female)

3 (Fin. Male)

When F is at the 3rd position, the 2nd is occupied by a female. Now the 4th position is occupied by M who can be a male/female. But we can take a case from here in which M is a female. In that case the 5th position is occupied by a male.

This is the 3rd way.

Hence, in all, three arrangements are possible.

So, the answer is option (b).

9. We can solve by negating the options given:

Case V

1P (Male)

5 (Female/Male)

2 (Female)

4 (M Male/Female)

3 (Fin. Male)

If MIS is a female and M is at the 4th position then the 3rd position can be occupied by F who is a male and the 2nd position by H who can be a female. So the condition III negated that H has to be a woman.

Now, let us see another case where H is a male. Now the 2nd option also gets negated that H has to be a female.

Therefore the answer is (I) only. Hence the option (a) is the correct answer.

10 to 14

	N1	Skating		N2	Soft ball		N3	Steam Bath	
	In=R Entry	Exit		R	Entry Exit		R	Entry Exit	
Males	200 7.30 7.30	9.00	100	9.00	9.00 10.15	20	10.15 10.15 10.35		
			20	9.30	9.30 10.10	5	10.15 10.25 10.45		
	50 8.30 8.30	9.30	10	9.30	10.10 10.50	10	10.10 10.10 10.25		
Females			10	10.10	10.10 10.50	5	10.50 10.50 11.05		
	110 8.30 9.00	10.00				5	10.50 10.50 11.05		
			56	10.00	10.15 10.55				
						20	10.55 10.55 11.10		
	9.00 9.00	10.00	44	10.00	10.15 11.45	8	10.55 11.05 11.20		
	90		1	10.00	10.50 12.20				
Kids	9.00 9.30	10.30	19	10.30	10.50 12.20				
	50		6	10.30	10.55 12.25				
	80 9.00 10.00	11.00	40	11.00	11.00 12.30				

10. For 40 children (at the bottom of the table) the waiting time is zero. Hence, option (d) is correct.

11. A total of 20 males go through all the three centers in the minimum possible time. At 7.30 a.m. they enter the centre and at 10.35 a.m. they exit from the steam bath centre. Hence, 10% of the males took the minimum possible time. Therefore, option (d) is correct.

12. A total of 10 women took the minimum time (at 8.30 a.m. they enter and at 10.25 a.m. they exit from the steam bath centre). Similarly, 8 females took the maximum time (at 8.30 a.m. they entered whereas at 11.20 a.m. they exit from the steam bath centre). So, the difference between the maximum and the minimum is 10–8 = 2. Hence, the option (a) is correct.

13. The maximum time taken by any male (5) is 135 minutes (from 7.30 a.m. to 10.45 a.m.). The maximum time taken by a female (8) is 170 minutes (8.30 a.m. to 11.20 a.m) which is greater than the maximum time taken by any male. Hence, option (d) is correct.

14. At 9 a.m. all the males will be out of the skating centre and the only people inside the centers will be females. The total number of females inside the skating activity centre at 9 a.m. = 160. Hence, 90 more members can be accommodated inside. So, (220 – 90) 130 children will be waiting.

15 to 16

15. Only statements I and II are definitely true.

16. The correct ones should be either PP + BB, or, PP + BC, or, BC + PC.

17 to 22

17.

2006	2005	Country	2004
57	A	Australia	D
58	B	Kenya	E
59	C	Mozambique	F

The possible ranks for these three countries in 2005 = 51/53/58.
The minimum difference will occur if the signs of the change (+ or –) for these three countries are the same.

57	51	Australia
58	58	Kenya
59	53	Mozambique

Hence, net change = 12
Alternatively, for minimum change = Sum of ranks in 2006 – sum of ranks in 2005 = (57 + 58 + 59) – (51 + 58 + 53) = 12.

18.

57	51	Australia	60
58	53	Kenya	58
59	58	Mozambique	56

Hence, the maximum value of D + E + F = 9 + 5 + 2 = 16

19.

57	51	Australia	56
58	53	Kenya	57
59	58	Mozawmbique	58

Min value of D + E + F = 9

20. Cannot be determined because the ranks in 2005 and 2004 can be interchanged to give different answers.

21. The ranks available for 2004 = 56/57/58/60. Obviously the ranks 57 and 58 can be given to Australia and Kenya in 2006 as well as 2004. Hence, the difference = 0.

22. Since the question asks for possibility, we will have to see all the different options possible.
Ranks available for 2005 = 51/53/58 and
Ranks available for 2004 = 56/57/58/60.
We can see that rank 58 is available for both the years 2004 and 2005. The same rank can be given to Kenya during the whole given period.

23 to 25

We can make table for this arrangement with 5 rows (1 for each friend) & 4 columns showing their names, & number of balloons, coins & needles shot by them. The number of balloons shot are 1, 4, 5, 6 & 8 while the number of coins shot are 0, 1, 2, 4 & 6.

The number of coins shot by Amar is 3 times the number of coins shot by the person who shot 4 balloons. So, Amar must have shot 6 coins & the person who shot 4 balloons must have shot 2 coins. The information about Amar can be shown in 1st row & about other person in 2nd row

The person who shot 1 balloon did not shoot any needle or coin & he was not Charu. This information can be filled in 3rd row

Eshwar shot 2 more balloons & 2 less coins than Amar. So, he must have shot 4 coins. There is only 1 possibility for numbers of balloons shot by them & it is 6 & 8 balloons by Amar & Eshwar. This information can be filled in 4th row

The person who shot 4 coins did not shoot any needle, so Eshwar did not shoot any needle. The table obtained is as:

Name	No. of balloons	No. of coins	No. of needles
Amar	6	6	
	4	2	
× Charu	1	0	0
Eshwar	8	4	0

Charu shot half as many coins as the person who shot twice as many balloons as he did. So, the other person must have shot exactly twice as many balloons & coins as Charu. The only possibility is that the other person is Eshwar & Charu is person in row 2nd . Deeksha shot balloons & coins but not needle, so must be in row 5th with 5

balloons & 1 coin & 0 needle. The 3rd row must have Binit. The number of needles shot by Amar & charu must not be 0

Name	No. of balloons	No. of coins	No. of needles
Amar	6	6	Non-zero
Charu	4	2	Non-zero
Binit	1	0	0
Eshwar	8	4	0
Deeksha	5	1	0

23. Charu shot 4 balloons & 2 coins & shot some needles too. So, statement in option (a) must be wrong. So, correct option is (a)

24. Amar shot 6 balloons & 6 coins. So, Amar shot an equal number of coins & balloons

25. Deeksha shot 5 balloons. So, option (a) is correct

Directions for questions 1 to 6: *Read the following passage and solve the questions based on it.*

Looking upon the influx of high profile and sensitive cases in the Supreme Court. The CJI has decided that each case will be heard on a day to day basis by making a group of judges out of seven senior judges—Bindra, Goel, Kalyan, Mahajan, Deshbandhu, Raheja and Sinha. However all the judges need to serve on the panels collectively. They can serve either alone or in groups together, consistent with the following conditions:

(i) Bindra serves on every panel that Kalyan serves on.
(ii) Kalyan serves on every panel that Sinha serves on.
(iii) Mahajan serves on every panel that Raheja does not serve on.
(iv) If Bindra serves on a panel then neither Goel nor Mahajan serve on that panel.

1. Which one of the following could be a complete list of the judges who serve together on one panel?
    (a) Goel, Kalyan, Raheja, Sinha
    (b) Goel, Mahajan, Deshbandhu, Raheja
    (c) Bindra, Kalyan, Mahajan, Deshbandhu
    (d) Bindra, Deshbandhu, Raheja, Sinha
    (e) Goel, Kalyan, Deshbandhu, Sinha

2. What is the maximum number of judges who could serve on a panel that Raheja does not serve on?
    (a) Two   (b) Three   (c) Four
    (d) Five   (e) Six

3. If exactly three judges serve together on a panel, then each of the following must be true except
    (a) Bindra and Kalyan both serve on the panel.
    (b) Raheja and Deshbandhu both serve on the panel.
    (c) Deshbandhu and Mahajan both serve on the panel.
    (d) Kalyan and Deshbandhu both serve on the panel.
    (e) Goel and Raheja both serve on the panel.

4. If Sinha and Deshbandhu serve together on a panel, then exactly what would be the size of the panel?
    (a) One   (b) Two   (c) Three
    (d) Four   (e) Five

5. If Goel and Deshbandhu serve on a panel together, then which one of the following must be true?
    (a) Sinha does not serve on the panel
    (b) Bindra also serves on the panel
    (c) Raheja also serves on the panel
    (d) Kalyan also serves on the panel
    (e) Mahajan does not serve on the panel

6. What is the largest possible size of the panel?
    (a) 4   (b) 5   (c) 6
    (d) 5 or 6   (e) Cannot be determined

Directions for questions 7 to 11: *Read the following passage and solve the questions based on it.*

There are seven friends—A, B, C, D, E, G and H at a B-School. They specialize in exactly one of the two areas: Marketing or Systems. The students choose their specialization in accordance with the following:

 (i) If D specializes in Systems then B specializes in Marketing.
 (ii) If E specializes in Systems then H and A both specialize in Marketing.
(iii) G does not choose the same specialization as D.
(iv) If C specializes in Systems, then B also specializes in Systems.

7. Which one of the following could be a complete and accurate list of students who specialize in Systems?
   (a) D, E, C   (b) H, A, G   (c) B, H, C
   (d) B, A, G, C   (e) D, B, H, G

8. If D specializes in Marketing then which one of the following must not be true?
   (a) E specializes in Marketing
   (b) G specializes in Marketing
   (c) B specializes in Systems
   (d) C specializes in Systems
   (e) H specializes in Systems

9. If H and G both specialize in Systems, then which one of the following could be true?
   (a) E and A both specialize in Marketing
   (b) C and A both specialize in Systems
   (c) D and A both specialize in Marketing
   (d) B and C both specialize in Systems
   (e) D and E both specialize in Systems

10. What is the maximum number of friends who could specialize in Systems?
   (a) 2   (b) 3   (c) 4
   (d) 5   (c) 6

11. Which one of the following is a pair of friends who cannot specialize in Marketing together?
   (a) H and G   (b) D and B   (c) D and G
   (d) H and A   (e) B and G

Directions for questions 12 to 15: *Read the following passage and solve the questions based on it.*

King Amitabh of Bollysteel organized initials to decide the groom for his daughter in two steps—The preliminary stage and the final stage. The preliminary stage comprised of a written test whereas in the final stage there was an archery competition. The archery competition consisted of five rounds wherein the contestants could score from 2 to 9 points in each round. The prince who scored the maximum points in these five rounds would be considered the winner in the overall standing and would marry the princess.

     When the results of the preliminary stage were announced, it was found that only five princes—Shikari, Bhikhari, Atyachari, Juari and Hazari, qualified the preliminary stage and hence these were the only contestants left to complete in the final stage.

     During the final stage, however, the inilats who was tabulating the scores of the princes started taking sporadic short naps and so at the end, when King Amitabh asked for the score-card to find out the final winner, he was presented the following Table:

	1st Round	2nd Round	3rd Round	4th Round	5th Round
Shikari	9		8		3
Bhikhari		2	3		
Atyachari	2	9	4	8	
Juari	4	6		5	8
Hazari		3			9

However, the initals has made the following observations too:
  (i)   No two princes had scored equally in any round.
 (ii)   The difference between the total points scored by Prince Shikari and Prince juari was 6 points.
(iii)   Prince Bhikhari's total points were always greater than that of Prince Atyachari's total points.
(iv)   Prince Shikari scored an even number of points both in the 2nd and the 4th rounds.
 (v)   Each of the five princes scored greater than or equal to 24 points in the five rounds.
(vi)   There was tie between any two princes in their overall points.

12. Prince Juari won the competition and married the Princess. Also, Prince Bhikhari scored 28 points from the five rounds. Then which of the following could be false?
   (a) Prince Atyachari scores more points than Prince Hazari in round 4
   (b) Prince Shikari scores more points than Prince Hazari in round 2
   (c) Prince Bhikhari scores more points than Prince Hazari in round 1
   (d) Prince Juari scores more than Prince Shikari in round 3
   (e) None of these

13. If Prince Juari scores 5 points in the 3rd round and Prince Atyachari scores 4 points in the 5th round, then which of the following will definitely be false?
   (a) Prince Shikari is 1st in the overall standing
   (b) Prince Hazari is 2nd in the overall standing
   (c) Prince Atyachari is 3rd in the overall standing
   (d) Prince Juari is 4th in the overall standing
   (e) None of these

14. If Prince Hazari scores 2 points in the 3rd round. Then, which of the following statements is sufficient to decide the winner?
    I. Prince Atyachari scores the maximum possible points in the 5th round.
   II. Prince Juari scores the maximum possible points in the 3rd round.
   (a) Only I
   (b) Only II
   (c) I and II
   (d) Even I and II together are not sufficient to decide the winner
   (e) Using either I or II will be sufficient to decide the winner

15. If Prince Atyachari scores 5 points in the 5th Round but Prince Hazari becomes the winner with the least possible total points, then what is the least possible points scored by Prince Hazari in the 3rd round?
   (a) 5   (b) 6   (c) 7
   (d) 8   (e) Cannot be determined

Directions for questions 16 to 17: *Read the following passage and solve the questions based on it.*

There are seven persons—I, J, K, L, M, N and O in a family. They have one set each of the following three games–cards, baseball and tag.

Following are the details pertaining to the games that they play among themselves:

(i) Each person must play exactly two out of the three games.
(ii) I must play cards.
(iii) K must play tag.
(iv) N must play baseball.
(v) M must play both games which I plays.
(vi) O must play both games which L plays.
(vi) Cards must be played by either 3 or 4 persons
(vii) Baseball must be played by either 4 or 6 persons
(ix) Tag can be played by any number of persons as long as there are a minimum of 2 persons.

16. If K plays the same two games as N plays, then which of the following is not true?
    (a) I plays cards   (b) N plays cards   (c) K plays baseball
    (d) N plays tag   (d) None of these

17. If I and N play tag and four persons play cards, then the persons playing cards besides I and M are necessarily one of the following options.
    (a) J and K   (b) J and N   (c) K and N
    (d) K and O   (e) None of these

Directions for questions 18 to 20: *Read the following passage and solve the questions based on it.*

(i) In a newly constructed market, six shops on a floor in two rows facing North and South are allotted to U, V, W, X, Y and Z, not necessarily in that order. The number of shops in both the rows are equal in number.
(ii) V gets a North-facing shop and is not next to X.
(iii) W, which is next to Z gets a South-facing shop and Y gets a North-facing shop.

18. If X and Z get diagonally opposite shops and both these shops can never be at the extremes, then in how many ways can the be allotments of the shops done?
    (a) 2   (b) 4   (c) 6
    (d) 8   (e) None of these

19. In the above question, whose shop is between V and X?
    (a) Z   (b) Y   (c) W
    (d) U   (e) Cannot be determined

20. In Q. 18, the shops of which other pairs, apart from X and Z are diagonally opposite to each other?
    (a) U and Y   (b) V and U   (c) V and W
    (d) Y and X   (e) None of these

Directions for questions 21 to 25: *Read the following passage and solve the questions based on it.*

During the Doha Asian Games 2006, the following teams played in the soccer event— Afghanistan, Nepal, Pakistan, India, South Korea and Bangladesh. In the event, each team played with every other team exactly once.

The following was the scoring pattern of the event:

  (i)   Each win gave three points to the winning team
 (ii)   Each draw gave one point to each of the teams
(iii)   There was no point for a loss.

Following was the table of the points at the end of all the matches in the soccer event. The table showed the ranks of the teams in terms of points scored by them in the decreasing order of their total points.

      Some information had been deliberately kept on hold due to certain reasons which were not to be made public. Even the results of the matches were not declared.

      However, on public demand the result of only one match, which was played between India and Pakistan, was declared. It was announced that Pakistan had beaten India.

      It was also given that no two teams finished with the same number of points.

      For the sake of convenience, all the teams were denoted by their initials only.

Table 1

Position	Team	Won	Drawn	Lost	Goals For	Goals Against	Total points
1	A				17	5	15
2	N				9	6	10
3	P					2	8
4	I				2	5	
5	S K				7	11	2
6	B				8	16	

21. Which of the following matches was a draw?
    (a) I vs N   (b) I vs S K   (c) B vs N
    (d) B vs S K   (e) None of these

22. What was the total number of points scored by I?
    (a) 3   (b) 5   (c) 6
    (d) 7   (e) Cannot be determined

23. Find the total number of goals scored in the match between N and P.
    (a) 3   (b) 2   (c) 0
    (d) 4   (e) Cannot be determined

24. The number of goals scored by A against I could be at the most
    (a) 2   (b) 3   (c) 4
    (d) 5   (e) 6

25. For how many teams could we determine the total points?
    (a) 4   (b) 5   (c) 6
    (d) 5 or 6   (e) Cannot be determined

HINTS AND EXPLANATIONS

1 to 11

1. The option (a); (c); (d) & (e) contradicts at least 1 of the given 4 conditions.
   So, correct option is (b)

2. As Raheja is not in the panel, so there must be Mahajan. Now, Bindra cannot serve on this panel & so Kalyan too cannot serve the panel. Further, Sinha too cannot serve the panel. So, there can be maximum 3 judges to serve the panel who are Mahajan, Goel & Deshbandhu.

3. If we have Kalyan on panel, we must also have Bindra & Sinha too. So, if Kalyan & Deshbandhu are there on panel, there must be at least 4 on the panel. So, statement of option (d) is not true.

4. If Sinha serve on a panel, Kalyan will also serve the panel. Now, Bindra will also be there. As there is Bindra, so Goel & Mahajan cannot serve the panel. Raheja can also be added. Deshbandhu is already in the panel. So, there are total 5 members in the panel.

5. If there is Goel, we cannot have Bindra, Kalyan or Sinha. So, option (a) is correct.

6. There are 2 condition based on Bindra. So, we can make 2 cases of including & excluding him. If we include Bindra there can be 5 members & if we exclude him, there can be 3.

7. Only option (b) do not contradict any of the given 4 conditions. All other option contradicts at least 1 condition.

8. As G do not choose the same specialization as D, so G cannot specialize in the marketing. Correct option is (b).

9. As H specializes in system, so E must not have taken system for the specialization. So, the specialization of E is marketing. So, option (a) could be true.

10. G, C, B, E & D could specialize in systems while H & A can do specialization in marketing. So, maximum 5 friends could specialize in systems.

11. D & G cannot choose same specialization as per condition (iii).

12 to 15

■ Shikari-Juari = 6. Prince Shikari and Prince Juari will always have a difference of 6 points in their overall points. Though any one of them may have 6 points more than the other.

■ Considering the overall points, Bhikhari > Atyachari.

- Also Prince Shikari scores 4/8 point in the 2nd round and 2/4/6 points in the 4th round.

   We can conclude the following:

12. If Prince Juari wins the competition and marries the princess and Prince Bhikhari scores 28 points from the given 5 rounds, then the table will be as given below:

Table 2

Prince	1st Round	2nd Round	3rd Round	4th Round	5th Round	Total
Shikari	9	4	8	2	3	26
Bhikhari	7	2	3	9	7	28
Atyachari	2	9	4	8		
Juari	4	6	9	5	8	32
Hazari		3			9	

   If Shikari has scored points in the 2nd and the 4th rounds then the score of Juari should be 32 (i.e., 6 more). And in this case Juari has to score 9 points in the 3rd round.

   Option (a), (b) and (d) will definitely be true for all cases. Only statement (c) could be false.

   Hence, the correct option is (c).

13.

Prince	1st Round	2nd Round	3rd Round	4th Round	5th Round	Total
Shikari	9	8	8	6	3	34
Bhikhari	7	2	3	9	7	29
Atyachari	2	9	4	8	4	27
Juari	4	6	5	5	8	28
Hazari		3			9	

   Since, The total points scored by Juari are 28 so, Shikari will score a total of 34 points. So, he must have scored 8 points in the 2nd round and 6 points in the 4th round. Also, Prince Atyachari has scored a total of 27 points. Hence, Prince Bhikhari must score 29 points (as there are no ties) so Bhikhari scores 8,9,7 points respectively from the 1st, 4th and the 5th rounds. As it can be clearly seen from the table that Atyachari is fourth or fifth even though we do not know about Hazari's score.

   So, option (c) is the correct answer.

14. According to statement I, Prince Atyachari can score a maximum of 5 points in the 5th round which make his total points 28. As Prince Bhikhari can score a maximum of 29 points and Atyachari's score is always less than Bhikhari's score we get table as given below:

Table 3

Prince	1st Round	2nd Round	3rd Round	4th Round	5th Round	Total
Shikari	9		8	6		
Bhikhari	8	2	3	9	7	29
Atyachari	2	9	4	8	5	28
Juari	4	6		5	8	
Hazari		3	2		9	

According to statement II, Juari scores the maximum possible point which is 9 in the 3rd round. Then his total will be 32. Also, Hazari can score a maximum of 30 points if he scores 7 points each in the 1st and the 4th rounds. So, Juari will always be the winner with a total of 32 points.

Prince	1st Round	2nd Round	3rd Round	4th Round	5th Round	Total
Shikari	9	4	8		2	26
Bhikhari	8	2	3	9	7	29 (max)
Atyachari	2	9	4	8	4	28 (max)
Juari	4	6		5	8	32
Hazari		3		7	9	

Hence, statement II alone is sufficient to answer the question.
Therefore, option (b) is the answer.

15.

Prince	1st Round	2nd Round	3rd Round	4th Round	5th Round	Total
Shikari	9		8		3	26
Bhikhari	8	2	3	9	7	29 (max)
Atyachari	2	9	4	8	5	28 (max)
Juari	4	6		5	8	32
Hazari	7	3		7	9	

The minimum score required by Hazari to win is 33 points. When Prince Atyachari scores 5 points in the 5th round, then the total points scored by him are 28. So, Prince Bhikhari must score more than 28 points. But taking into consideration the given table, Prince Bhikhari can score a maximum of 29 points if he scores 8, 9, 7 points in the 1st, 4th and the 5th rounds respectively. But, one among Juari and Shikari will at least score 32. And Hazari can score a maximum (for the 3rd round to be minimum) of 7 points each in the Ist and the 4th rounds. So, the least possible points scored by Prince

Hazari in the 3rd round = 33 – (7 + 3 + 7 + 9) = 7 which makes his total score as 33.

Therefore, option (c) is the answer.

16 and 17

On the basis of the given information, we can make the following table:

Cards	Tag	Baseball
I		
M	K	N

16. If K plays the same two games as N plays, this means that K and N will play tag and baseball. Therefore options (a), (c) and (d) are true and option (b) is false.

17. I and N play tag and the fourth condition says that N must play baseball. Since no player can play more than two games, N cannot be one of the other two other persons playing cards. So options (b) and (c) are ruled out.

Option (d) cannot be the answer because O and L have to play together. Therefore option (a) is the correct answer.

18 to 20

There are six shops U, V, W, X, Y and Z arranged in two rows such that the number of shops in both the rows are equal in number.

18. Using the given statements, we can conclude that:
North-facing shop:X, Y V
South-facing shop:W, Z, U
Hence, there are four arrangements possible.

U	Z	W
V	Y	X

OR,

U	Z	W
X	Y	V

OR,

W	Z	U
V	Y	X

OR,

W	Z	U
X	Y	V

Hence, option (b) is the answer.

19. The shop between V and X is Y.
Hence, the answer is option (b).

20. It can be seen that diagonally opposite to each other are U and Y.
Hence, the answer is option (a).

21 to 25

There are total 6 teams & each team played with every other team exactly once. So, there were total 15 matches. Each team played 5 games. The teams got 3, 1 & 0 points for win, draw & loss. The table given is incomplete which is as

Position	Team	Won	Drawn	Lost	Goals For	Goals Against	Total Points
1	A				17	5	15
2	N				9	6	10
3	P					2	8
4	I				2	5	
5	SK				7	11	2
6	B				8	16	

The goals for & goals against for all 6 teams must be equal, so the number of goals for P must be 2. A got 15 points, so it has won all 5 matches (with 0 lost or drawn). N got 10 points, so it must have won 3 games & 1 must been drawn while it lost 1 game. In a similar way we can conclude that P won 2 games, while it lost 1 & 2 were drawn. SK lost 3 games, 2 were drawn & it did not win any game. For teams I & B, it cannot be clearly found. We know I lost from P & A won all 5 games, so I must have at least 2 losses. As B got 5th position, so it must have got 0 or 1 point.

Case 1: If B got 0 point: It must have lost all 5 games with 0 win & drawn. Then possibilities for I are:

1st scenario for I: 0 win, 0 loss & 5 drawn & 5 points- Not feasible as A has no drawn.

2nd scenario for I: 1 win, 1 loss & 3 drawn & 6 points- not feasible as I must have at least 2 loss (1 from A as it has won all 5 matches & 1 from P, as it is given information).

3rd scenario for I: 2 win, 2 loss & 1 drawn & 7 points- it seems feasible with 12 matches in win-loss & 3 in draws.

This (case 1- 3rd scenario) gives following table:

Position	Team	Won	Drawn	Lost	Goals For	Goals Against	Total Points
1	A	5	0	0	17	5	15
2	N	3	1	1	9	6	10
3	P	2	2	1	2	2	8
4	I	2	1	2	2	5	7
5	SK	0	2	3	7	11	2
6	B	0	0	5	8	16	0

In this possible scenario, I lost 2 matches which must be won by P & A. N must have lost match against A. It must have won against P, SK & B. It must have drawn with I. Now, A & B have 0 draws, while N & SK have 2 draws, but It is not possible as it shows 2 draw matches between them, while they played with each other just once. So, this scenario is not feasible.

Case 2: If B got 1 point: It must have lost 4 games with 0 win & 1 drawn. Then possibilities for I are:

1st scenario for I: 0 win, 1 loss & 4 drawn & 4 points- not feasible as I must have at least 2 losses (1 from A as it has won all 5 matches & 1 from P, as it is given information).

2nd scenario for I: 1 win, 2 loss & 2 drawn & 5 points- it seems feasible with 11 matches in win-loss & 4 in draws.

3rd scenario for I: 2 win, 3 loss & 0 drawn & 6 points- it seems feasible with 12 matches in win-loss & 3 in draws.

Case 2: 2nd scenario gives following table:

Position	Team	Won	Drawn	Lost	Goals For	Goals Against	Total Points
1	A	5	0	0	17	5	15
2	N	3	1	1	9	6	10
3	P	2	2	1	2	2	8
4	I	1	2	2	2	5	5
5	SK	0	2	3	7	11	2
6	B	0	1	4	8	16	1

But in this case, P & N both can have only 1 loss against A. Now, I lost against A & P. So, I must have drawn against N. Further, match between N & P must been drawn. So, there must be 2 draws for N. But, N can have only 1 draw match. So, this scenario is not feasible

Case 2: 3rd scenario gives following table:

Position	Team	Won	Drawn	Lost	Goals For	Goals Against	Total Points
1	A	5	0	0	17	5	15
2	N	3	1	1	9	6	10
3	P	2	2	1	2	2	8
4	I	2	0	3	2	5	5
5	SK	0	2	3	7	11	2
6	B	0	1	4	8	16	1

In this case I lost 3 matches, which must be from A, P & N (it is clear I lost to P & A, it lost to N as SK & B won no match, so it can lose 3rd match from N only) & won 2 matches against SK & B. P lost just 1 match which must be against A, so its match with N must been a draw. The 2nd draw for P must been with SK, else SK will left alone with 2 draws. So, match between P & SK was draw & P won from I & B. N won from I, SK & B, lost against A with a draw against P. SK lost against A, N & I, with draw with B & P. B lost 4 matches it played with A, P, N & I, its match with SK was draw.

> So, A- won all 5 matches against N, P, I, SK & B, no loss, no draw
> N- won against I, SK & B, lost to A, draw with P
> P -won against B & I, lost to A, draw with N & SK
> I- won against SK & B, lost to A, N & P, no draw
> SK- no win, lost to A, N & I, draw with P & B
> B- no win, lost to A, N, P & I, draw with SK

21. B vs SK was a draw

22. I has 2 win & 3 losses, so its total score is 6 points

23. P won 2 matches & it scored 2 goals in total 5 games, so the score of both the matches it won (against I & B) must been 1-0 (P scored 1 & opponent scored 0). Now, total goals against P in series are 2. But, its match with N must been a draw. It must not have scored any goal in that match. As match is a draw, so N must have also scored 0 goals in that match. So, total goals scored in P vs N match must been 0.

24. I won 2 matches & it scored 2 goals in total 5 games, so the score of both the matches it won (against SK & B) must been 1-0 (I scored 1 & opponent scored 0). Now, total goals against I in series are 5 & it lost total 3 games. If we want to maximise the goals against I in I vs A match, then goals against I in other 2 matches it lost must be minimised. So, if we assume it lost both matches with score of 0-1 (I scored 0 & opponent team scored 1). Then, A could have scored 3 (maximum possible) goals against it in A vs I match.

25. We can find total points for all 6 teams i.e. for A, N, P, I, SK & B (which are 15, 10, 8, 6, 2 & 1 respectively).

Directions for questions 1 to 6: *Read the following passage and solve the questions based on it.*

  (i) Six businessmen from six different nations are staying in six successive in a hotel.

  (ii) Each of them owns a number of cars and has donated to a number of institutions last year.

  (iii) The businessman in room number 102 owns twice as many cars as the businessman who donated to 8 institutions last year.

  (iv) The businessman from Uruguay and the businessman in room number 106 together own a total of 40 cars.

  (v) The businessman from Argentina owns 8 cars less than the businessman from England but donated to 10 more institutions last year.

  (vi) Four times the number of cars owned by the businessman in room number 104 is lesser than the number of institutions to which he donated last year.

  (vii) The businessman in room number103 owns 12 cars and donated to 8 institutions last year.

  (viii) The businessman who owns 16 cars donated to 24 institutions last year.

  (ix) The businessman in room number 105 owns 8 cars and donated to 2 institutions less than the businessman from Canada last year.

  (x) The Brazilian businessman is staying two rooms ahead of the English businessman who is staying two rooms ahead of the Canadian businessman.

1. In which room is the Brazilian businessman staying?
  (a) Room number 102   (b) Room number 103
  (c) Room number 104   (d) Room number 105

2. How many institutions did the Argentinean businessman donate to last year?
  (a) 8   (b) 3
  (c) 18   (d) 24

3. The businessman of which country is staying in room number 106?
  (a) Argentina   (b) Canada
  (c) Uruguay   (d) Germany

4. The businessman of which country donated to 24 institutions last year?
  (a) Argentina   (b) Uruguay
  (c) Canada   (d) Germany

5. The businessman of which country owns the maximum cars?
  (a) Argentina   (b) Uruguay
  (c) Germany   (d) Brazil

6. How many cars does the English businessman own?
  (a) 8   (b) 12
  (c) 4   (d) 20

Directions for questions 7 to 11: *Read the following passage and solve the questions based on it.*

The table below represents the average price of all the cars sold in a particular year from the year 2000–2004.

Table 5

Year	2000	2001	2002	2003	2004
Average price (in ₹thousand)	30	40	P	30	50

Table 6

| Years	Number of cars sold
Total number of cars sold in 2000 + 2001	A
Total number of cars sold in 2001 + 2002	B
Total number of cars sold in 2002 + 2003	C
Total number of cars sold in 2003 + 2004	D
Total number of cars sold in 2004 + 2000	E

7. (I) If the value of P = 40, then only table 1 is sufficient to find the average price of all the cars sold in 2002.
   (II) If the value of P is not given, then whatever is the value of A, B, C, D and E, the average price of all the cars sold in 2002 cannot be calculated.
   (a) Only I is true
   (b) Only II is true
   (c) Both I and II are true
   (d) None of the two is true

8. (I) If the value of P = 40, then in 2002 no car has been sold.
   (II) If the value of P is given and it is not equal to 40, then the value of any three out of A, B, C, D and E is sufficient to find the value of the average price of all the cars sold in 2002.
   (a) Only I is true
   (b) Only II is true
   (c) Both I and II are true
   (d) None of the two is true

9. To find out the total number of cars sold in 2002 and 2003, we need the following:
   (a) Only the value of P
   (b) Value of P, A, B, C and D
   (c) Value of P, A, B, C, D and E
   (d) Cannot be determined

(Additional information for questions 10 to 11: Disregard table 2 for both the questions).

10. For what value of P, will the total number of cars sold in all the years be the least?
    (a) P = 30
    (b) P > 40
    (c) P = 40
    (d) Cannot be determined uniquely

11. It is given that in one particular year no car is sold. Which of the following is most likely to be that year?
    (a) 2000
    (b) 2001
    (c) 2003
    (d) 2004

Directions for questions 12 to 14: *Read the following passage and solve the questions based on it.*

The following questions are based on the diagram given below, showing four persons—A, B, C and D stationed at the four corners of a square piece of plot as shown:
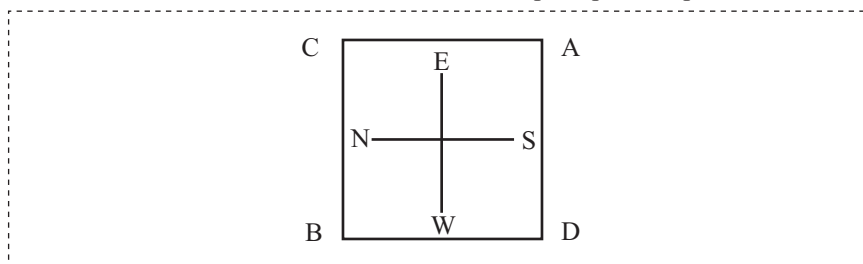
E – East, S – South, W – West and N – North

12. From the original position, B and D move one and a half lengths of sides clockwise and anti-clockwise respectively. Which one of the following statements is true?
   (a) B and D are both at the mid-point between A and C
   (b) D is at the mid-point between A and C; and B is at the corner originally occupied by C
   (c) B is at the mid-point between A and C; and D is at the corner originally occupied by A
   (d) B and D are both at the mid-point between A and D

13. From the positions in the original figure, C and A move diagonally to the opposite corners and then one side each clockwise and anti-clock wise respectively. Where is A now?
   (a) At the north-west corner
   (b) At the north-east corner
   (c) At the south-east corner
   (d) At the south-west corner

14. From the positions in the original figure, C and A move diagonally to the opposite corners and then one side each clockwise and anti-clockwise respectively. B and D move two sides each clockwise and anti-clockwise respectively. Who is now at the north-west corner?
   (a) A
   (b) B
   (c) C
   (d) D

Directions for questions 15 to 19: *Read the following passage and solve the questions based on it.*

All the roads of a city are straight and perpendicular or parallel to each other. Roads A, B, C, D and E are parallel to one another. Roads G, H, I, J, K, L and M are parallel to one another.

  (i)   Road A is 1 km east of road B
 (ii)   Road B is 0.5 km west of road C
(iii)   Road D is 1 km west of road E
 (iv)   Road G is 0.5 km south of road H
  (v)   Road I is 1 km north of road J
 (vi)   Road K is 0.5 km north of road L
(vii)   Road K is 1 km south of road M

15. Which is essentially true?
   (a) E and B intersect
   (b) D is 2 km west of B
   (c) D is at least 2 km west of A
   (d) M is 1.5 km north of L

16. If E is between B and C, then which of the following is false?
   (a) D is 2 km west of A
   (b) C is less than 1.5 km from D
   (c) E is less than 1 km from A
   (d) D is less than 1 km from B

17. If road E is between B and C, then the distance between A and D is
   (a) 0.5 km
   (b) 1 km
   (c) 1.5 km
   (d) 1.8 km

18. Which of the following possibilities would make two roads coincide?
   (a) L is 0.5 km north of I
   (b) C is 1 km west of D
   (c) D is 0.5 km east of A
   (d) E and B are 0.5 km apart

19. If K is parallel to I and K is 0.5 km south of J and 1 km north of G, then which two roads would be 0.5 km apart?
   (a) I and K
   (b) J and K
   (c) J and H
   (d) G and J

Directions for questions 20 to 23: *Read the following passage and solve the questions based on it.*

Mintu Babu lives in a smaller house than her brother. Mintu Babu lives in a larger house than her parents. Mintu Babu's children live with her. Mintu Babu has no other relatives.

20. If four females and two males live in a house smaller than Mintu Babu's brother, then, how many of Mintu Babu's children are boys and girls respectively?
   (a) 1, 0
   (b) 0, 1
   (c) 2, 1
   (d) 1, 2

21. If Mintu Babu's relative U lives in a larger house than her relative S, Then, all of the following may be true except
   (a) S is U's father
   (b) S is U's mother
   (c) U is younger to S
   (d) S is younger to U

22. Out of all the relatives of Mintu Babu who could possibly be either older or younger than her, none are the same age or older, then, how many of Mintu Babu's relatives must be younger than her?
   (a) Less than 2
   (b) 2
   (c) 3
   (d) More than 3

23. If the number of males related to Mintu Babu equals the number of females then which of the following can be true?
   (a) Mintu Babu has 4 children
   (b) Mintu Babu has 3 children
   (c) Mintu Babu has 1 child
   (d) Mintu Babu has 2 children

Directions for questions 24 and 25: *Read the following passage and solve the questions based on it.*

Three committees are formed from eight people, viz., F, G, H, I, J, K, L, and M. Two of the committees have three members and one of the committees has only two members. Certain other conditions are as follows:

  (i)   G serves with M
 (ii)   L serves with only one other person
(iii)   F does not serve with M

24. If K, J and I serve on different committees, which one of the following must be true?
   (a) K serves with G
   (b) I serves on a committee of two
   (c) I serves on a committee of three
   (d) H serves on a committee of two

25. Which of the following is inconsistent with the given conditions?
   (a) K serves with H
   (b) M serves with H
   (c) M, H and I serve together
   (d) F does not serve with G

HINTS AND EXPLANATIONS

1 to 6

From the given information:

Room	Country	Cars	Donations
101			
102			
103		12	8
104		(y)	> 4y
105		8	x − 2
106			

Here, the Brazil businessmen can stay in either room no. 105 or room no. 106. But from the options of the first question of the set, it must be 105. Let us fill the other data from it.

| Room	Country	Cars	Donations
101	Canada	–	y + 2
102	Uruguay	24	
103	England	12	8
104	Argentina	4	18
105	Brazil	8	y
106	Germany	16	24

1. The Brazilian businessman is staying in room number 105.

2. The Argentinean businessman donated to 18 institutions.

3. The German businessman is staying in room number 106.

4. The German businessman donated to 24 institutions.

5. From the given options, the businessman from Uruguay owns the maximum cars.

6. The businessman from England has 12 cars.

7. Using (I) if value of P = 40, then on two consecutive years 2001 and 2002, it has remained the same. This is only possible if the average in 2002 = 40.
Using (II) despite the value of P not given, we can find all the other things if A, B, C, D and E are given as equal. Hence, this statement is wrong and only I is true.

8. Using I, if the value of P = 40, then there are two possibilities for 2002. Either all the cars have been sold for 40 itself or no car has been sold. Hence, this statement is incorrect.
Using the given information in II we cannot find out. The average price of all the cars sold in 202.
Hence, none of the two statements is true.

9. We need all the unknowns to find the value.

10. Using the solution given for Q. 8, if P = 30 or P = 40 is given, we can find that either no car has been sold or all the cars have been sold at the same price. Still we have the total freedom to increase the number of cars sold in 2000 or 2004 etc. We should also not forget that using the average we cannot find out the number of articles involved.
Hence, this cannot be determined uniquely.

11. From the given options if P = 30, then in 2003 no car is sold.

12. The position will be like this:
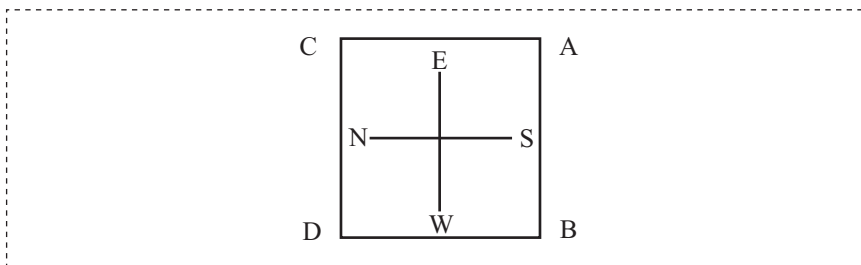
13. The position will be like this:
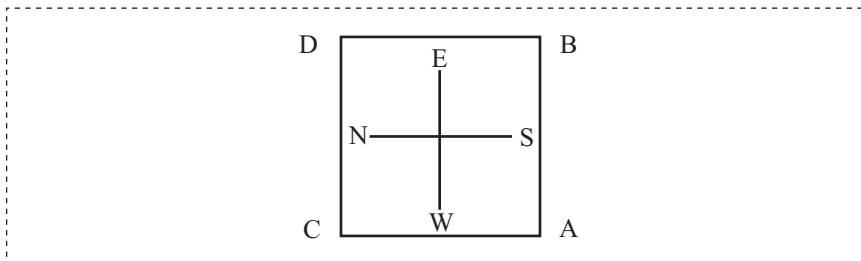
14. This is similar to the above question. B is now in north west direction.

15. By using the conditions (vi) & (vii) we can interpret that M is 1.5 km north of L. Correct option is (d).

16. B is 1 km west of A & so 1 km west of B is 2 km west of A. But D is 1 km west of E which is not at B but between B & C. So, D cannot be 2 km west of A. Correct option is (a).

17. B is 1 km west of A & C is 0.5 km west of A while D is 1 km west of E which is between B & C. So, D must be between 1.5 km & 2 km of A.

18. If E is 0.5 km east of B, then it may coincide with C as C is 0.5 km east of A. Correct option is (d).

19. In the given scenario, J & K will be 0.5 km apart of each other. Correct option is (b).

20 to 23

Mintu Babu's parents (1 M, 1 F) live in the smallest house.
Mintu Babu stays with her children in the medium house.
So, Mintu Babu's brother stays in the largest house.

20. Given that 4 females and 2 males live in smaller house, 3 females and 1 male stay in Mintu Babu's house.
Hence, Mintu Babu has 3 children (1 boy and 2 girls).

21. The only relatives of Mintu Babu are:
U, staying in the larger house, is her brother.
S, staying in the smaller house, is her father/mother.
Hence, the statement 'd' cannot be true.

22. There are 3 relatives of Mintu Babu, who must be younger than her.

23. From Q. 20, it is clear that Mintu Babu has 3 children.

24 to 25

24.

Committees	Two Members
K, G, M	I, L
J, F, H,	J, L
I, F, H	

25. Use the list of the people given above.