**1.6 MISCELLANEOUS**

**Introduction to the Topic**

There are certain kinds of questions which cannot be classified under the topics we have so far seen in Logical Reasoning. These questions are though being based on common logic but are different in form as compared to the questions seen so far. Some forms of the questions that can be classified under the miscellaneous questions are:

I. Routes or Networks

II. Puzzles

III. Division of items

IV. Binary logic (speaking truth and lying)

V. Finding minimum and maximum number of alternatives or ways

VI. Executing a set pattern or commands

And many more different kinds of questions.

**Relevance in CAT**

The questions of this topic as discussed are based on variety of logics; the occurrence of these questions in the CAT examination has not been regular. Sometimes these questions are simple and sometimes they may be slightly difficult as well. If you encounter these questions in the CAT examinations, then take a close look at them and decide whether the question is easy or difficult. If easy, the question should be answered as it will give you easy marks. If it’s a difficult question then you should move to some other set of LR.

**Practice Exercise – Easy**

1. Kamal, Hassan and Rajan have a Mercedes, a Audi and a BMW, and each boy has just one car. Among the following statements, only one is true and the other two are false.

I. Kamal has a Mercedes.

II. Hassan does not have the Mercedes.

III. Rajan does not have the Audi.

Who has the Mercedes?

a. Kamal b. Hassan

c. Rajan d. Cannot be determined

2. Chandan, Kaushik, Karthik and Subash were working part time book sellers. Their salary was directly related to the number of books they sold:

I. Karthik got less money than Subash.

II. Karthik and Subash together got the same amount as Chandan and Kaushik taken together.

III. Chandan and Subash together got less than Kaushik and Karthik taken together.

Who earned the most pocket money? Who sold the least number of books?

a. Kaushik, Karthik b. Kaushik, Chandan

c. Karthik, Subash d. Karthik, Chandan

**Directions (Q. Nos. 3 – 5):** Kya – Kya is an obscure island which is inhabited by two types of people: the ‘Yes’ type and the ‘No’ type. Native of type ‘Yes’ ask only questions the right answer to which is ‘Yes’ while those of type ‘No’ ask only questions the right answer to which is ‘No’.

For example: The ‘Yes’ type will ask questions like “Is 2 plus 2 equal to 4?” while the ‘No’ type will ask questions like “Is 2 plus 2 equal to five?” The following questions are based on your visit to the island of Kya – Kya.

3. If an islander asks, “Do I belong to the ‘No’ type”, which of the following is correct?

a. He is a ‘No’.

b. He is a ‘Yes’.

c. It is impossible for him to have asked such a question.

d. His type cannot be identified.

4. Ram and Laxman are brothers from the Island. Laxman asks you, “Is at least one of us brothers of type ‘No”? You can conclude that

a. Ram is ‘No’, Laxman is ‘Yes ‘.

b. Both are ‘Yes’.

c. Ram is ‘Yes’, Laxman is ‘No’.

d. Both are ‘No’.

5. You are approached by one of the islanders and asked, “Am I of type ‘Yes”? You can infer that

a. He was a ‘No’.

b. He was a ‘Yes’.

c. Such a situation is not possible.

d. No conclusion is possible.

6. You want to speak to the chief of the village. You question

three inhabitants. Amar, Bobby and Charles. Only Bobby’s

shirt is red. Who is the chief if each of them speak a truth and a lie (not in any order)?

I. Amar says. “I am not Bobby’s son. The chief wears a red shirt.”

II. Bobby says, “I am Amar’s father, Charles is the chief.”

III. Charles says, “The chief is one among us. I am the chief.”

a. Amar b. Bobby

c. Charles d. None of them

7. Amar, Akbar, and Anthony came from the same public school in the Himalayas. Every boy in that school either fishes for trout or plays Frisbee. All fishermen like snow while no Frisbee player likes rain. Amar dislikes whatever Akbar likes and likes whatever Akbar dislikes. Akbar likes rain and snow. Anthony likes whatever the other two like. Who is a fisherman but not a Frisbee player?

a. Amar b. Akbar c. Anthony d. None

**Directions (Q. Nos. 8 – 11):** The primitive tribes – folk of the island of Lexicophobos have recently developed a language for themselves, which has a very limited vocabulary. In fact, the words can be classified into only three types: The Bingoes, The Cingoes and The Dingoes.

The Bingoes type of words is: Grumbs, Harrumphs, Ihavitoo

The Cingoes type of words is: Ihavitoo, Jingongo, Koolodo

The Dingoes type of words is: Lovitoo, Metoo, Nana

They have also devised some rules of grammar:

I. Every sentence must have only five words.

II. Every sentence must have two Bingoes, one Cingo and two Dingoes.

III. If Grumbs is used in a sentence, Ihavitoo must also be used and vice versa.

IV. Koolodo can be used in a sentence only if Lovitoo is used.

8. Which choice of words in a sentence is not possible, if no rules of grammar are to be violated?

a. Grumbs and Harrumphs as the Bingoes and Ihavitoo as the Cingo.

b. Harrumphs and Ihavitoo as the Bingoes.

c. Grumbs and Ihavitoo as the Bingoes and Lovitoo and Nana as the Dingoes.

d. Metoo and Nana as the Dingoes.

9. If Grumbs and Harrumphs are the Bingoes in a sentence, and no rule of grammar is violated, which of the following is/are true?

I. Ihavitoo is the Cingo.

II. Lovitoo is the Dingo.

III. Either Lovitoo or Metoo must be one of – or both – the Dingoes.

a. I only b. II only

c. III only d. I & III only

10. Which of the following is a possible sentence if no grammar rule is violated?

a. Grumbs harrumphs ihavitoo lovitoo metoo.

b. Grumbs harrumphs ihavitoo jingongo lovitoo.

c. Harrumphs ihavitoo jingongo lovitoo metoo.

d. Grumbs ihavitoo koolodo metoo nana.

11. If in a sentence Grumps is the Bingo and no rule of grammar is violated, which of the following cannot be true?

a. Harrumphs must be a Bingo.

b. Ihavitoo must be a Bingo.

c. Lovitoo may be used.

d. All three Bingoes are used.

**Directions (Q. Nos. 12 – 15):** FIA the governing body of Formula 1 has devised some new rules for the pit stops being taken by driver during the 18 races being held each year.

1 chequered flags = turn right

2 chequered flags = turn left

3 chequered flags = stop

1 white flag = go at 10 miles per hour

2 white flags = go at 50 miles per hour

3 white flags = go at 80 miles per hour

Lewis Hamilton the leading driver of Mercedes Benz, was called a by FIA to test the new rules. He has to follow all the rules on a special pit stop arena; he starts the test by driving towards North.

FIA has directed the technician to show him the following sequence of flags:

Starting Grid – 1 white flag

After 30 minutes – 2 chequered and 2 white flags

After 15 minutes – 1 chequered flag

After 30 minutes – 1 chequered and 3 white flags

After 24 minutes – 2 chequered and 2 white flags

After 15 minutes – 3 chequered flags

12. The total distance travelled by the motorist from the starting point till the last signal is

a. 82.5 miles b. 87 miles

c. 92 miles d. 103.5 miles

13. Where is the final point with respect to the starting grid?

a. 32, South b. 42.25, East

c. 46.76, North-East d. 52.75, North

14. After the starting point if the sequence of flags shown is 2 white flags and 1 chequered flag and all other sequences being the same, what would be the final position of Hamilton with respect to the initial position?

a. 57.87, South b. 65.47, South-East

c. 71.29, East d. None of these

15. FIA decide to run the test in the opposite direction i.e. asking Hamilton to drive South while starting the test, what would be the final position with respect to the initial position?

a. South-West b. West

c. North-West d. North

**Directions (Q. Nos. 16 – 19):** *Select the correct alternative from the given choices.*

16. Seven towns C1, C2, C3, C4, C5, C6 and C7 are connected as follows. One-way phone lines without using hub in C5 are between C1 to C2 and C3; C2 to C3, C2 to C5 and C4; C4 to C5 and C6; C6 to C7; C5 to C7. Two-way phone lines without using hub in C5 are between C3 and C4 and between C5 and C6.

Total how many possibilities are there, if a person from town C1 wants to talk to a person in C7 not using any hub more than once?

a. 3 b. 6 c. 4 d. 5

17. Five cities – Delhi, Mumbai, Chennai, Kolkata and Bangalore – have some rail links subject to following restrictions. Delhi has a rail link to Mumbai, Chennai and Kolkata, all of have a rail link to Bangalore. Also, (Delhi and Bangalore), (Mumbai and Chennai) and (Chennai and Kolkata) have a rail link among each other. In how many different ways can a person from Delhi visit city Bangalore. (No city can be visited twice?)

a. 6 b. 8 c. 10 d. 12

18. There are eight countries – India, Pakistan, Bangladesh, Myanmar, Nepal, Bhutan, Afghanistan, Iran – which are connected by roads to each other, as described below:

(One-way routes): India to Pakistan, Bangladesh to Nepal, Afghanistan to Pakistan, Nepal to Bhutan, Myanmar to Pakistan, Pakistan to Bangladesh, India to Afghanistan, India to Iran.

(Tow-way routes): Afghanistan and Myanmar, Iran and Bhutan, Bangladesh and Myanmar, Bangladesh and Iran, Iran and Nepal. What is the total number of routes by which country Bhutan could be reached from India, such that no country is visited twice in any route?

a. 10 b. 19

c. 22 d. None of these

19. Eight cities C1, C2, C3, C4, C5, C6, C7 and C8 are connected with one-way and two-way roads as follows. One-way roads are from:

C2 to C3; C3 to C4; C5 to C1; C1 to C3; C5 to C7; C6 to C7; C6 to C4; C7 to C8; C8 to C6; C3 to C5.

Two-way roads are between C2 and C4; C5 and C6.

It takes 10 days to travel from one city to another using a one-ways road and it takes 5 day in case the cities are connected by a two-way road. What is the minimum number of days required by a man to go from C2 to C8 and return to C2, Passing through C5 both the times?

a. 65 b. 70

c. 75 d. None of these

**Practice Exercise – Medium**

**Directions (Q. Nos. 1 – 3):** The following questions relate to a game to be played by you and your friend. The game consists of a 4 x 4 board (see below) where each cell contains a positive integer. You and your friend make moves alternately. A move by any of the players consists of splitting the current board configuration into two equal halves and retaining one of them. In your moves you are allowed to split the board only vertically and to decide to retain either the left or the right half. Your friend, in his/her moves, can split the board only horizontally and can retain either the lower or the upper half. After two moves by each player a single cell will remain which can no longer be split and the number in that cell will be treated as the gain (in rupees) of the person who has started the game. A sample game is shown below.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 1 | 2 | 4 |  | 2 | 1 |  |  |  | 2 | 1 |  |  |
| 5 | 1 | 6 | 7 |  | 5 | 1 |  |  |  | 5 | 1 |  |  |
| 9 | 1 | 3 | 2 |  | 9 | 1 |  |  |  |  |  |  |  |
| 6 | 1 | 8 | 4 |  | 6 | 1 |  |  |  |  |  |  |  |
| Initial  Board | | | |  | After your move (Retain left) | | | |  | After friends move (Retain upper) | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 |  |  |  |  |  |  |  |
|  | 1 |  |  |  |  | 1 |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| After your move (Retain right) | | | |  | After friends move (Retain lower) | | | |

So your gain is Re.1. With the same initial board configuration as above and assuming that you have to make the first move, answer the following questions.

1. If you choose (retain right) (retain left) in your turns, the best move sequence for your friend to reduce your gain to a minimum will be

a. (retain upper)(retain lower)

b. (retain lower) (retain upper)

c. (retain upper) (retain upper)

d. (retain lower) (retain lower)

2. If both of you select your moves intelligently then at the end of the game your gain will be

a. Rs.4 b. Rs.3

c. Rs.2 d. None of these

3. If your first move is (retain right), then whatever moves your friend may select you can always force a gain of no less than

a. Rs.3 b. Rs.6

c. Rs.4 d. None of these

**Directions (Q. Nos. 4 – 5):** The Weirdo Holiday Resort follows a particular system of holidays for its employees. People are given holidays on the days where the first letter of the day of the week is the same as the first letter of their names. All employees work at the same rate.

4. Raja starts working on February 25, 1996, and finishes the job on March 2, 1996. How much time would T and J take to finish the same job if both start on the same day as Raja?

a. 4 days b. 5 days

c. Either (a) or (b) d. Cannot be determined

5. Starting on February 25, 1996, if Raja had finished his job on April 2, 1996, when would T and S together likely to have completed the job, had they started on the same day as Raja?

a. March 15, 1996 b. March 14, 1996

c. March 22, 1996 d. Data insufficient

**Directions (Q. Nos. 6 – 7):** Amar, Akbar and Anthony are three friends. Only three colours are available for their shirts, viz. red, green and blue. Amar does not wear red shirt. Akbar does not wear green shirt. Anthony does not wear blue shirt.

6. If Akbar and Anthony wear the same colour of shirts, then which of the following is not true?

a. a. Amar wears blue and Akbar wears green

b. b. Amar wears green and Akbar wears red

c. c. Amar wears blue and Akbar does not wear blue

d. d. Anthony wears red

7. If two of them wear the same colour, then how many of the following must be false?

I. Amar wears blue and Akbar does not wear green

II. Amar does not wear blue and Akbar wears blue

III. Amar does not wear blue and Akbar does not wear blue

IV. Amar wears green, Akbar does not wear red, Anthony does not wear green

a. None b. One c. Two d. Three

8. A, B, C, D, ..., X, Y, Z are the players who participated in a tournament. Everyone played with every other player exactly once. A win scores 2 points, a draw scores 1 point and a loss scores 0 point. None of the matches ended in a draw. No two players scored the same score. At the end of the tournament, a ranking list is published which is in accordance with the alphabetical order. Then

a. M wins over N b. N wins over M

c. M does not play with N d. None of these

9. Three labeled boxes containing red and white cricket balls are all mislabeled. It is known that one of the boxes contains only white balls and another one contains only red balls. The third contains a mixture of red and white balls. You are required to correctly label the boxes with the labels red, white and red and white by picking a sample of one ball from only one box. What is the label on the box you should sample?

a. White b. Red c. Red and White d. Not possible to determine from a sample of one ball

**Directions (Q. Nos. 10 – 12):** A young girl Roopa leaves home with x flowers, goes to the bank of a nearby river. On the bank of the river, there are four places of worship, standing in a row. She dips all the x flowers into the river. The number of flowers doubles. Then she enters the first place of worship, offers y flowers to the deity. She dips the remaining flowers into the river, and again the number of flowers doubles. She goes to the second place of worship, offers y flowers to the deity. She dips the remaining flowers into the river, and again the number of flowers doubles. She goes to the third place of worship, offers y flowers to the deity. She dips the remaining flowers into the river, and again the number of flowers doubles. She goes to the fourth place of worship, offers y flowers to the deity. Now she is left with no flowers in hand.

10. If Roopa leaves home with 30 flowers, the number of flowers she offers to each deity is

a. 30 b. 31 c. 32 d. 33

11. The minimum number of flowers that could be offered to each deity is

a. 0 b. 15

c. 16 d. Cannot be determined

12. The minimum number of flowers with which Roopa leaves home is

a. 16 b. 15

c. 0 d. Cannot be determined

13. Brendon McCullum played 10 balls in the match against England and no ball was left alone by him. He played different shots and has played atleast one shot each out of cover drive, pull shot, square drive and cut shot. For every cover drive he hit he must have hit 2 or more cut shots, and for every pull shot that he hit he must have hit 2 or more square drives. McCullum scored 4, 3, 2 and 1 runs on each cover drive, pull shot, square drive and cut shot respectively. The maximum runs that McCullum could have scored are?

a. 20 b. 21 c. 22 d. 23

14. One day a theft occurred in Lalit’s office. He logged a complaint about the theft with the local police station. Inspector Jatin was handed over the case. He came for the investigation and investigated employees of 3 other offices on the same floor. As Lalit is a rude man, the employees don’t want to offer any help for Lalit. So, they gave their statements but each of them spoke a truth and a lie. Each of them made a statement which contained one truth and one lie.

I. Employee of 902 said: “The thief had long legs and had a fair complexion”

II. Employee of 903 said: “The thief had wheatish complexion and wore a cap”

III. Employee of 904 said: “The thief had short legs and he didn’t wear a cap”

Based on the above statements, which of the following could be a correct description?

a. The thief had short legs, wheatish complexion and did not wear a cap

b. The thief had short legs, fair complexion and wear a cap

c. The thief had long legs, fair complexion and wear a cap

d. The thief had long legs, fair complexion and did not wear a cap

**Directions (Q. Nos. 15 – 16):** *Answer the questions on the basis of the information given below.*

2 robot prototypes have been developed: P1 and P2. P1 will always speak the fact as it is, while P2 speaks opposite of the fact. One is named is Jack and other is Paul.

15. Jack says, “I always lie.” Based on this statement, which of the following options is TRUE?

a. Jack is an inhabitant of P1.

b. Jack is an inhabitant of P2.

c. It cannot be determined as to which type of inhabitant is Jack.

d. This is an impossible statement.

16. Paul says, “Jack always speaks the truth.” Which of the following statements is definitely TRUE?

I. Paul is an inhabitant of P1.

II. Paul is an inhabitant of P2.

III. Paul and Jack are inhabitants of the opposite type.

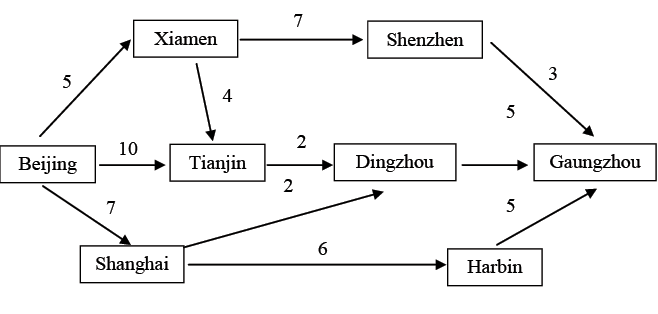
IV. Paul and Jack are inhabitants of the same type.

a. Only I b. Only II

c. I, II and III d. Only IV

**Directions (Q. Nos. 17 – 21):** *These questions are based on the following information.*

A one-way railways network is given from Beijing to Gaungzhou is given below, where arrows represent the direction in which the trains can travel between two cities. The number on the arrow represents the time in hours required to travel the length.



The trains are allowed to travel in any route. The commuter will take the train, which takes least time to travel from Beijing to Gaungzhou. The railway network authority can control the train traffic by increasing or decreasing the halting time at the cities. Xiamen, Tianjin, Shanghai, Shenzhen, Dingzhou and Harbin are the cities in between Beijing and Gaungzhou.

17. If the halting time at any city is the same, then what is the first city that a commuter will reach?

a. Xiamen b. Tianjin

c. Shanghai d. Either (a) or (b)

18. If the network between Xiamen and Shenzhen is under repair, how the authority can change the halting time (in minutes) at the cities Xiamen, Tianjin, Shanghai, Dingzhau and Harbin to ensure that the traffic is same in all routes?

a. 1, 0, 3, 4, 0 b. 1, 1, 4, 5, 0

c. 1, 1, 4, 3, 1 d. 1, 0, 5, 6, 1

19. What can be the halting time (in minutes) at Xiamen, Tianjin, Shanghai, Shenzhen, Dingzhou and Harbin made by the authority to ensure that equal number of commuters will travel through Beijing → Xiamen, Beijing → Tianjin and Beijing → Shanghai?

a. 2, 1, 4, 2, 1, 1 b. 2, 1, 1, 2, 1, 1

c. 1, 0, 2, 1, 0, 0 d. 1, 0, 2, 4, 0, 3

20. To ensure the flow of commuter along any route the same, what should be the halting time (in minutes) at Xiamen, Tianjin, Shanghai, Shenzhen, Dingzhou and Harbin respectively?

a. 1, 0, 3, 6, 4, 0 b. 1, 2, 3, 5, 7, 1

c. 1, 1, 4, 7, 5, 1 d. 1, 1, 3, 6, 4, 1

21. If the halting time at any of the cities – Xiamen, Tianjin, Shanghai, Shenzhen, Dingzhou and Harbin is exactly one minute more than the halting time at the immediately previous city (the halting time at Beijing is considered to be zero minutes) of the specified route, then which of the following pairs of routes has a travel time difference of exactly three minutes?

a. Beijing → Xiamen → Shenzhen → Gaungzhou and Beijing → Shanghai → Harbin → Gaungzhou

b. Beijing → Shanghai → Harbin → Gaungzhou and Beijing → Xiamen → Tianjin → Dingzhou → Gaungzhou

c. Beijing → Xiamen → Tianjin → Dingzhou → Gaungzhou and Beijing → Shanghai → Dingzhou → Gaungzhou

d. Beijing → Shanghai → Dingzhou → Gaungzhou and Beijing → Xiamen → Shenzhen → Gaungzhou

**Directions (Q. Nos. 22 – 24):** *These questions are based on the data given below.*

Three persons –P1, P2 and P3 – gave one statement each. There is one person who speaks the truth, one who tells lies and another whose statement cannot be classified as either true or false. Following are the statements made by them:

P1: I speak truth.

P3: I don’t speak truth.

P2: I neither speak the truth nor do I lie.

22. What is the name of the person whose statement can be classified as neither true nor as false?

a. P1 b. P3

c. P2 d. Cannot be determined

23. Who tells lies?

a. P3 b. P1

c. P2 d. Cannot be determined

24. What is the nature of the statement given by P1?

a. True

b. False

c. Cannot be classified as true or false

d. Cannot be determined

**Directions (Q. Nos. 25 – 28):** *These questions are based on the data given below.*

A manufacturing unit has many spindles which can manufacture clothes of different color, texture and size. Whenever a spindle is turned on it is turned on for a period of 90 minutes. After the completion of 90 minutes for any spindle it is stopped and new spindles comes into operation. The factory starts its operation at 10:00 am in the morning. Ram, the supervisor has a record of number of spindles running on different point of times of the day. According to Ram’s records there were 20, 25, 30, S, 20, 15, 25, 20, 25 and 20 spindles working at 10:00 am, 10:30 am,11:00 am, 11:30 am, 12:00 pm, 12:30 pm, 1:00 pm, 1:30 pm, 2:00 pm and 2:30 pm respectively.

25. What can be the maximum number of spindles that started working at 11:30 am?

a. 10 b. 15

c. 20 d. Cannot be determined

26. If the number of spindles working at 11:30 am is 20, then how many new spindles started working at 12 pm?

a. 5 b. 10 c. 15 d. 20

27. At 2:30 pm apart from the given spindles an additional 10 spindles were forced into action due to an urgent order. If 15% of the total spindles are working now, what is the total number of spindles in the factor?

a. 100 b. 150 c. 200 d. 300

28. At 10:30 am, how many additional spindles were turned on? (Apart from those already working since 10:00 am)

a. 5 b. 10 c. 15 d. 20

**Practice Exercise – Difficult**

**Directions (Q. Nos. 1 – 4):** The pages of a book are numbered 0, 1, 2, …….M; M > 0. There are four categories of instructions that direct a person in positioning the book at a page. The instruction types and their meanings are:

I. OPEN: Position the book at page No. 1

II. CLOSE: Position the book at page No. 0

III. FORWARD, n: From the current page move forward by n pages; if, in this process, page number M is reached, stop at M.

IV. BACKWARD, n: From the current page, move backward by n pages; if in this process, page number 0 is reached, stop at page number 0.

In each of the following questions, you will find a sequence of instructions formed from the above categories. In each case, let n1 be the page number before the instructions are executed and n2 be the page number at which the book is positioned after the instructions are executed.

1. FORWARD, 25; BACKWARD, 10. Which of the following statements is true?

a. n1 = n2 if M = 10 and n1 = 0

b. M = 20 provided n1 > 0

c. n1 > 30 provided M = 900

d. n1 = 37 provided M = 25

2. BACKWARD, 5; FORWARD, 5. Which of the following statements is true about the above set of instructions?

a. n1 = n2 provided n1 ≥ 5 b. n1 = n2 provided n1 > 0

c. n2 = 5 provided M > 0 d. n1 > n2 provided M > 0

3. FORWARD, 10; FORWARD, 10. Which of the following statements about the above instructions is true?

a. n2 – n1 = 20 only if n1 = 0

b. n2 – n1 = 20 if M > 20 and n1 = 1

c. n2 – n1 = 10 if M = 21 and n1 = 0

d. n2 > n1 if M > 0

4. FORWARD, 5; BACKWARD, 4. Which of the following statements about the above instructions is true?

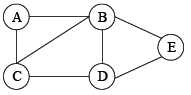
a. n2 = n1 + 4 provided 1 < n1 < 7

b. n2 = n1 provided M < 6

c. n2 = n1 + 1 provided M – n1 > 5

d. n2 – n1 < 0 provided M > 0

**Directions (Q. Nos. 5 – 6):** *There are 5 cities, A, B, C, D and E connected by 7 roads as shown in the figure below:*



Design a route such that you start from any city of your choice and walk on each of the 7 roads once and only once, not necessarily returning to the city from which you started.

5. For a route that satisfies the above restrictions, which of the following statements is true?

a. There is no route that satisfies the above restriction.

b. A route can either start at C or end at C, but not both.

c. D can be only an intermediate city in the route.

d. The route has to necessarily end at E.

6. How many different starting cities are possible such that the above restriction is satisfied?

a. One b. Zero c. Three d. Two

**Directions (Q. Nos. 7 – 10):** Swetha, Swarna, Sneha and Soumya are four sisters who have an agreement that they share all snacks equally among themselves. One day, uncle Prem gave a box of cookies to Swetha. Since the other sisters were not around, Swetha divided the cookies into four parts, ate her share and put the rest into the box. As she was closing the box, Swarna came in; she took all the cookies from the box and divided them into four equal parts. Swetha and Swarna ate one part each and put the rest into the box. Just then Sneha walked in. She took all the cookies from the box, divided them into four equal parts. The three of them ate their respective shares and put the rest into the box. Later, when Soumya came, she divided all the cookies into four equal parts and all the four sisters ate their respective shares. In total, Soumya ate 3 cookies.

7. How many cookies, in total, did Sneha eat?

a. 30 b. 12 c. 15 d. 6

8. How many cookies did uncle Prem give to Swetha?

a. 128 b. 156 c. 256 d. 192

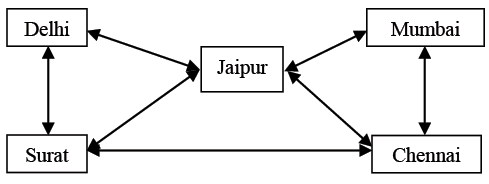
9. How many cookies, in total, did Swetha eat?

a. 32 b. 142 c. 72 d. 71

10. How many cookies, in total, did Swarna eat?

a. 9 b. 30 c. 39 d. 78

**Directions (Q. Nos. 11 – 12):** *The diagram below shows the possible air routes between 5 metropolitan cities in India.*



5 airlines are planning to start flights between the two cities on Monday and Tuesday, with each airlines starting exactly one flight. The Air Traffic Control Authority of India has received the plans from all the 5 airlines about the planned routes.

Two days (Thursday and Friday) are left for campaigning before a major election, and the city administration has received requests from five political parties for taking out their processions along the following routes.

I. Spice: Delhi – Jaipur – Chennai – Mumbai

II. Indigo: Delhi – Surat – Chennai – Mumbai

III. GO: Delhi – Surat – Jaipur – Mumbai

IV. Air India: Surat – Jaipur – Mumbai

V. Deccan: Delhi – Jaipur – Chennai

Additional flight cannot be started including the route from Surat to Chennai on Monday as these airports and the air route is already working more than its capacity. Also, the Air Traffic control doesn’t want to introduce two flights on a particular route in one day and they also want all the 5 airlines to launch their routes.

11. Spice can be allowed to start its route on:

a. Only Monday

b. Only Tuesday

c. Either Monday or Tuesday

d. Only if additional load is allowed on Surat – Chennai route.

12. Which of the following is NOT true?

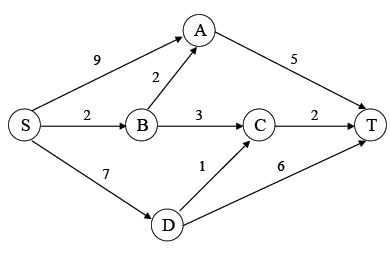
a. Spice and GO can start the route on the same day.

b. The route of Deccan cannot be allowed on Monday.

c. The route of Indigo can be allowed only on Tuesday.

d. Spice and Air India can start their routes on the same day.

**Directions (Q. Nos. 13 – 17):** A significant amount of traffic flows from point S to point T in the one-way street network shown below. Points A, B, C, and D are junctions in the network, and the arrows mark the direction of traffic flow. The fuel cost in rupees for travelling along a street is indicated by the number adjacent to the arrow representing the street.



Motorists travelling from point S to point T would obviously take the route for which the total cost of travelling is the minimum. If two or more routes have the same least travel cost, then motorists are indifferent between them. Hence, the traffic gets evenly distributed among all the least cost routes. The government can control the flow of traffic only by levying appropriate toll at each junction. For example, if a motorist takes the route S-A-T (using junction A alone), then the total cost of travel would be Rs. 14 (i.e. Rs 9 + Rs 5) plus the toll charged at junction A. **[CAT 2006]**

13. If the government wants to ensure that no traffic flows on the street from D to T, while equal amount of traffic flows through junctions A and C, then a feasible set of toll charged (in rupees) at junctions A, B, C, and D respectively to achieve this goal is:

a. 1, 5, 3, 3 b. 1, 4, 4, 3 c. 1, 5, 4, 2 d. 0, 5, 2, 2

14. If the government wants to ensure that all motorists travelling from S to T pay the same amount (fuel costs and toll combined) regardless of the route they choose and the street from B to C is under repairs (and hence unusable), then a feasible set of toll charged (in rupees) at junctions A, B, C, and D respectively to achieve this goal is:

a. 2, 5, 3, 2 b. 0, 6, 3, 1 c. 1, 5, 3, 2 d. 2, 3, 5, 1

15. If the government wants to ensure that the traffic at S gets evenly distributed along streets from S to A, from S to B, and from S to D, then a feasible set of toll charged (in rupees) at junctions A, B, C, and D respectively to achieve this goal is:

a. 0, 5, 4, 1 b. 0, 5, 2, 2 c. 1, 5, 3, 3 d. 1, 4, 3, 2

16. If the government wants to ensure that all routes from S to T get the same amount of traffic, then a feasible set of toll charged (in rupees) at junctions A, B, C, and D respectively to achieve this goal is:

a. 0, 5, 2, 2 b. 0, 5, 4, 1 c. 1, 5, 3, 3 d. 1, 5, 3, 2

17. The government wants to devise a toll policy such that the total cost to the commuters per trip is minimized. The policy should also ensure that not more than 70 per cent of the total traffic passes through junction B. The cost incurred by the commuter travelling from point S to point T under this policy will be:

a. Rs. 7 b. Rs. 9 c. Rs. 10 d. Rs. 14

**Directions (Q. Nos. 18 – 20):** *Answer the questions on the basis of the information given below.*

There are 10 boxes each of the boxes contain 10 balls each. All the balls in each box weigh 10 grams, but there is a box in which balls are defected and all the balls of the box of that box doesn’t weigh 10 grams. You are provided with an electronic balance to find the box with defected balls?

18. What will be the minimum number of weighing’s required to find the box with defected balls if the defected balls weigh 9 grams each?

a. 1 b. 2

c. 3 d. More than 3

19. What will be the minimum number of weighing’s required to find the box with defected balls if the defected balls weigh 11 grams each?

a. 1 b. 2

c. 3 d. More than 3

20. What will be the minimum number of weighing’s required to find the box with defected balls if the defected balls weigh either 9 or 11 grams each (all defected balls will have the same weight)?

a. 1 b. 2

c. 3 d. More than 3

**Directions (Q. Nos. 21 – 23):** *These questions are based on the data given below.*

In the recently concluded Asian Games, 3 Indian shooters won gold, silver and bronze medals in the 50 m Air pistol event. The 3 shooters viz. Jaspal, Narang and Bindra made few statements about their positions.

Jaspal: Bindra has won Gold. Narang has won Silver.

Narang: Jaspal has won Bronze. Bindra has not won Silver.

Bindra: Narang has won Silver. I have won Bronze.

It was known that exactly one amongst them has won bronze, another has won silver and the third has won gold. It was also known that each of them made at least one true statement.

21. Who has won Silver?

a. Jaspal b. Narang

c. Bindra d. Cannot be determined

22. Which medal has Jaspal won?

a. Gold b. Bronze

c. Silver d. Cannot be determined

23. Which of the following statements can never be true?

a. Each of Jaspal and Narang always spoke the truth.

b. Each of Jaspal and Narang spoke one truth and one lie.

c. Bindra always spoke the truth.

d. The first statement given by each person was always false.

**Directions (Q. Nos. 24 – 26):** *These questions are based on the data given below.*

There are 9 balls made up of iron out of which 1 is defected. All balls have the same weight of 10 grams each but the defected ball is not equal to 10 grams. You have a pan balance available with you to check and find the defected ball.

24. What will be minimum number of weighing’s required to find the defected ball if the defected ball weights 9 grams?

a. 1 b. 2

c. 3 d. More than 3

25. What will be minimum number of weighing’s required to find the defected ball if the defected ball weights 11 grams?

a. 1 b. 2

c. 3 d. More than 3

26. What will be minimum number of weighing’s required to find the defected ball if the defect in the ball (heavy or light) is not known?

a. 1 b. 2

c. 3 d. More than 3

**Directions (Q. Nos. 27 – 30):** *These questions are based on the data given below.*

Sunitha has some bags filled with balls. There are 4 bags each of them contain 12 red balls, 3 bags each of them contain 18 green balls, 2 bags each of them containing 25 blue balls, 5 bags each containing 9 yellow balls and 5 bags each containing 7 white balls. The content of all these bags are emptied into a cardboard box. Sunitha picks out some balls blindfolded from this box.

27. How many balls must Sunitha pick to be sure of having picked atleast one ball from each of the bags?

a. 183 b. 208 c. 214 d. 228

28. How many balls must Sunitha pick to be sure of having picked atleast one ball of each colour?

a. 183 b. 208 c. 214 d. 228

29. How many balls must Sunitha pick to be sure of having picked all the balls of one of the bags?

a. 183 b. 208 c. 214 d. 228

30. How many balls must Sunitha pick to be sure of having picked all the balls of one of the colours?

a. 183 b. 208 c. 214 d. 228

**Directions (Q. Nos. 31 – 34):** *These questions are based on the data given below.*

On the planet Xartha, the inhabitants use a base system of 3 in which the digits are 0, 1 and 2. They have a peculiar way of righting the counting following by 4 different logics viz.

I. Logic 1: If a number ends with 0, then a new number can be formed by adding 1 at the end.

II. Logic 2: If 2n is a number then 2nn is also a number.

III. Logic 3: If a number contains 000 then it can be written as 1 instead of 000.

IV. Logic 4: If 00 occurs in any number, then it can be removed from the number.

If 20 is a number then:

I. 200 is also a number – Logic 2

II. 20000 is also a number – Logic 2

III. 210 is also a number – Logic 3

IV. 2101 is also a number – Logic 1

V. 2101101 is also a number – Logic 2

Now answer the questions based on the above logics.

31. The minimum number of steps required to construct 21100 is

a. 3 b. 4 c. 5 d. 6

32. The minimum number of steps required to construct 11 from 20 is

a. 3 b. 4

c. 8 d. Number is not possible

33. The minimum number of steps required to construct 21110 is

a. 8 b. 10 c. 11 d. 12

34. Out of 211, 201, 210, 200 and 12, how many can be created from 20?

a. 2 b. 3 c. 4 d. 5