CHAPTER-6

BINARY LOGIC

In some of the competitive exams, we come across questions which are to be answered based on the truth or falsity of statements given in the question. In these questions we come across three kinds of terms. They are 'Truth-Teller', 'Liar' and 'Alternator'. These terms may or may not be explicitly defined in the question. The following are the definitions of these terms, which can be applied while answering these questions, unless otherwise

Truth-teller: A person whose each and every statement is true.

Liar: A person whose each and every statement is false.

Alternator: If first statement of the person is true, the next statement is false or vice versa.

The question does not specify as to which statement is true or false. It has to be found out by trial and error and by checking for consistency in the given statement. The following illustration helps in understanding the concept.

Example: Among the three persons A, B and C, one is a truth-teller, one is a liar and the other is an alternator. Each of them made the following statements in reply to the question asked about them.

A: I am not the liar. C is the liar.

B: I am the liar. A is the truth-teller.

C: I am the alternator. B is the liar.

Solution: The statement, 'I am not the liar', could be that

four statements made by each person.

Exercise - 6(a)

Directions for question 1: Select the correct alternative from the given choices.

1. The inspector of police, Chulbul Pandey is questioning five suspects – Sheroo, Santhosh, Bhayankar, Chola, and Bhala about a bank robbery. They made the following statements.

Bhyankar robbed the bank. Sheroo:

Sheroo did not rob the bank. Santhosh: Santhosh is telling the truth. Bhayankar:

Sheroo is telling the truth. Chola:

Exactly one of us is telling the truth. Bhala: Chulbul Pandey just received evidence that Bhala is telling the truth. Then which of these statement is true?

- (A) Sheroo robbed the bank.
- (B) Bhayankar is telling the truth.
- (C) Both Santhosh and Chola robbed the bank.
 - (D) Sheroo did not rob the bank.

Directions for questions 2 to 4: These questions are based on the following information:

A person who always speaks the truth. Truth-teller

> A person who always lies. Liar

A person who alternates between truth Alternator

and lie, in any order.

- Who among the above three kinds of person can make the following statement - "I am not an alternator"?"
 - (A) A truth-teller (B) A liar

(C) An alternator

(D) Cannot be determined

Find out who the truth-teller is who the liar is and who the alternator is

of a truth-teller or of a liar or of an alternator. Hence, we cannot find out the nature of A. From the statement of B i.e, 'I am a liar', it can be concluded that B is the alternator, because neither a truth-teller nor a liar would say that he is a liar. Hence the second statement of B, i.e, 'A is the truthteller' is true. From the above, it can be concluded that the statement of C i.e., I am the alternator is false. Hence, C is the liar. Let us check the truth in each of the statements of A, B and C with the help of the conclusions made.

- A: I am not the liar (True). C is the liar (True).
- B: I am the liar (False). A is the truth teller (True).
- C: I am the alternator (False). B is the liar (False). From the above, it is clear that the conclusions made i.e., A is the truth teller (both the statements are true), B is the alternator (one statement is true and the other is false) and C is the liar (both the statements false), are correct. The questions asked may have one, two, three or even

Who among the above three kinds of person can make the following statement - "I am not a truth-teller?"

- (A) A truth-teller
- (B) A truth-teller or a liar
- (C) A liar or an alternator
 - (D) An alternator

Who among the above three kinds of persons can make the following statement - "I am a truth-teller?"

- A truth-teller
 - A liar .II
- III. An alternator

(B) Only I and III (A) Only I

(D) Any one of I, II, III (C) Only II and III

Directions for questions 5 to 7: Select the correct alternative from the given choices.

On 'Kya-Kya' island, there are two tribes - Truthtellers and Liars. Truth-tellers always speak the truth and Liars always lie. One day I met three Kya-Kya islanders A, B and C, and asked them 'Who among you is the truth-teller?' Following were their replies.

A: I am not a Liar.

O (O)

B: C is not a Liar.

C: B is a Truth-teller.

If it was known that exactly one person among the three was a Truth-teller and the other two were Liars, then who among them must be the Truth-teller?

> (B) B A (A)

(D) Cannot be determined

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One day I met three persons Anand, Bharat and Chandu each of whom belonged to a different tribe amongst Truth-tellers, Liars and Alternators. When asked to introduce themselves, each of them gave two replies, as given below. Also, it is known that the Truth-tellers always speak truth, the Liars always lie and the Alternators alternate between truth and lie, in any order. Anand: I am the Truth-teller. Bharat is the Liar.

Bharat: I am not the Liar. Chandu is the Truth-teller. Chandu: I am not the Liar. Anand is not the Truth-teller. Who among these three persons is the Alternator?

(B) Bharat (A) Anand

(D) Cannot be determined (C) Chandu

Three Players - Aalu, Kachaalu and Bhalu-were 7. playing poker and suddenly started to quarrel among themselves - blaming each other for cheating. It was found out that at least one person among the three cheated. When they were asked who cheated, their replies were as follows:

I did not cheat. Aalu:

Kachaalu cheated.

I did not cheat. Kachaalu:

Both Aalu and Bhalu cheated.

I did not cheat. Bhalu:

Only Kachaalu did not cheat. If exactly one person among them always spoke

truth, another always lied and the third alternated between the truth and lie, then which of the following statements can never be true in any case?

(A) Only Aalu and Bhalu cheated.

(B) Only Aalu and Bhalu did not cheat.

(C) Bhalu always spoke the truth.

(D) Bhalu alternated between truth and lie.

Directions for questions 8 to 10: These questions are based on the following information.

Three persons – Mohit, Nitin and Jayesh – 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:

> I am not a liar. Mohit I am a Liar. Jayesh

I neither speak the truth nor do I lie. Nitin

- What is the name of the person whose statement can be classified as neither true nor as false?
 - (B) Jayesh (A) Mohit

(D) Cannot be determined (C) Nitin

> Who tells lies? 9.

(B) Mohit (A) Jayesh

(D) Cannot be determined (C) Nitin

- 10. What is the nature of the statement given by Mohit?
 - (A) True (B) False
 - (C) Cannot be classified as true or false
 - (D) Cannot be determined

Directions for questions 11 to 13: These questions are based on the following information.

Twelve coins were distributed among A, B and C, who always gave two replies to any question. When asked about the distribution of coins, following were their replies:

- A: I got 4 coins. C did not get the least number of coins. B: I got the least. A got the most.

 - C: A got the least. B got 4 coins.

Each person received at least one coin. Also, it was known that one person among them always spoke the truth, another always tells lies and the third person alternates between the truth and lie, in any order.

11. If each of them received equal number of coins, then who among them always tells lies?

(B) B

(D) Cannot be determined O(O)

12. If the coins were distributed as 3, 4 and 5, then who can never get three coins?

(B) B (D) Cannot be determined

13. If the coins were distributed as 1, 2, and 9 then who got the least number of coins?

A (A)

(D) Cannot be determined

Directions for questions 14 to 16: Select the correct alternative from the given choices.

14. Sameer, Sameep and Sumer participated in a quiz contest and each one of them received exactly one title amongst the Winner, the First Runner-up and the Second Runner-up. When asked, "Who among you three is the winner?", following were their replies:

I am the winner. Sameer:

Sameep is not the 1st Runner-up.

I am the winner. Sameep:

Sameer is the 2nd runner up.

I am the winner. Sumer:

Sameep is the 2nd runner-up.

It is also known that one among them always tells the truth, one always lies and one alternates between the truth and lie (not necessarily in that order). Who can never be the first runner-up?

(B) Sameep (A) Sameer

(C) Sumer

(D) Cannot be determined

15. Each person out of A, B and C had exactly one different title amongst the Good, the Bad and the Ugly. Also, each person always gave two answers to any question. Exactly one among them always spoke the truth, another always lied and the last person always alternates between truth and lie (in any order). When asked about their titles, following were their replies:

B is 'the Good'.

I am 'the Ugly'.

C is 'the Bad' : B

A is not 'the Good'.

B is 'the Ugly'. : ၁

A is not 'the Bad'.

Which among the following choices has the names of the persons who had the title the Good, the Bad and the Ugly, respectively?

(B) C, A, B (A) A, B, C

(D) A, C, B (C) B, C, A

16. John, Johny and Janardan participated in a race and each won a different medal among Gold, Silver and Bronze, not necessarily in that order. Each person among them gives two replies to any question, one of which is true and the other is false (in any order). When asked about the details of the medals obtained by them, the following were their replies:

I won the Gold medal.

Johny won the Bronze medal

John won the Silver medal Johny:

I won the Gold medal.

Johny won the Silver medal. Janardan:

I won the Gold medal.

Which among the following is the correct order of the persons who won the Gold medal, the Silver medal and the Bronze medal respectively?

- (A) John, Johny, Janardan
- (B) Janardan, John, Johny
- (C) Johny, Janardan, John
- (D) Janardan, Johny, John

Directions for questions 17 to 19: These questions are based on the following information.

Each of the three persons - Ramu, Raman and Rajanbelonged to exactly one of different cities amongst Delhi, Mumbai and Chennai. Each person always gives two replies to any question asked. Out of these three, exactly one person always speaks the truth, other always lies and the another always alternates between truth and lie, in any order. When each was asked "Which city do you belong to?". the following were their replies:

Ramu: I am from Delhi. Raman is from Mumbai. Raman: I am from Delhi. Rajan is from Chennai. Rajan: Ramu is from Mumbai. Raman is from Delhi. Based on the above, answer the following questions.

- 17. Who among the three must be from Chennai?
 - (B) Raman (A) Ramu
- (D) Cannot be determined (C) Rajan
 - 18. Which city did Raman belong to?
 - (B) Mumbai (A) Delhi
 - (D) Chennai or Delhi (C) Chennai
- 19. If there are exactly two persons who always tell the truth, and the third person either always lies or alternates between truth and lie, then which of the following statements must be false?
 - (A) Rajan is not from Mumbai.
 - (B) Ramu is not from Delhi.
 - (C) Rajan is not from Chennai.
 - (D) Raman is from Delhi.

Directions for questions 20 to 22: These questions are based on the data given below.

To save our solar system from the attacks of the ETs from other galaxies, the representatives of all nine planets gathered at the 'Galaxy Hall' for a meeting. While entering the Hall, each alien (representative of each planet) had to show his ID card to Mr. Gurkha-the gatekeeper. But three aliens-Eena. Meena and Deeka forgot their ID cards at the hotel. When asked, who represented which planet, the following were their replies.

Eena: Deeka is from Mars. Meena is from Saturn.

Meena: Eena is from Jupiter. Deeka is not from Saturn. Deeka: Meena is from Saturn. I am from Jupiter.

It was known that exactly one amongst them belonged to the planet Jupiter, another belonged to the planet Saturn and the third belonged to the planet Mars. It was also known that each of them made at least one true statement.

- 20. Who must be from Saturn?
- (B) Meena (A) Eena (C) Deeka
- (D) Cannot be determined

- 21. Which planet was Eena from?
- (B) Jupiter (A) Mars (C) Saturn
- (D) Cannot be determined
- 22. Which of following statements can never be true?
- (A) Each of Eena and Meena always spoke the truth. (B) Each of Eena and Meena spoke one truth and
 - (C) Deeka always spoke the truth.
- (D) The first statement given by each person was always false.

Directions for questions 23 to 25: These questions are based on the following information.

There are four persons - A, B, C and D - each of whom plays exactly one game from amongst Cricket, Football, Table-Tennis and Tennis. No game is played by two persons. Each person gives two replies to any question asked to them. At least one person among them always speaks the truth and at least one person always tells lies. There is at least one person who always alternates between the truth and lie in any order.

When asked about the names of the persons and the respective games played by them, following were their replies:

- A: I play Cricket. C plays Cricket.
- B: I play Tennis. D plays Tennis.
- C: A plays Table-Tennis. B plays Cricket.
- D: C plays Football. I play Table-Tennis.

It is also known that D plays Tennis and a definite arrangement can be obtained from the statements given by each person.

23. Who among the following plays Cricket?

(D) D O (O) (B) B A (A)

- 24. Who among the following always speaks the truth? (D) D O (O) (B) B A (A)
- 25. Who are the two persons who always alternate
 - between the truth and lie?
 - (B) B and C (A) A and D
 - (D) A and C (C) D and B

Directions for questions 26 to 28: These questions are based on the following information.

There are only four members of a family viz., A, B, C and D and there is only one couple among them. When asked about their relationships, following were their replies.

- A: B is my son. D is my mother.
- B: C is my wife. D is my father.
- C: D is my mother-in-law. A is my daughter. D: A is my grand daughter. B is my daughter-in-law.
- It was known that exactly one person among them always speaks the truth, one always tells lies and the other two persons always alternate between the truth and lie. All the relations mentioned exist only among them, if the relations

exist at all. It is also known that there are exactly two males in the family.

- 26. Who always speaks the truth? (D) D (B) B A (A)
 - 27. How is B related to C?
 - (B) Mother (A) Father (C) Brother-in-law
- (D) Husband

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- 28. Which of the following statements must be true?
- (A) A's grandmother alternates between the truth and lie
 - C's wife always speaks the truth.
 - (C) A's grandfather always speaks the truth.
 - (D) B's daughter always tells lies.

Directions for questions 29 and 30: Select the correct alternative from the given choices.

29. Three Pundits - Dwivedi, Trivedi and Chaturvedi sat in a row from left to right in some order, consisting of three seats - extreme left, centre and extreme right. Each person gives two replies to any question asked to them, at least one of which is true. There is exactly one person who always speaks the truth. When asked about their respective positions in the row, following were their replies:

Dwivedi: I sat at the left end.

Trivedi sat at the centre.

Trivedi: Dwivedi sat between me and Chaturvedi. I sat at the right end.

Chaturvedi: I did not sit at the left end.

Dwivedi did not sit at the right end.

It is also known that a definite arrangement can be obtained by assessing their statements. What is the order in which they sat from left end to the right end of the row?

- (A) Dwivedi, Trivedi, Chaturvedi
- (B) Chaturvedi, Trivedi, Dwivedi
- (C) Dwivedi, Chaturvedi, Trivedi
- (D) Trivedi, Dwivedi, Chaturvedi
- 30. Which of the following can be inferred from the given information?
 - Dwivedi's two statements are true.
 - Trivedi's second statement is false.
 - III. Chaturvedi's first statement is false.
 - (A) Only I
 - (B) Only I and III
 - (C) Only II and III
 - (D) None of the statements can be inferred

gives the exact positions of the three people?

Directions for questions 4 to 6: These questions are

P, Q and R when asked a question give three statements

P - always replies in only one type of statements - truth

Q - never replies in the same type of statements as P. R - is neither consistent in all his statement types nor

At the bus - stop, I asked: "Which bus goes to the airport?"

The north – bound bus comes from the airport.

You have to wait for another quarter of an hour for the

It takes anywhere between 1 hour to 1 hour

Which of the following represents the reply that R

(B) Lie - Truth - Truth

(D) Truth – Lie – Lie

You have to wait for 20 minutes for the bus. It takes 30 minutes to reach the airport.

alternates between the two types of statements.

It takes 45 minutes to reach the airport.

Take the South - bound bus.

30 minutes to reach the airport.

(A) Truth - Truth - Lie

(C) Lie - Lie - Truth

P always lies.

Q always lies.

(B) Bhavna is immediately behind Alex.

(C) Charan is not ahead of Bhavna.

(A) Bhavna is not behind Alex.

(D) None of the above

based on the following information.

as reply in the following manner.

Their replies were as follows: Take the North - bound bus. The next bus arrives in 15 minutes.

Which of the following additional conditions, if true,

Exercise - 6(b)

3.

:Q

Directions for questions 1 to 3: These questions are based on the following information.

Alex, Bhavna and Charan are standing, not necessarily in that order, in different positions in a queue of 10 people. The numbering in the queue starts with position 1 at the beginning to position 10 at the end of the queue. When asked about their positions in the queue, they gave the following replies:

Charan is three places ahead of me.

The number of people behind Bhavna is one more than the number of people ahead of Charan. If I interchange my position with Charan, I would be in position seven.

Bhavna: I am fourth from the end of the queue.

The sum of the numbers of our positions is a unit multiple of 5. I am exactly between Alex and Charan.

Charan: All of Alex's statements are false.

If I interchange my position with Alex, I would be

in position seven.

Bhavna's first and second statements are true. It is known that exactly two of the three persons alternate between truth and lie in any order and Charan is one of them.

- What is the position of Bhavna with respect to Alex?
 - (A) Immediately behind Alex.
 - Two positions behind Alex.
 - (C) Three positions ahead of Alex.
 - (D) Cannot be determined
 - Which of the following statements is true?
 - Alex is in position seven.
 - II. All the statements of Bhavna are false.
- false III. Alex alternates between true and statements in that order.
 - (B) Only I and II (A) Only II
 - (D) I, II and III (C) Only I and III
- III. The North bound bus goes to the airport.
 - (B) Only II (A) Only I

Which of the following is definitely true?

(D) Only II and III (C) Only I and II

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- How long does it take before I reach the airport from .6 the bus-stop?
 - (A) 45 minutes
 - (B) 50 minutes
 - (C) Between 1 hour and 1 hour 30 minutes
 - (D) 30 minutes

Directions for questions 7 to 11: These questions are based on the following information.

Three teenaged cousins (ages 13 - 19) Partha, Arjuna, and Sabyasachi when asked how old they are replied in the following manner.

Sabvyasachi is two years younger than me. Partha:

Arjuna lies about his age.

Sabyasachi is between 14 and 18 years of

I am 14 years old. Arjuna:

Sabyasachi is 16 years old.

Partha is less than 15 years of age.

Sabyasachi: Partha is not the oldest.

I am 19 years old.

Partha's third statements is a lie.

It is known that at any point of time exactly one among the three always speaks, the truth, one always lies and one always alternates between truth and lie in any order. Also, no two of them are of the same age.

- Which of the following must be true?
 - (A) Partha is the truth teller.
 - (B) Arjuna is the truth teller.
 - (C) Sabyasachi is the truth -teller.
 - (D) None of the above
- If Arjuna is the alternator, then which of the following .8
 - (A) Sabyasachi is 16 years old.
 - (B) Arjuna is 14 years old.
 - (C) Exactly one of (A) or (B)
 - (D) Both (A) and (B)
 - Sabyasachi will be 19 years of age when
 - Partha is the liar.
 - Arjuna is the alternator.
 - III. Sabyasachi is the truth-teller.
 - (A) Only I
 - (B) I and either II or III only
 - (C) Only I and III
 - (D) Sabyasachi will never be 19 years of age.
- 10. Which of the following statement(s) is/are definitely
 - (A) Partha's age is 13 years.
 - (B) Ariuna's age cannot be definitely determined.
- (C) Partha's age is 14 years when Sabyasachi's age is 19 years.
 - (D) All the above statements are false.
- 11. If Partha is the truth teller then, which of the following is/are true?
 - Partha's age is 18 years.
 - Arjuna's second statement is true.
 - III. Sabyasachi's third statement is false.
 - (B) Only I and III (A) Only II
 - (D) I, II and III (C) Only II and III

Directions for questions 12 to 14: These questions are based on the data given below.

There are four executives A, B, C and D each working in a different organization amongst Microsoft, Oracle, Infosys and IBM, not necessarily in the same order. Each of them gives three replies to any question asked, which are alternately true or false, in any order. When asked to mention the name of the executive and the organization that he works for, they gave the following replies:

- A: C works with Microsoft.
 - D works with IBM.
 - B woks with Infosys.
 - B: A works with IBM.
 - C works with Infosys. D works with Oracle.
- C: D works with Microsoft.
 - B works with Oracle.
 - A works with Infosys.
- D: B is not working with Infosys.
 - A is working with IBM.
- C is not working with Microsoft.

A definite arrangement can be obtained from the above information. Answer the questions based on the above data.

- 12. Who among the following works with Microsoft? (D) D $\mathcal{O}(\mathcal{O})$ (B) B A (A)
 - 13. B works with
 - (A) IBM (C) Microsoft
 - (B) Infosys
 - (D) Oracle
- 14. Which of the following statements must be false?
 - (A) D is working with IBM.
- (B) The first statements made by A, B and C are false.
 - (C) C is working in Infosys.
- (D) The second statements made by A, B and C are

Directions for questions 15 to 17: These questions are based on the data given below.

On the eve of Army Day Parade, I met five Army men -Ranjeet, Ranmeet, Ranpreet, Randheer and Ranveer each of whom had exactly one different rank from amongst Lieutenant, Captain, Colonel, Major and Brigadier, not necessarily in the same order. Each of these persons always gave three replies to any question asked to them. Except one person, all the other four speak at least one true statement. Except one person, all the other four tell at least one lie. Exactly one person among them alternates between the truth and lie, in any order. When I asked them about their respective ranks, following were their replies:

> Ranmeet is the Brigadier. Ranjeet:

Ranpreet is the Major.

Ranveer is the Colonel.

Randheer is the Major. Ranmeet:

Ranjeet is the Captain.

Ranpreet is the Lieutenant.

Ranjeet is the Colonel. Ranpreet:

Randheer is the Brigadier.

Ranmeet is the Captain. Ranveer is the Lieutenant. Randheer:

Ranjeet is the Major.

Ranpreet is the Captain. Ranmeet is the Colonel. Ranveer:

Ranpreet is the Major.

I am the Lieutenant.

Only one definite arrangement exists based on their statements, which gives out their ranks.

- 15. Who among the following always speaks one truth and tells two lies but does not alternate between truth and lie?
 - (B) Ranpreet (A) Ranjeet (D) Ranmeet (C) Randheer
- 16. What is the rank of the person who alternates between the truth and lie, in any order?
 - (B) Captain (A) Brigadier (D) Colonel (C) Major
 - 17. Match the following:

<u>Ranks</u>		Army men	
Lieutenant	(a)	Ranjeet	(i)
Captain	(d)	Ranmeet	(ii)
Colonel	(c)	Ranpreet	(iii)
Major	(b)	Randheer	(vi)
Brigadier	(e)	Ranveer	(v)
(B) (i) - (ii) - (iv) - (iv) - (iv) - (v) - (iv) -		$\begin{array}{cccc} (i) & - & (a) \\ (ii) & - & (b) \\ (ii) & - & (c) \\ (iii) & - & (c) \\ (v) & - & (e) \\ (ii) & - & (c) \\ (iii) & - & (d) \\ (iv) & - & (b) \\ (v) & - & (a) \\ \end{array}$	(A) (C)
	Lieutenant Captain Colonel Major Brigadier (ii) – (iii) – (iv) – (v) – (D) (i) – (iii) – (ii) – (ii) – (iii) –	(a) Lieutenant (b) Captain (c) Colonel (d) Major (e) Brigadier (ii) - (iii) - (iv) - (v) - (ii) - (D) (i) - (ii) - (ii) - (v) - (iii) - (ii) -	Ranjeet (a) Lieutenant Ranmeet (b) Captain Ranpreet (c) Colonel Randheer (d) Major Ranveer (e) Brigadier (i) - (a) (B) (i) - (ii) - (b) (iii) - (ii) - (c) (iii) - (i) - (c) (D) (i) - (ii) - (c) (D) (i) - (iii) - (d) (iii) - (iv) - (b) (iv) -

Directions for questions 18 to 20: These questions are based on the data given below.

On True-Lies island, there are four categories of people namely Trues, who always speak the truth; Liars, who always lie; Altrues, whose first statement is true and make alternate true and false statements and Allies, whose first statement is false and make alternate false and true statements.

A person from True Villa who visited the True Lies island has to make a telephone call to True Villa. He comes across a group of four people, where each member of the group belongs to a different category. He asks them about availability of telephone with them. Each person has a badge attached to his shirt with the name of a category to which he does not belong. The following are the statements made by each of them. The category on their badges is given in brackets.

A (Trues):

- Allies have telephones. .I
 - II. I have a telephone.

B (Liars):

- I belong to Trues.
- I do not have a telephone.

C (Altrues):

- I do not have a telephone.
- Only one of us has a telephone.

D (Allies):

- The Liars have telephones. .I
 - II. I belong to Altrues.

In any category, either each member has a telephone or none has a telephone.

18. Who belong to the Trues category?

(D) D O (O) (B) B

- 19. Which of the following is true?
 - (A) B has a telephone.
 - (B) C has a telephone.
- (C) Both B and C have telephones.
- (D) Neither B nor C has a telephone.
- 20. How many categories have a telephone?
- (D) 3 (C) 2 (B) 1 0 (A)

Directions for questions 21 to 23: There questions are based on the following information.

In a family, there are four members Bingo, Tingo, Mingo and Pingo. Each member of that family belongs to one of the following Category - Truth-tellers (who always speaks truth), Liars (who always lies) and the alternators (who alternates among truth and lie, in any order). They made the following statements when they are asked about their professions.

Bingo: I am a truth-teller.

I am the Manager.

Tingo is the Chartered Accountant.

Mingo: I am a truth-teller.

I am the Engineer.

Professor is an alternator.

Tingo: I am a truth-teller. I am the Professor. Pingo is the Engineer.

Pingo: I am an alternator. I am the Professor.

Bingo is a liar.

It is also known that their professions are one among Manager, Engineer, Chartered Accountant and Professor (may not be in that order). And no two persons are of the same profession.

- 21. If Tingo is the Manager, then who is the Chartered Accountant?
 - (A) Bingo (B) Mingo
 - (D) Either (A) or (B) (C) Pingo
- 22. If there is only one Liar and he is not Bingo, then who
- is the Engineer?
 - (A) Pingo
 - (B) Bingo
 - (C) Mingo
 - (D) Cannot be determined
- 23. From which of the given conditions, we will get a complete idea about them?
 - There are exactly two liars.
 - There are exactly two alternators. .II
 - III. There is no truth teller.
 - (A) Only I
 - (B) Only II
 - (C) Any two of the above three
 - (D) Only III

Directions for questions 24 to 26: These questions are based on the information given below.

John, James, Jack and Jeromy are compared with each other in terms of height, weight, age and wealth. Each of them gives three statements to any question, such that the three statements given by each person are alternately true and false, in any order. The first statement made by exactly two persons is false. When asked about the

characteristic possessed by each of them, following were their replies:

John: I am the tallest.

Jack is the heaviest.

James is the richest.

Jeromy is the shortest. Jack:

I am the youngest. John is the second tallest.

Jeromy: James is the lightest.

Jack is the poorest. John is the eldest.

James: I am the tallest.

Jack is the lightest.

Jeromy is the 2nd youngest.

It is also known that no person gets the same rank (or position) in any two of the four comparisons and no comparison has two persons having the same rank.

24. Who among the following is the 2nd heaviest?

(A) John

(C) Jeromy

(B) Jack

(D) James

25. Who is elder, wealthier, heavier, but shorter, than James?

III. John II. Jeromy Jack (B) Only II

(A) Only I (C) Only III

(D) II and III

26. How many persons weigh more than James?

(A) Zero owT (C)

(B) One (D) Three

Directions for questions 27 to 30: These questions are based on the information given below.

Each of the students A, B and C is from a different colleges among BIT, NIT and IIT majoring in a different stream among Civil, ECE and Mech, not necessarily in that order.

Each of these colleges is located in a different city among Delhi, Mumbai and Goa and each of them has a different rank among one, six and twenty-four, not necessarily in that order.

Each of A, B and C is one of a different category among truthteller, liar and inveigler, not necessarily in that order. (an inveigler speaks truth and lie in any order)

The following are the statements made by A, B and C.

:A

I am a truth teller

I am from BIT.

B is studying in a college located in Delhi.

C is majoring in Mech.

My college is not ranked sixth.

I am from BIT.

C is from IIT.

A is majoring in Civil.

IIT is ranked sixth.

I am from NIT and it is not ranked first.

I am an inveigler.

:0

My college is ranked sixth.

A studied in NIT which is located in Goa.

I am not majoring in Mech.

B is not majoring in ECE.

IIT is ranked first.

A is a truth teller.

27. In which stream is B majoring?

(A) Civil

(B) Mech ECE

(D) Cannot be uniquely determined

28. In which stream is A majoring?

(A) Civil

(B) Mech

ECE (C)

(D) Cannot be uniquely determined

29. What is the rank of the college located in Delhi?

(B) 24

(C) 1

(D) Cannot be uniquely determined

30. If the college in Goa is ranked 24, then what is the college located in Mumbai?

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В 26.

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27.

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30.

TIM (A)

(B) BIT

TII (O)

(D) Cannot be uniquely determined

Kev Exercise - 6(a)

16. В 11. В Э .6 1. C B D D Э Э 12. ٦. 2. 17. 3. В В 18. 13. .8 19. 4. 14. Э D Э В 9. В 15. 5. 20.

Exercise - 6(b)

26. Э В D 0000 21. D 16. D 11. B B 2. 3. 22. .7 Α 27. D 17. 12. D C Э D .8 28. 23. В 18. 13. α 29. 19. α 4. 24. В D 14. 9. Э В 25. В Э 10. 5. Α 30. 20. 15.

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