Binary Logic

Binary Logic questions are an important type which frequently appear in IT company entrances and MBA entrance exams. In these problems, you find people answer a questions in two or three different statements and some of them are true and some are false. Based on the clues given, we have to figure out the actual category of persons.

Solved Example 1:

Three persons give these statements.

A says either Democratic or Liberal wins the elections.

B says Democratic wins.

C says neither Democratic nor Liberal wins the elections.

Of these statements only one is wrong. Who wins the elections?

As only one statement is wrong, other two statements will be true.

Assume Democratic wins the election. Now Statements of A and B are true. Which satisfies our condition that 2 of them are truth tellers. So Democratic wins the election

If you assume Liberal wins the election, Statements of B and C are becoming false which is against our condition.

Note: Most of the binary logic questions can be solved easily if you start assuming like above.

Solved Example 2:

Consider the following statements:

Albert: Dave did it.

Dave :   Tony did it.

Gul: I did not do it.

Tony: Dave lied when he said that I did it.

(a) If only one out of all above statements is true, who did it?

(b) if only one out of all above statements is false, who did it?

We solve this question by assuming that Albert is thief. Then Dave, there after Gul. and put it in a table

Thief ->	Albert	Dave	Gul
Albert	F	T	F
Dave	F	F	F
Gul	T	T	F
Tony	T	T	T
		Dave did it	Gul did it

From the table, it is clear that only one statement is false when we assume Dave is thief. So answer for (b) is Dave. And only one statement became true, when we assume Gul is thief. So answer for (a) is Gul

Solved Example 3:

The police rounded up Jim, Bud and Sam yesterday because one of them was suspected of having robbed the local bank. The three suspects made the following statements under intensive questioning.

Jim : I'm innocent.

Bud: I'm innocent.

Sam: Bud is the guilty one.

If only one of the statements turned out to be true, who robbed the bank?

Assume Jim is the thief. Now Except Bud statement, remaining two statements became false which is given in the question. So Jim is the thief.

Solved Example 4:

Directions : Three criminals were arrested for shop lifting. However, when interrogated only one told the truth in both his statements, while the other two each told one true statement and one lie. The statement were:

ALBERT: (a) Clive passed the goods.

(b) Bruce created the diversion.

BRUCE : (a) Albert passed the goods.

(b) I created the diversion.

CLIVE :   (a) I took the goods out of the shop.

(b) Bruce passed goods.

Who created the diversion?

(a) Albert (b) Clive

(c) Bruce (d) either (a) or (c)

(e) either (b) or (c)

Solved Example 5:

Using the data from the above question, which of these statements is correct?

(a) Clive created the diversion.

(b) Albert took the goods out of the shop.

(c) Clive passed the goods.

(d) Albert created the diversion.

(e) Albert passed the goods.

Let 'T' represents true statement and 'F' represents false statement.

We have to check possibilities and contradictions by assuming one person speaking truth and others will say truth or lie alternatively.

Assuming Bruce to speak truth

	1 St	2nd
Albert	F	T
Bruce	T	T
Clive	T	F

Above mentioned possibility satisfies the conditions as others give contradictions.

So, Albert passed the goods.

Bruce created diversion.

Clive took goods out of shop.

Solved Example 6:

Directions: On an Island there live three types of tribes Sachcha, Jhutha and Lota. Sachchas always tell the truth, Jhuthas always lie and Lotas tell the truth and lie alternating (they can tell truth first or lie first). Three persons (of different tribes) from this Island give these statements.

GOOD: UGLY is of Sachcha tribe: I am of Lota tribe

BAD : GOOD is of Jhutha tribe; I am of Sachcha Tribe

UGLY: BAD is of Jhutha tribe; I am of Lota tribe.

GOOD belongs which tribe?

(a) Sachcha

(b) Jhutha

(c) Lota

(d) either (a) or (c)

(e) Cannot say

If we assume Good is of Sachcha tribe person, His both statements should be true. But one of his statement Ugly is of sachcha tribe should be wrong as there is only one shachcha tribe person.

Now assume BAD is of sacha tribe person. Now his second statement is obviously true and His first statement indicates that Good is of Jutha type which implies that Ugly is of Lota type. Now checking of the truthfullness of the statements of Good and Ugly, we get Good's both the statements are wrong and Ugly's one statements is correct and one is wrong. So Good Belong to Jutha tribe.

Solved Example 7:

Directions: Chatia, Matia and Toni participated in a race and on of them won the race. They belong to three different communities - Sororian, Nororian and Cororian. Sororians always speak the truth, Nororians always lie and Cororians always tell the truth and lie alternatively. (Each of Chatia, Matia and Toni belongs to one community.)

After the race they gave these statements.

Chatia: 1. I would have won the race if Toni had not obstructed me at the last moment.

2. Toni always speaks the truth.

3. Toni is the winner.

Matia: 1. Chatia won the race.

2. Toni is not a Nororian.

Toni: 1. I hadn't obstructed Chatia at the last moment.

2. Matia won the race.

Toni belongs to which community?

(a) Sororian (b) Nororian

(c) Cororian (d) Either b or c

(e) Cannot say

Solved Example 8:

Who won the race?

(a) Matia

(b) Toni

(c) Sororian

(d) Chatia

(e) Cannot say

Sol: Assume Matia is truth teller So he is a Sororian. Then Chatia is the winner and Toni is Cororian (Alternator)

Which implies Chatia is a false sayer (Nororian)

If we check the truthfullness of the Chatia, We get his all statements are wrong and Toni's one statement is wrong.

So Toni belongs to Cororian and Chatia won the race