



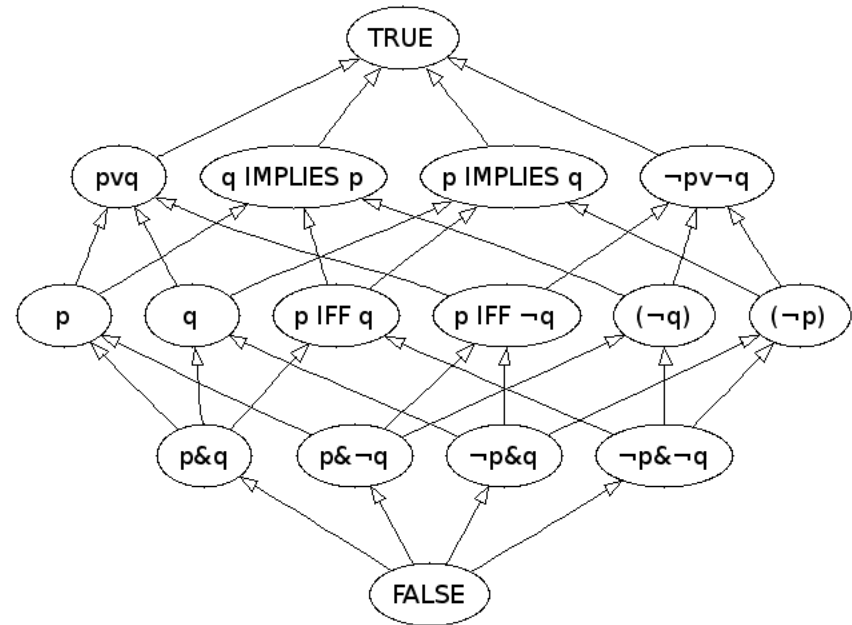
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LOGICAL CONNECTIVES



LOGICAL CONNECTIVES:

What are Logical Connectives?



Different types of questions on connectives:

1. Logical Connective (If, then)-

- ❖ **Form:** (If p , then q) or (q if p).
- ❖ **Example:** If it rains then ground gets wet.

In these statements cause is a sufficient condition for effect to happen but not necessary condition.



LOGICAL CONNECTIVES:



CASES:

Case 1. If cause is happening, it means it is raining so obviously ground gets wet (given).

So if cause (yes) then effect (yes).

Case 2. If cause is not happening, it means its not raining so we have no idea about the condition of ground because it may be wet or not. It can get wet by some other cause also, we don't know about that cause.

So if cause (No) then effect (may or may not be)



LOGICAL CONNECTIVES:



Case 3. If effect is happening, it means ground gets wet but we don't know how it gets wet. We have no idea about exact cause so cause may be or may not be happened.

So if effect (Yes) then cause (may be or may not be)

Case 4. If effect is not happening, it means ground does not get wet so we can clearly say that it has not rained because if it had rained the ground would definitely got wet.

So if effect (No) then cause is surely (No).



LOGICAL CONNECTIVES:



2. Logical Connective (only if/when) –

❖ **Form:** These statements are in the form of (Only If p , then q) or (q , only if p).

❖ **Example:** Only if Rohit runs fast, he will catch the train.

In these statements cause is a necessary condition for effect to happen but not sufficient condition.

Case 1– cause yes, it means Rohit runs fast so it doesn't mean that he will surely catch the train. Cause – yes; effect- may be may not be



LOGICAL CONNECTIVES:



Case 2 – cause no, it means Rohit doesn't run fast so according to statement he will catch the train only if he runs fast so surely he will not catch the train.

Cause- no; effect- no

Case 3 – effect yes, it means Rohit catches the train so surely we can say he ran fast.

Effect- yes; cause- yes.

Case 4 – effect no, it means he doesn't catch the train this doesn't implies that he didnot ran fast may be due to some other reason he was not able to catch the train.

Effect- no; cause – may be may not be



3. Logical Connective (If and Only If) –

❖ **Form:** It is like necessary and sufficient condition which means cause is a necessary and sufficient condition for effect to take place.

❖ **Example:** If and only If he clears the pre exam, he will get selected

Case 1. Cause is happening it means he cleared pre exam so surely he will get selected because given is 'if he clears exam he will get selected'.

Cause –yes; effect – yes



LOGICAL CONNECTIVES:



Case 2. Cause is not happening it means he has not cleared pre exam so surely he will not get selected.

Cause-no; effect-no

Case 3. Effect is happening it means he selected it implies surely he has cleared his pre exam.

Effect – yes; cause – yes

Case 4. Effect is not happening it means he has not selected .

By the statement ‘only if he clears the pre exam he will get selected’ we can say that he is not selected means he has not cleared pre exam.

Effect – No; cause-no



4. Logical Connective (unless):-

- ❖ **Form:** These statements are in the form of (Unless p, q) or (q, unless p)
- ❖ **Example:** Unless Virat is the captain, India will lose the match.

Case 1. If 1 is true it means Virat is the captain it doesn't mean that India will surely win the match so we can't say anything.

(1) – yes, (2) – may be may not be



LOGICAL CONNECTIVES:



Case 2. If 1 is false it means Virat is not the captain it means surely India will lose the match.

(1) – no, (2) – yes

Case 3. If 2 is true it means India lose the match so we can't say anything that Virat is the captain or not. India can also lose the match when Virat is captain.

(2) – yes, (1) – may be may not be

Case 4. If 2 is not true it means India won the match so we can surely say that Virat is the captain.

(2) – no, (1) – yes



5. Logical Connective (Either or):-

- ❖ **Form:** These statements are in the form of (either p or q).
- ❖ **Example:** I drink either green tea or juice.

In these type of statements clearly if one statement is false then second is true and if one is true second is false.

If I drink green tea it means surely I don't drink juice. And If I drink juice it means surely I don't drink green tea.



Question: 01



Whenever I go in sun I feel headache. Which one of the following can be concluded from this sentence?

- A. I went in sun so I have headache now.
- B. I didn't go in sun so I don't have headache now.
- C. I am feeling headache that means I went in sun.
- D. None of these

Answer: A

Explanation:



The given statement is: Whenever I go in sun I feel headache. Here let us assume that X is "I go in sun" and Y is "I have headache"

Then situation is "Whenever X then Y" and implications in this is $(X \rightarrow Y)$ and $(\sim Y \rightarrow \rightarrow X)$, now lets check options one by one

Option (a) I went in sun so I have headache now. $(X \rightarrow Y)$ its right conclusion.

Option (b) I didn't go in sun so I don't have headache now. $(\sim X \rightarrow Y)$ it can not be concluded

Option (c) I m feeling headache that means I went in sun. $(Y \rightarrow X)$, it can not be concluded.



Question: 02



Ram will either buy a Car or a Flat. Which one of the following can be concluded from this sentence?

- A. Ram bought a Flat so he will not buy a car.
- B. Ram bought a Car so he will not buy a Flat.
- C. Ram did not bought Car so he must have bought Flat.
- D. None of these

Answer: C

Explanation:



It is the case of "Either X or Y" hence $(\sim X \rightarrow Y)$ and $(\sim Y \rightarrow X)$ hence option (C) is correct.



Question: 03



Teachers can teach, only if students are interested.

Which of the following sentences to be combined to give correct meaning?

- i. Teachers can teach.**
- ii. Student are not interested.**
- iii. Teachers cannot teach.**
- iv. Student are interested.**

- A. (i) (ii)**
- B. (ii) (iii)**
- C. (iv) (i)**
- D. (iii) (iv)**

Answer: B

Explanation:

It can be concluded from the given statement that the event of "Teachers teaching" can happen only when students are interested or else it cannot happen. This has a reverse implication that if in case students are not interested, then teachers cannot teach. This is expressed by the choice BC.



Question: 04



The teacher gives a break, only if students are exhausted.

Which are the sentences to be combined to give correct meaning?

- i. The teacher gives break**
- ii. The teacher did not give a break**
- iii. Students are not exhausted**
- iv. Students are exhausted**

- A. (i) and (iii)**
- B. (i) and (iv)**
- C. (ii) and (iv)**
- D. None of these**

Answer: B

Explanation:

The conclusion can be:

The teacher gives break means Students are exhausted (as given in i and iv)
Students are not exhausted hence teacher will not give a break (as given in ii and iii)



Question: 05



Mobile is charged, if power is off.

Which are the sentences to be combined to give correct meaning?

- i. mobile is charged**
- ii. mobile is not charged**
- iii. power is off**
- iv. power is not off**

- A. (i) and (iv)**
- B. (ii) and (iii)**
- C. (iv) and (i)**
- D. None of these**

Answer: D

Explanation:

correct combination is (i) and (iii) and also (iv) and (ii)



Question: 06



Either Susmit is happy or he met his girlfriend.

Which are the sentences to be combined to give correct meaning?

- i. Susmit is happy**
- ii. Susmit is sad**
- iii. Susmit met his girlfriend**
- iv. Susmit didn't meet his girlfriend.**

- A. (i) and (iv)**
- B. (ii) and (iii)**
- C. (iv) and (i)**
- D. None of these**

Answer: C

Explanation:

The correct conclusion should be:

Susmit is sad that means he met with his girlfriend[ii and iii]

Susmit didn't meet his girlfriend so he must be happy [iv and i]



Question: 07

Unless boss is present employees don't work

Which are the sentences to be combined to give correct meaning?

- i. Boss is present**
- ii. Boss is not present**
- iii. Employee work**
- iv. Employee don't work**

- A. (i) and (iv)
- B. (ii) and (iv)
- C. (iv) and (i)
- D. None of these

Answer: B

Explanation:

It is the case of "Unless X , Y" the conclusion is:

Boss is not present means employees don't work. [ii and iv]

Employee work means boss is present. [iii and i]



Question: 08



If you don't save money you will not get reward.

Which are the sentences to be combined to give correct meaning?

- i. You saved money**
- ii. you didn't save money**
- iii. you got reward**
- iv. you didn't get reward**

- A. (i) and (iv)**
- B. (ii) and (iii)**
- C. (iii) and (i)**
- D. None of these**

Answer: C

Explanation:

This is the case of If X then Y the conclusion should be:

You don't saved money means you will not get reward. [ii and iv]

You got reward means you saved money. [iii and i]



Question: 09



If X walks less fast than Y, and Y walks as fast but not faster than Z; then, as compared to X, Z walks:

- A. slower than X
- B. faster than X
- C. with same speed as X
- D. given data is not sufficient to determine

Answer: D

Explanation:

Option a) is incorrect, as the first statement does not state that listening radio is the only thing to do when the person gets bored.

Similarly, Option b) and c) are also incorrect.

Option d) is the logical conclusion that can be drawn from the statements.

Explanation (2):

From the given information, we get the following.

$$Z = Y > X$$

Z walks faster than X.



Question: 10



“In the last T 20 Series, Virat Kohli was in great form and India won the match” is a true statement. Which of the following conclusion is correct?

- A. If Virat Kohli were not in great form in the last ODI India would not have own.
- B. In the last T 20 Series Virat Kohli was in great form.
- C. India did not win the match.
- D. India won the series.

Answer: **B**

Explanation:



In a problem like this, it makes sense to mark parts (i.e., constituent propositions) with symbols.

X: In the last T 20 Series Virat Kohli was in great form.

Y: India won the match.

Then X and Y is true.

(a) Now if X is not true can we say that Y would be false? No way.

(b) Surely, X is true otherwise 'X and Y' cannot be true.

(c) Y cannot be false, because 'X and Y' is given to be true.

Hence, the statement in C cannot be correct.

(d) In 'X and Y', there is no mention about the series. So this statement in (d)



Question: 11



“In the ensuing Panchayat polls, either OP Dhankar will get a massive mandate or dissidence in Haryana BJP intensify”. This is a True statement.

Which of following is not correct?

- A. OP Dhankar got a massive mandate but dissidence in haryana BJP intensified.
- B. Dissidence in Haryana BJP actually faded out.
- C. OP Dhankar did not get a massive mandate in Panchayat polls.
- D. Panchayat polls did not throw up clear results.

Answer: A

Explanation:



Let us name constituent propositions as follows:

P: In the ensuing Panchayat polls OP Dhankar will get a massive mandate.

Q: Dissidence in Haryana will intensify.

It is given that “Either P or Q” is true.

We are looking for an answer choice that is untrue.

- (a) P and Q are both stated to true in this answer choice. This is impossible.
- (b) This statement means that Q proved to be untrue. That is very much possible.
- (c) This means that P did not come true. This is also possible. No contradiction.
- (d) We cannot make any comment about this event. May or may not be true.

Hence (a)



Question: 12



Only if Tara is happy, then she does not go to work.

Which are the sentences to be combined to give correct meaning?

- A. Tara is not happy and she does not go to work.
- B. Tara is happy and she goes to work.
- C. Tara is not happy and she goes to work.
- D. Tara is happy and she does not go to work.

Answer: C

Explanation:



The event of "Tara is not going to work" happens only when the event "Tara is happy" happens. Also, if the event "Tara is happy" does not happen, then the event "Tara is not going to work" will not happen. In other words, if it is true that Tara is not happy, then it means that Tara is going to work.



Question: 13



Paul is popular either as a lead guitarist or as a base guitarist.

Which are the sentences to be combined to give correct meaning?

- A. Paul is popular as a lead guitarist but not as a base guitarist.
- B. Paul is famous neither as a lead guitarist nor as base guitarist.
- C. Paul is not popular as base guitarist but popular as a lead guitarist.
- D. Paul is popular as both a lead guitarist as a base guitarist.

Answer: C

Explanation:



The given statement implies that Paul is popular as at least one image. Hence, if it is true that Paul is not popular as a base guitarist, then it implies that he is popular as a lead guitarist.



Question: 14



The loan will not be recovered or the deposit will be returned.

Which are the sentences to be combined to give correct meaning?

- A. The load will be recovered and the deposit will not be returned.
- B. The loan will not be recovered and the deposit will be returned.
- C. The deposit will not be returned and the loan will not be recovered.
- D. The deposit will be returned and the loan will be recovered.

Answer: C

Explanation:



Either one of the two events "The loan will not be recovered" or "The deposit will be returned" should happen. If it is true that the deposit will not be returned, then it is true that the loan will not be recovered.



Question: 15



Hitchcock cannot trace the culprit, only if there is no clue.

Which are the sentences to be combined to give correct meaning?

- A. There is no clue, but Hitchcock could trace the culprit.
- B. Hitchcock could trace the culprit, because there is clue.
- C. There is a clue and Hitchcock could trace the culprit.
- D. Neither is there a clue, nor could Hitchcock trace the culprit.

Answer: C

Explanation:



The event "Hitchcock cannot trace the culprit" can happen only when the event "there is no clue" happens. Also, if the event "there is no clue" does not happen, then the event "Hitchcock cannot trace the culprit" cannot happen. In other words, if it is true that there is a clue, then it implies that Hitchcock could trace the culprit.

