**4. Exclusive:** Let p and q be propositions. The exclusive of p and q is denoted by  $p \oplus q$  and is true when exactly one of p and q is true and is false otherwise.

**Conditional Statement:** Let p and q be propositions. The conditional statement of p and q is denoted by  $p \rightarrow q$ .

It is read as "If p, then q".

Here p is known as hypothesis or anticedent or premise and q is called conclusion or consequence.

concrabio	or con	bequence.			
The condi	tional s	tatement $p \rightarrow q$	is		
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Example:
Then you will get A grade.

If you get 100% morres, Then you will get it grade. Example: \* b-9 can be written as 7/049, Converse, Contrapositive and Inverse Statement for given pg statement \* Converse statement is: 9 >> \* Contrapositive statement: 79, -> 76 \* Inverse Statement: 70-> 79 Invesse Contrapositive Converse b is usufficient for 9 If PiThen 9. q is necessary for b. b implies q 9 whenever b

## 9 whenever 6

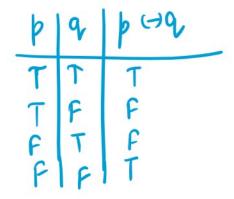
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## **Biconditional Statement**

Let p and q be propositions. The biconditional statement of p and q is denoted by  $p \longleftrightarrow q$ .

It is read as "p if and only if q".

The biconditional statement  $\,p \longleftrightarrow q\,$  is true when both has same truth values.



b if and only if 9.

b iff 9.

b is necessary and sufficient for 9.

**Practice Questions** 

a. Construct touth tables for

**Translating English Sentence in logical statement** 

- 2) b: It is below freezing q: It is Snowing
- (A) It is below freezing but not snowing.
- (B) It is below breezing is necessary and sufficient for it to be it is is nowing.
- (c) Below freezing is sufficient for it to be snowing.
- Q3 find truth values of following:
  - (a) If 1+1=2, Then 2+2=5
  - (b) If monkeys can fly, then 1+1=3