NOTES:-

A mathematically acceptable statement is a sentence that is either true or false.

Explained the terms: –

–Negation of a statement p:- If p denotes a statement, then the negation of p is denoted by ~p.

– Compound statements and their related component statements: A statement is a compound statement if it is made up of two or smaller statements.The smaller statements are called component statements of the compound statement.

– The role of "And", "Or", "There exists" and "For every" in compound statements.

– The meaning of implications "If ", "only if ", " if and only if ". A sentence with if p, then q can be written in the following ways.

– p implies q (denoted by p ⇒ q)

– p is a sufficient condition for q – q is a necessary condition for p – p only if q – ~q implies ~p

– The contrapositive of a statement p ⇒ q is the statement ~ q ⇒ ~p . The converse of a statement p ⇒ q is the statement q ⇒ p. p ⇒ q together with its converse, gives p if and only if q.

The following methods are used to check the validity of statements:

 (i) direct method (ii) contrapositive method (iii) method of contradiction (iv) using a counter example.

De Morgons Law

1. **The complement of the union of the two sets A and B will be equal to the intersection of A' (complement of A) and B' (complement of B)**. This is also known as De Morgan's Law of Union. It can be represented as (A ∪ B)' = A' ∩ B'.

2. The second law or the Law of Intersection states that **an element not in A ∩ B is not in A' or not in B'**. Conversely, it also states that an element not in A' or not in B' is not in A ∩ B. i.e. (A ∩ B)