Math 301

Date

1. Commutative law :-

$p \wedge q \equiv q \wedge p$

$p \vee q \equiv q \vee p$

2. Associative law :-

$p \vee (q \vee r) \equiv (p \vee q) \vee r$

3. Distributive law :-

$p \wedge (q \vee r) \equiv (p \wedge q) \vee (p \wedge r)$

4. identity law :-

$p \wedge t \equiv p$ ___ (i)

$p \vee c \equiv p$ ___ (ii)

5. Negation law :-

$p \wedge \sim p \equiv c$

$p \vee \sim p \equiv t$

6. Double negation law :-

$\sim(\sim p) \equiv p$

7. idempotent Law :-

$p \wedge p \equiv p$

$p \vee p \equiv p$

8. De Morgan's law :-

$\sim(p \wedge q) = \sim p \vee \sim q$

$\sim(p \vee q) = \sim p \wedge \sim q$

9. universal bound Law :-

$p \wedge t \equiv c$

$p \vee c \equiv t$

10. Absorption Law :-

$p \vee (p \wedge q) \equiv p$

$p \wedge (p \vee q) \equiv p$

11_Negation of t and c Date __/__/__

$\sim t = c$

$\sim c = t$

Simplify:-

$p \vee [\sim(\sim p) \vee (\sim q)]$

$= p \vee [\sim(\sim p)$

$= p \vee [p \vee (\sim q)]$

$= (p \vee p) [\vee (\sim q)]$

$= p \vee (\sim q)$ Ans

Simplify statement:-

1_ It is not true that I am tired or/and you are smart.

I am not tired and/or you are not smart.

2_ I forget or my pen or my bag and I forget my pen or my glasses.

I forget my pen or I forget my bag and glasses.

3_ If today is friday then $2+3 \neq 5$

If not friday $2+3 \neq 5$

Biconditional Laws and Logics:-

commutative Law:-

$p \leftrightarrow q = q \leftrightarrow p$

Date

Implication Law:-

$$p \to q \equiv \neg p \vee q$$
$$\equiv \neg(p \wedge \neg q)$$

Exportation Law:-

$$(p \wedge v) \to r \equiv p \to (q \to v)$$

Equilation Law:-

$$p \leftrightarrow q \equiv (p \to q) \wedge (q \to p)$$

Reduction and absurdum

$$p \to q \equiv (p \wedge \neg q) \to c$$

Argument:-

Assumption, hypothesis, conclusion
ایسی تمام چیزیں جو discuss کرنے سے قبل ہوں ان کو
arguments کہتے ہیں).

valid argument:-
Non-valid argument:-