## Subject:Discrete Mathematics

## Topic:Conditional,Converse

LISNA THOMAS ACADEMIC YEAR:2020-21

VINLIIININFL, IINVLRIUL, ONVERSE AND CONTRAPOSITIVE EXAMPLES

## Example1:

Conditional:If it is my birthday, then I get cake.(p->q)
Converse: If $i$ get cake,then it is my birthday.(q->p)
Inverse:If it is not my birthday,then I do not get cake.( $\sim \mathrm{p}->\sim q)$
Contrapositive:If I do not get cake,then it is not my birthday.( $\sim q->\sim p)$
Biconditional:It is my birthday iff i get cake $(p \Leftrightarrow q)$

## Example2:

Conditional:If I study hard, I shall succeed(p->q)
Inverse:If I don't study hard then I shall not succeed( $\sim p->\sim q)$
Converse; If I shall succeed , I study hard.(q->p)
Contrapositive:If I shall not succeed,I don't study hard.( $\sim q->\sim p)$
Biconditional:I study hard iff I shall succeed $(p \Leftrightarrow q)$

## Example 3:

Conditional: If it rains then I get wet.(p->q)
Inverse: If it does not rains then I don't get wet.( $\sim \mathrm{p}->\sim q)$
Converse:If I get wet then it rains.(q->p)
Contrapositive: If I not get wet then it is not rains.( $\sim q->\sim p)$
Biconditional:It rains, iff I get wet $(p \Leftrightarrow q)$

## HW

1) Conditional:If it rains ,then the atmospheric humidity increases.
2) If he studies well,then he will pass the examination
3) If it rains,then Ram does not drive the car.
4) If $x$ is less than zero then $x$ is not positive.
5) If it is raining then home team wins.

## ARGUMENTS

An argument is a list of statements called premises.Statements premises(Assumption,hypothesis) followed by the statement called conclusion.

The argument is either valid or invalid.

| Eg: | P1 | P2 | C |
| :--- | :--- | :--- | :--- |
| T | T | T |  |
| T | F | T |  |
| F | T | T |  |
| T | T | F |  |
| T | F | F |  |
| F | T | F |  |
| r | T |  |  |

CRITICAL ROW:-A row in which all premises are true.
Eg:Prove that the argument is valid or not

1) $p \Rightarrow q, p, q$
$P \Rightarrow q---p 1$,
P-----p2,
q------C

| p | q | p $\Rightarrow q$ | $p$ | q |
| :--- | :--- | :--- | :--- | :--- |
| T | T | T | T | T |
| T | F | F | T | F |
| F | T | T | F | T |
| F | F | T | F | F |

