Symbolic Logic

series -3

For BA-III PHILOSOPHY (HONS)

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Review of previous presentation

- Symbolic logic is concerned with statements.
- Statements are of two types- Simple and compound
- Compound statements are also of two types – Truth Functional and Non-truth Functional .

- When the truth value of a compound statement depends on its components, it is called **truth functional compound statement.**

- When the truth value of a compound statement does not depend on its components ,it is called **non- truth functional compound statement**.

- We shall consider here with truth functional Compound statements.

Types of truth- functional compound statements

Truth functional compound statements are न of four types :-

- 1. Conjunctive statements (Conjunction)
- 2.Disjunctive statements (Disjunction)
- 3.Hypothetical statements (Implication)
- 4.Negative statements (Negation)

Conjunction

- A compound statement formed by inserting the word ‘and’ between two statements, is called conjunctive ccompound statements. eg- Roses are red and violets are blue.

- Two statements so combined are called conjuncts.

- We introduce **‘ . ‘ dot** as a special symbol for combining statements.

- Using this notation, the conjunction is written as – ‘ Roses are red **.** Violets are blue.’

Truth- value of A conjunction

- Every Compound statement is either true or false, that is the truth value of a statement.
- Truth value of true statement is true and the truth value of false statement is false.
- The truth value of the conjunction of two statements is completely determined by the truth value of its conjuncts.
- A conjunction is true if both of it's conjuncts are true,but false otherwise.
- For this reason a conjunction is a truth- functional compound statement,and it's conjuncts are truth – functional components of it.

- In symbolic logic, statements (components) are symbolised by the first letter of the Capital alphabet i.e. A,B,C,D.....

- And when,statements are substituted by variables using middle of the alphabet i.e. - p, q, r, s.... Called statement forms.

- If the number of variables is 2,there will be 4 possible cases of truth- falsity.

- Number of possibilities is decided by the formula ‘**2 raised to the power of n’ (2 ^ n)** , where ‘n’ is the number of variables .

- Truth value of true statement is true and false statement is false represented by capital **‘ T’** and capital **‘ F’** respectively.

Symbolisation of Conjunction

- **'Roses are red and violets are blue** ‘ is a conjunctive
- compound statement which has two components ,can
- be symbolised as :-

- Roses are red – ‘p’ (the first letter of the middle of the alphabet).

- And- ‘.’

- Violets are blue –' q '(the second letter of the middle of the alphabet)

- It may be written as **‘ p.q’**

Truth- table of Conjunction

- The truth value of a conjunctive compound statement can be displayed more briefly by means of a truth table as follows :

- We have symbolised earlier 'roses are red and violets are blue as p.q.
- Here we will see ,how the truth value of a conjunctive statement **p.q** depends on the truth value of its conjuncts **p** and **q :-**

P	Q	P . Q
T	T	T
T	F	F
F	T	F
F	F	F

- Since it specifies the truth- value of p.q in every possible case, this truth table can be taken as defining the dot symbol.

- Other English word such as ‘more over’, ‘further more’ , ‘ but’, ‘ yet’ , ‘ Still’ , ‘ However’, ’also’, ‘nevertheless’, ‘although’, and so forth,and even the comma and the semicolon, are also used to conjoin two statements into a single compound one.

- All of them can be indifferently translated into the dot symbol.

Thank you