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INFLUENCES OF MATHEMATICS IN MODERN LOGIC: A BRIEF STUDY

Dr. Shyamal Chandra Sarkar

(Assistant Professor, Department of Philosophy P.B.College, Gauripur)

ABSTRACT

Mathematics is one of the studies which help us to gain knowledge. It also helps us to understand and solve various types of knowledge. Learning mathematics will help students to grow their problem-solving and logical reasoning skills. Our primary assumptions necessarily imply or entail the theorems which are deduced from them and ignore the question whether our conclusions as well as our axioms or postulates are in fact true in pure mathematics.

Aristotle introduced variables and symbols in logic. After that, G.W. Von Leibnitz, George Boole, C.S. Pierce, Augustus de Morgan, W.S. Jevons, Bertrand Russell, C.I. Lewis etc. broadly introduced symbols in logic which is purely formal science. The chief aim of symbolic logic is to distinguish between the validity and invalidity of arguments by determining the form of the argument through the application of symbols.

Symbolic logic is a modern development of classical deductive logic formulated by Aristotle and has emerged as a result of the use of the large amount of symbols in accordance with modern mathematical methods and principles. George Boole, and Augustus De Morgan, in the middle of the 19th century, presented a systematic mathematical way of regarding logic. The most important common type of symbols, used in symbolic logic, are logical constants and variables. These are ' \cdot ' (Conjunction), ' \vee ' (disjunction), ' \vee ' (alternation), ' \neg ' (negation), ' \supset ' (implication), and ' \equiv ' (equivalence).

A truth- table is used (I) to define truth-functional expression and (II) to test the validity of a good number of deductive arguments. In truth table, the capital letter 'T' or numerical '1' is used for 'True' and the capital letter 'F' or the numerical '0' is used for 'false'. Thus, 'T' or '1' and 'F' or '0' are the signs used for indicating values. In Symbolic logic, we can test the validity or invalidity of arguments by applying truth table methods, rules of inference and replacement Venn Diagram etc.

Key notes: introduction of mathematics and symbolic logic, brief history of symbolic logic, uses of symbols in logic, rules of Inference and Replacement, uses of Venn diagram in symbolic logic

Introduction:

Mathematics simply means to learn or to study or gain knowledge. The theories and concepts given in mathematics help us understand and solve various types of problems in academic as well as in real life situations. It is a subject of logic. Learning mathematics will help students to grow their problem-solving and logical reasoning skills. Solving mathematical problems is one of the best brain exercises.¹