

NORTH MAHARASHTRA UNIVERSITY, JALGAON

Revised Syllabus for S.Y.B.A. Logic

with effect from July 1998

Logic and Methodology of Science (Advanced Logic)

General Paper-II

Section-I: Propositional Logic.

Topic-1 : Decision Procedures

- a) Conjunctive Normal Forms.
- b) Disjunctive Normal Forms.

Topic-2 : Brackets, Polish notations and Stroke and Dagger Operators.

- a. Brackets, Parenthesis - free Notations.
- b. Use of Dots as Brackets
- c. Polish Notations - Rewriting logical connectives and various logical formalize interms of Polish Notations.
- d. Stroke and Dagger Operators - Their nature and basic truth tables, Rewriting logical connectives in terms of stroke and dagger functions.

Topic-3 : Method of deductions and Proving Invalidity.

- a. Method of Conditional Proof.
- b. Method of Indirect Proof.
- c. Proof of tautologies by C.P. and I.P.
- d. Proof of Invalidity, Examples on proving Invalidity.

Topic-4 : Axiomatic System

- a. Elements of deductive system and their rules.
- b. Evaluation of deductive system interms of consistency, completeness and Independence.
- c. Russell's P.M. System and Its first 15 theorems.

Section - II : Predicate Logic

Topic-5 : Predicate Calculus.

- a. Need for the study of predicate structure of propositions.
- b. The symbolic structure of predicate propositions Individual & Predicate Constants, Individual and Predicate variables.
- c. Singular and general propositions-Their nature and symbolization

- d. Propositional functions.
- e. Distinction between propositional function and proposition.
- f. Quantifiers - Universal and Existential

Topic-6 : Preliminary Version of Quantificational rules

- a. Universal Instantiation (U.I.)
- b. Existential Instantiation (E.I.)
- c. Universal Generalization (U.G.)
- d. Existential Generalization (E.G.)

Topic-7 : Proving Validity in Predicate Logic

- a. Proving validity of arguments involving quantifiers by direct proof.
- b. Proving by Conditional proof the validity of arguments involving quantifiers.

Topic-8 : Proving Invalidity in predicate Logic

- a. Method of demonstration of Invalidity of arguments in predicate Logic.
- b. Exercises in demonstrating the invalidity of Invalid arguments involving quantifiers.

#### Books for reading and reference

1. Symbolic Logic - Copi and Cohen
2. Introduction to Logic - Copi and Cohen
3. Element of Formal Logic - Hughes and Londey
4. Element of Logic - Stephen Barker
5. त्रुगम आकारिक तर्कशास्त्र - डॉ. कावडे व डॉ. गोडे.
6. तर्करेखा भाग-१ - डॉ. बारलिंगे व डॉ. मराठे.
7. तर्करेखा भाग-२ - डॉ. बारलिंगे व डॉ. मराठे.
8. आकारिक तर्कशास्त्र - मे. पुं. रेगे.
9. तर्क दिपिका - प्रो. आकोलकर.

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