

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**

Revised Syllabus for T.Y.B.A.  
General Paper-III (G-3)  
Logic and Methodology of Science

(With Effect From July, 1999)

**FORMAL AND INDUCTIVE LOGIC**

**SECTION-I (FORMAL LOGIC)**

1) Advanced Predicate Logic :-

Singly and multiply general propositions : Its nature and symbolization, free and Bound variables. Revised rules of quantification UI, UG, EI and EG. proving validity of arguments involving multiply general propositions. Rule of quantifier negation.

2) Proving logical truths involving quantifiers.

Examples on proving logical truths involving quantifiers.

3) Relational Logic.

- (a) Nature and logical structure of relational proposition. its kinds.
- (b) properties of dyadic relations-Symmetry-asymmetry-Non symmetry Transitivity-Intransitivity-Non-transitivity Reflexivity-Irreflexivity-Nonreflexivity.
- (c) Symbolizing relational propositions, proving validity of arguments involving relational propositions by direct and conditional proof.
- (d) Enthymeme + Its nature, proving the validity of relational enthymic argument.
- (e) Principle of identity. Definite descriptions (Introductory part only).
- (f) Symbolic logic. - Basis of computation.

4) Elements of set theory :-

- (a) Definitions - Set. Elements of set, sub - set, proper sub - set, Null set and universal set.
- (b) Modes of specifying a set - Listing and defining.
- (c) Basic operations on set - Union, Inter section and complementary.
- (d) Examples on set, elements of set, sub - set and set operations.
- (e) Rule of commutation, Association, Distribution and Demorgan's laws interms of set theory.
- (f) Inter preting A, E, I and o propositions interms of set theory.

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SECTION-II (Inductive Logic)

5) Inductive inference - Nature and types :-

Nature of induction, Distinction between inductive and deductive inference, problems of induction, Types of induction - Scientific induction, simple enumerative induction and Analogy.

6) Grounds of Induction :-

- (a) Formal grounds of induction - principle of uniformity of nature, principle of causality, popular and scientific notion of cause, notion of functional dependence.
- (b) Material grounds of induction - observation, experiment and testimony.

7) Hypothesis, Methods, laws and explanation.

- (a) Hypothesis - Its nature, origin and types, conditions of valid Hypothesis.
- (b) Mill's methods - method of agreement and method of difference.
- (c) Method of probable reasoning - Its nature grounds and methods of measuring probabilities.
- (d) Statistical method - Its nature and stages, measurements of central tendencies - mean, mode and median, coefficient of correlation.
- (e) Various uses of the expression 'law'. Nature and classification of laws of nature.
- (f) Nature and forms of scientific explanation. Distinction between popular and scientific - explanation.

8) Research methodology in Social Sciences :-

- (a) Distinction between natural and social sciences.
- (b) Methods and techniques of data collection- observation- participant and Non participant, Interview method and Questionair Schedule.

BOOKS FOR READING AND REFERENCES

- 01) Symbolic Logic - Copi and Cotten.
- 02) Introduction to Logic - Copi and Cotten.
- 03) The elements of formal logic - Hughes and Londey.

- 04) Introduction to Logic - Suppes P.
- 05) Logic by Way of set theory - Eblers. Henry.
- 06) Methods of Logic - W.V.O. Quine.
- 07) Modern Introduction to Logic - L.S. Stebbing.
- 08) Introduction to Logic and Scientific method - Cohen and Nagel.
- 09) Structure of Science - E. Nagel.
- 10) Methodology of Social research - Goode and Hat.

- 11) लॉजिक भाग-1 - डा. वेमरान्ते व डी अर्मा.
- 12) लॉजिक भाग-2 डा. वेमरान्ते व डी अर्मा.
- 13) प्रथम आधुनिक लॉजिक - डॉ. एम. वी. वॉल.
- 14) आधुनिक लॉजिक - डॉ. ए. वॉल.
- 15) प्रथम लॉजिक भाग वैज्ञानिक पद्धती - डॉ. एम. वी. वॉल.
- 16) लॉजिक भाग - विभाग 1 डा. वेमरान्ते व डी अर्मा.
- 17) लॉजिक भाग 2 डा. वेमरान्ते व डी अर्मा.
- 18) लॉजिक भाग 3 डा. वेमरान्ते व डी अर्मा.
- 19) लॉजिक भाग 4 डा. वेमरान्ते व डी अर्मा.
- 20) लॉजिक भाग 5 डा. वेमरान्ते व डी अर्मा.