Chapter 14

MATHEMATICAL REASONING

Type-I

Concept: statements: A sentence which is either true or false, but not both

(1) N.C.E.R.T text book page 324
Question no.1(*) , 2(*),4(*),9(*),10(*)

Type-II

Negation of a statement: Denial of a statement is called negation of a statement.

(1) N.C.E.R.T text book page 329
Question no.1(*),2(*),3(*),4(*),5(*)

Type-III

Compound statement and component statement

A compound statement is a statement which is made up of two or more statements .Each statement is called a component statement.

(1) N.C.E.R.T page 327 example 4(*)

(2) N.C.E.R.T page 329 exercise 14.2 - question no.3(*)

Type-IV

Compound statement with ‘and’ or ‘or’

(1) N.C.E.R.T page 330 example 6
(2) N.C.E.R.T page 333 example 8

Type-V

Quantifiers

Quantifiers are phrases like ‘there exists’ and ‘for all’ etc...

(1) N.C.E.R.T page 335 exercise 14.3 question no.2(*)

Type-VI

Inclusive or exclusive or

(1) N.C.E.R.T page 332 example 7
(2) N.C.E.R.T page 335 exercise 14.5 question no.4

Type-VII

Implications

(1) N.C.E.R.T page no.338 exercise 14.4 question no.1(**)
(2) N.C.E.R.T page no.345 Mis exercise 14.4 question no.7(**)
(3) Rewrite the following statement with if then in five different ways
If a number is a multiple of 9, then it is a multiple of 3.

Type-VIII

Contra positive and Converse statement

Contra positive statement of p=>q is ~ q implies~p

Converse of the statement p=>q is q=>p.

(1) N.C.E.R.T page 336 example 9(**)
(2) N.C.E.R.T page 337 example 10(**)
(3) N.C.E.R.T page 338 exercise 14.4 question no .2(**)
(4) N.C.E.R.T page 345 misc. exercise question no.2(**)

Type-IX

Validating statements

Direct method: By assuming that 'p' is true, prove that 'q' must be true.

Contra positive method: By assuming 'q' is false, prove that 'p' must be false.

Method of contradiction: Assume 'p' is not true. Then we arrive at some result which contradicts our assumption.

(1) N.C.E.R.T page 342 exercise 14.5 question no.1(**)
(2) N.C.E.R.T page 342 exercise 14.5 question no.3(**)
(3) N.C.E.R.T page 345 Mis exercise 14.5 question no.6(*)
(4) N.C.E.R.T page 340 example 13(**)
(5) N.C.E.R.T page 340 example 14(**)
(6) N.C.E.R.T page 340 example 15(**)

Type-X

By giving a counter example we can disprove a given statement.

(1) N.C.E.R.T page 342 question no.4(**)
(2) N.C.E.R.T page 342 example 7(*)

Type-XI

Validating of compound statement

(1) N.C.E.R.T mise exercise –question no.5(*)