

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 $p \Rightarrow q$ is $\sim q$ implies $\sim p$

Converse of the statement $p \Rightarrow q$ is $q \Rightarrow p$.

- (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(*)

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