CHAPTER 7

MATHEMATICAL LOGIC

PROPOSITIONS

- A Proposition is a declarative sentence that is either true or false , but not both .
- The variables that represent propositions are called propositional variables.

EXAMPLES

- 7 is a prime number – It is a declarative sentence and is true.
- The angle between two parallel lines is a right angle- It is a declarative sentence and is false.
- X+2=5 –It is not a declarative sentence

TRUTH VALUE OF A PROPOSITION

The truthfulness or falsity of a proposition is called its truth value

SIMPLE PROPOSITIONS

- Any proposition whose truth value does not explicitly depend on another proposition is said to be a simple proposition
- Example- The set of real numbers is a finite set

COMPOUND PROPOSITIONS

- A proposition formed by combining two or more simple propositions is said to be a compound proposition
- Example- A quadrilateral is a rhombus if and only if its diagonals are at right angles

REMARK

The area of logic that deals with propositions is called the propositional calculus or propositional logic

Which of the following sentences are propositions ?

- The earth is flat
- What a beautiful day!
- 2 is a prime number
- Every odd number is prime
- Answer this question

Find the truth value of each of the following propositions

- Trivandrum is the capital of Kerala
- 2+5=7
- New Delhi is the capital of Kerala
- 2+5=10
- The set of real numbers is a finite set

GIVE SOME EXAMPLES FOR SIMPLE AND COMPOUND PROPOSITIONS

THANK YOU