- **N:** Natural numbers (e.g., 1, 2, 3, ...).
- **Z:** Integers (e.g., ..., -3, -2, -1, 0, 1, 2, 3, ...).
- **Q:** Rational numbers (e.g., fractions like 1/2, -3/4, 7/5, ...).
- **R:** Real numbers (e.g., integers, fractions, decimals, and irrational numbers).

Now, instead of writing “x is a natural number”,we write “x Є N”so thereforeA = {x | x is a natural number that is a multipleof 3}becomesA = { x | x Є N and x is a multiple of 3}

Set-Builder Notation
Write the following in set-builder notationA = {a, e, i, o, u}
Answer: A = {x | x is an English vowel}
(Q)E = {2, 4, 8, 16, . . .}
Answer: E = {x | x Є N and x = 2^y ,y Є N, y > 0}

•Equal sets - Two sets are equal sets if and only if they contain the same elements and order doesn’t matter and quatity doesn’t matter.For ex A = {1,2,2,3,4,5} is equal set to set B ={1,2,3,3,4,5}
•Equvalent sets – two sets are equvalent if they contain the same number of distinct elements. Ex-set A={a,e,I,o,u} is equalent to {1,2,3,4,5} because both contain 5 diffferent elements
•Subset - The set A is a subset of the set B,denoted A ⊆ B,if and only if every element in A is also in B
• Empty or Null set - The set consisting of no elements is calledthe empty, or null, set,denoted by the symbol O or the empty braces { }.null set is a subset of every set.

(Q)List the subset of {4,6,7} = {4}, {6}, {7},{4, 6}, {4, 7}, {6, 7},{4, 6, 7},{ }
subsets = 2 raise to n where n is the number of elements in the set.

• proper subset - The set A is a proper subset of the set B, denoted A ⊂ B, if and only if A ⊆ B and B ≠ A.
$2^n - 1$ is the quation to find no of proper subset.

•Univeral subset - The universal set U is the set of all items under consideration.

Simple statement – a sentence that is either true or false. eg:It is snowing outside.
Compound statements are combination of simple statements by the use of connectives.(and/or/not)
connectives- The three basic connectives we will consider are conjunction (“and”), disjunction (“or”),and negation (“not”)
The three basic connectives we will consider are conjunction (“and”), disjunction (“or”),and negation (“not”)
we generally start with the letter p, q, and r. For conjunction (“and”), we’ll use the symbol ^, for disjunction (“or”), we’ll use the symbol v, and for negation (“not”), we’ll use the symbol ~.

When we use conjunction in a compound statement, the compound statement is true only if both simple statements are true whereas, when we use disjunction in a compound statement, the compound statement is true if one (or both) of the simple statements is true.

A negation simply turns a statement into its opposite meaning.

p: Sleep is good for you. ~p: Sleep is not good for you.

NAND is “Not AND”.It is the negation of a conjunction. p -^ q.
NOR is “Not OR”.It is the negation of a disjunction p -v q
EOR is “Exclusive OR”. The EOR statement is true whenever exactly one of p or q is true. p _v q

Commutative
A + B = B + A
A • B = B • A
Assosiative

A + (B + C) = (A + B) + C
A • (B • C) = (A • B) • C
Identity

A + 0 = A

A • 1 = A
Distributive Properties
A • (B + C) = (A • B) + (A • C)
A + (B • C) = (A + B) • (A + C)
compliment
A+A’ = 1
A x A’ = 0
Idempotent
A +A = A

A •A = A
0 and 1 Properites
A • 0 = 0
A + 1 = 1