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## Topic 8: Set Language & Notation(4048)



### CHAPTER ANALYSIS



- Relatively straight forward chapter
- 3 key concepts



- Concepts usually tested as a stand-alone topic
- Easy to make careless mistakes if not weary on Notation

WEIGHTAGE

- High overall weightage
- Tested consistently every year
- Typically, an 8m question, 1 question in one of the papers

## Set Language Set Notation

**KEY CONCEPT** 





: Sn =

:

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#### SET LANGUAGE

A set is a well-defined collection of distinct objects



The study of using Mathematical symbols to define things

Symbol	Definition	
E	Containing	
∉	Not containing	
n(A)	Number of elements in a finite set A	



#### SET SPECIFICATION

Sets can be specified in  $\underline{3}$  unique ways

1. Listing

•

- Specified by listing its elements which are separated by commas and enclosed within braces "{ }"
- EX:  $\circ A = \{1, 2, 3, 4\}$
- 2. Description (not very common)
  - Specified by describing its elements in words
  - EX:
    - A = {students playing basketball}
- 3. Set Builder Notation
  - Specified by stating the property that all the elements in the set must satisfy
  - EX:

•  $A = \{x: \text{ prime numbers between } 0 < x < 20\}$ 

#### Tip:

When attempting questions involving the 'Set Builder Notation', always write out all the elements in the set to avoid confusion

 $\begin{cases} S_{6} = 9S_{3} & i \\ A(1-v^{4}) \\ 1-v \\ 1-v \\ A(1-v^{4}) \\ 1-v \\ A(1-v^{4}) \\ 1-v \\ A(1-v^{4}) \\ 1+v^{2} \\ 1+v^{2} \\ 1+v^{2} = 9 \end{cases}$ ▼ Y=1 ... T = Qr = 320

#### Notations relating 2 sets

7+5

all land more) are acceptable

Notations relating 2 sets				
Symbol	Name	Definition		
A = B	Equality	2 sets are equal if and only if they contain the <u>same</u> elements		
Ø <b>OR</b> { }	Empty / Disjoint	A set containing <u>no</u> elements		
<i>A</i> ∩ <i>B</i>	Intersection	The set of elements common in both sets		
$A \cup B$	Union	The set of elements found in <i>A</i> or <i>B</i> or both sets		
ŗ	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	to sigma notation :		

#### **SET NOTATION**

The following list denotes all the standard notations for sets

Symbol	Name	Definition
ξ	Universal Set	Set which contains all the elements relevant to the question
Α'	Complement	All the elements that are not in set A
$A \subseteq B$	Subset	A set <i>A</i> is a subset of <i>B</i> if and only if each element in <i>A</i> is also an element in <i>B</i>
$A \subset B$	Proper Subset	A set <i>A</i> is a proper subset of <i>B</i> if and only if each element in <i>A</i> is also an element in <i>B</i> , but <i>B</i> has at least 1 element that is not in <i>A</i>

Conversely, the notations " $\subsetneq$ " and " $\not\subset$ " implies that the sets are not subsets / proper subsets respectively

\*No former definition is given for these 2 as it is difficult to properly define it without rudimentary Set Theory knowledge







#### Venn Diagrams

A diagram used to present set notations & its relations

Important features of a Venn Diagram

- Each Venn Diagram should be enclosed by a <u>rectangle</u>
- Each set drawn should be a <u>circle</u>





#### Take Note:

When shading your Venn Diagram, shade with parallel lines like the figure on the left

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