1901CS63

ASSIGNMENT - 4 CS206 TANISHQ MALU

Q1

(a.) Let A = { set of airline flight from N.York to Delhi }

B = { set of non-stop airline flight from N.York to Delhi }

Every non-stop airline flight from New York to Delhi is a flight from New York to Delhi.

Thus $\boxed{B \subset A}$

(b.) Let A = { set of people speaking English }

B = { set of people speaking chinese }

Neither A is subset of B nor B is subset of A.

(c.) First set A = { flying squirrels }

B = { living creatures that fly }

$\boxed{A \subset B}$

Q2

(a.) $0 \in \phi$ – **False**

It means that 0 is an element of empty set.
But empty set contains no element

(b.) $\phi \in \{0\}$ – **False**

empty set does not belog to $\{0\}$. it has only one element '0'.

(c.) $\phi \subset \{0\}$ – **True**

(d.) $\{0\} \in \{0\}$ – **False**

(e.) $\{0\} \subset \{0\}$ → **False**

sets are completely identical hence false

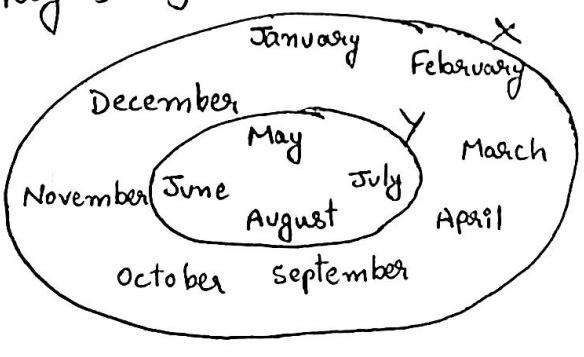
(f.) $\{\phi\} \subseteq \{\phi\}$ – **True**

A set is always an inclusive subset of itself

Q3

S.1 Let X = { set of all months in a year: January, ~~February~~ February, March, April, May, June, July, August, September, October, november, december}

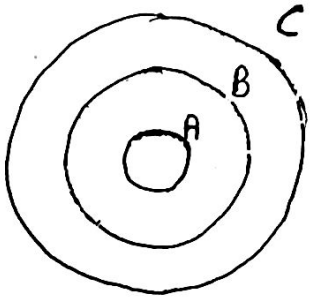
Y = { set without letter R in X : May, June, July, August }



Q4

Sol Given : $A \subset B$ and $B \subset C$

Venn diagram:



Q5

Sol Cardinality = no. of elements present in the set

(a) $\{a\} \Rightarrow 1$

(b) $\{\{a\}\} \Rightarrow 1$

(c.) $\{a, \{a\}\} \Rightarrow 2$

(d.) $\{a, \{a\}, \{a, \{a\}\}\} \Rightarrow 3$

Q6

Sol Let A be a set

To show $\Rightarrow \quad \phi \times A = A \times \phi = \phi$

The cardinality of the output set is equal to product of cardinality of input set.

$|A \times \phi| = |A| \times |\phi| = 0$

But 0 is cardinality of ϕ.

$\therefore \quad \phi \times A = \phi = A \times \phi$

Q7

Given: $A-B = \{1,5,7,8\}$

$B-A = \{2,10\}$

$A \cap B = \{3,6,9\}$

we know,

$A = (A \cap B) \cup (A-B)$

$A = \{3,6,9\} \cup \{1,5,7,8\}$

$\boxed{A = \{1,3,5,6,7,8,9\}}$

similarly $B = (A \cap B) \cup (B-A)$

$B = \{3,6,9\} \cup \{2,10\}$

$\boxed{B = \{2,3,6,9,10\}}$

Q8

Sol The cartesian product $A \times B \times C$ contains triplets of the form $\{(a,b,c) \mid a \in A \wedge b \in B \wedge c \in C\}$

Whereas,

The cartesian product $(A \times B) \times C$ contains doubles of of the form $\{(\{a,b\},c) \mid (a \in A \wedge b \in B) \wedge c \in C\}$

Thus they are not equal as they have different elements in them.

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