

(1)

Assignment No - (2)

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Section - "B"

Dept - (SE)

Subject - Discrete Structure

Submitted to - Sir Abrar

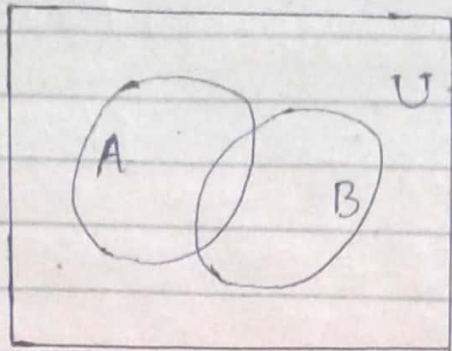
Q1- What is Venn diagram? Explain in detail the Application of Venn diagram.

(ANSWER)

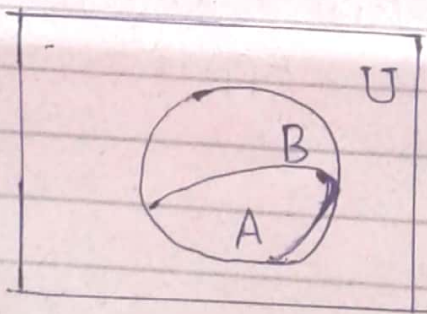
Venn Diagram:-

- ↳ It is a graphical representation of sets by regions in the plane.
- ↳ The Universal Set ~~is~~ is represented by the interior of a rectangle.
- ↳ Other sets are represented by circles lying within the rectangle.

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- ↳ In Venn diagram above, sets A and B intersect each other.
- ↳ In Venn diagram below, set A is totally contained in set B , so $A \subseteq B$.



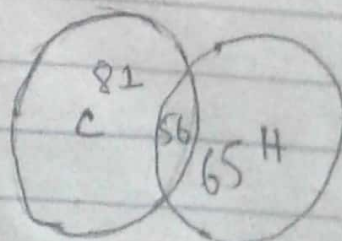
Application of Venn diagrams:

A market researcher collecting data on 100 households finds that

- 81 have cable collection television
- 65 have high speed internet
- 56 have both

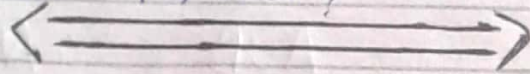
$$81 - 56 = 25$$

$$65 - 56 = 9$$



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- (a) How many households do not have cable television?
- (b) How many households have neither cable television nor high speed internet?
- (c) How many have high speed internet, but not cable television?



Q2:- What is Union? Draw Membership table for Union using different examples.

(ANSWER)

Union:-

↳ A Union is an organization formed by workers who join together and use their strength to have a voice in their workplace. Through their Union, workers have the ability to negotiate from a position of strength with employers over wages, benefits, workplace health and safety, job training and other work-related issues. Unions also serve an important role making sure that management acts fairly and treats its workers with respect.

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↳ Unions are democratic organizations and its leaders are elected by the membership.

Membership table for Union:-
AUB|c:-

A	B	C	AUB	AUB c
0	0	0	0	0
0	0	1	0	0
0	1	0	1	1
0	1	1	1	0
1	0	0	1	1
1	0	1	1	0
1	1	0	1	1
1	1	1	1	0

That being said, looking between my truth table and yours, you did make a mistake in the final column, for $A=1, B=0, C=0$, you should have had a 1 in the entry (as it is the union of the previous two columns and there is a 1 in the corresponding $A|c$ column), but it is otherwise correct. The conclusion should be that the $(AUB)|c$ column should exactly match the $(A|c) \cup (B|c)$ columns proving their equality.

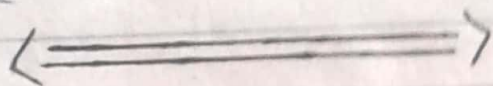
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~~Q2~~ :- Example:-

If $A = \{1, 3, 5, 7, 9\}$ and $B = \{2, 3, 5, 7\}$
What are $A \cup B = ?$

We have

$$A \cup B = \{1, 2, 3, 5, 7, 9\}$$



Q3:- What is intersection? Draw membership table for intersection using different examples.

(ANSWER)

Intersection:-

↳ The intersection of 2 sets A and B is denoted by $A \cap B$. This is the set of all distinct elements that are in both A and B. A useful way to remember the symbol is intersection. We define the intersection of a collection of sets, as the set of all distinct elements that are in all of these sets.

↳ To find the intersection of two given sets A and B is a set which consists of all the elements which are common

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to both A and B. The Symbol for denoting intersection of Sets is " \cap ".

Membership table for intersections

$A \cup (B \cap C)$:

A	B	C	$B \cap C$	$A \cup (B \cap C)$
1	1	1	1	1
1	1	0	0	1
1	0	1	0	1
1	0	0	0	1
0	1	1	1	1
0	1	0	0	0
0	0	1	0	0
0	0	0	0	0

This is the membership table.

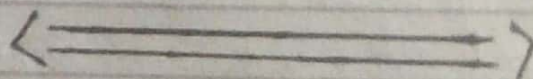
Example:-

IF $A = \{1, 3, 5, 7, 9\}$ and

$B = \{2, 3, 5, 7\}$

What are $A \cap B$?

$A \cap B = \{3, 5, 7\}$



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Q 4:- What is Difference? Draw membership table for Set difference using different examples.

(ANSWER)

Difference:-

- ↳ Difference is defined as the features that make one thing distinct from another or condition of when a change is made.
- ↳ The way in which two or more things which you are comparing are not the same.

Membership table for Set difference:-

Membership table of Set difference are Give below

A	B	A-B	B-A	$A \oplus B$
0	0	0	0	0
0	1	0	1	1
1	0	1	0	1
1	1	0	0	0

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Example:-

- ① Difference between black and white.
- ② Difference between an ape and a Monkey.
- ③ When you want to change the world.

