Mth 202 ASSIGNMENT NO:01 Spring 2022

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Question 1:	Marks: 5

Use truth table to determine the argument form

$p \leftrightarrow q$

$\sim q$

$\therefore \sim p$

is valid or invalid. Also identify premises, conclusion and critical rows.

Solution:

P	Q	$p \leftrightarrow q$	$\sim q$	$\sim p$
T	T	T	F	F
T	F	F	T	F
F	T	F	F	T
F	F	T	T	T

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Since the conclusionis $\sim p$ is true when the premises $p \leftrightarrow q$ and $\sim q$ are True. Therefore, it a valid argument.

Question 2: **Marks: 10**

Given the following universal set U and two of its subsets A and B.

U = Set of first fifteen natural numbers, $A = \{x \in P,\ x \leq 15\}$, $B = \{x \in E,\ 0 \leq x \leq 15\}$

(a) Compute $B - A$ and $B^c \cap A$ and draw Venn diagram for $B - A$ and $B^c \cap A$.

(b) Make a memebership table for $A^c \cup B$ and $A \cap B^c$.

Solution:

$U = \{1, 2, 3, \ldots\ldots 15\}$

$A = \{1, 3, 5, 7, 11, 13\}$

$B = \{2, 4, 6, 8, 10, 12, 14\}$

(a)

$B - A = \{2, 4, 6, 8, 10, 12, 14\} - \{1, 3, 5, 7, 11, 13\}$

$B - A = \{2, 4, 6, 8, 10, 12, 14\}$ and

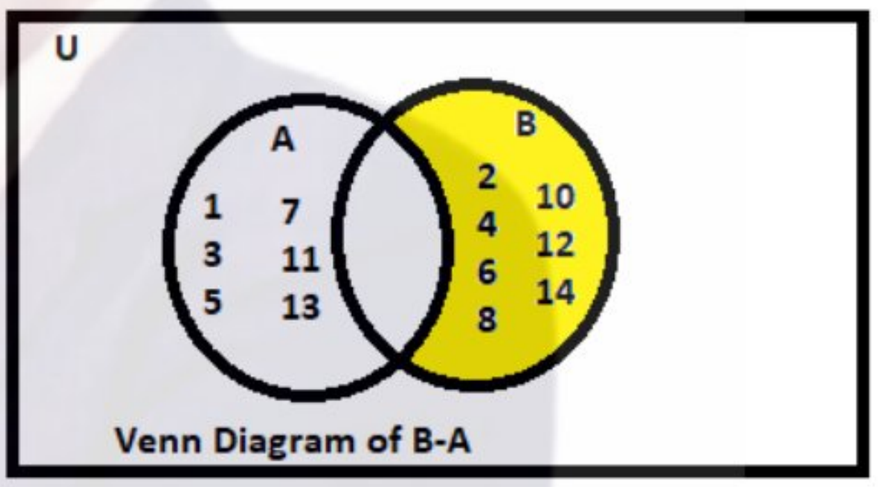
$B^C \cap A$

$B^C = U - B = \{1, 2, 3, \ldots\ldots 15\} - \{2, 4, 6, 8, 10, 12, 14\}$

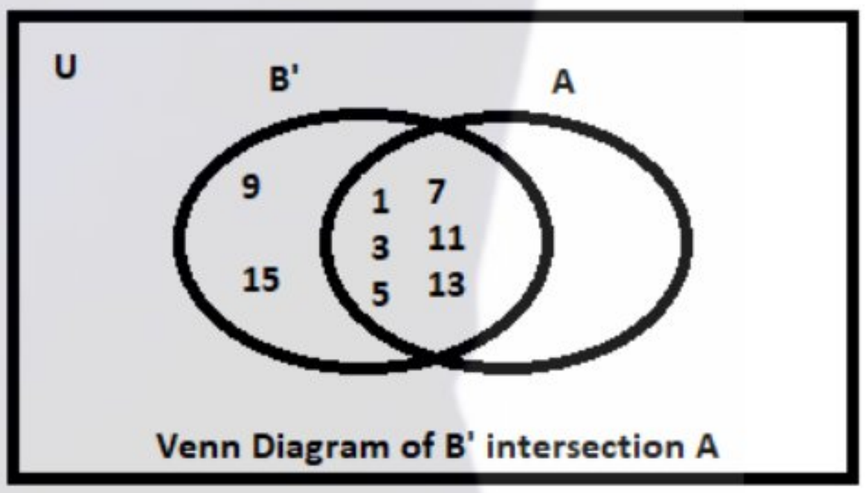
$B^C = \{1, 3, 5, 7, 9, 11, 13, 15\}$

$B^C \cap A = \{1, 3, 5, 7, 9, 11, 13, 15\} \cap \{1, 3, 5, 7, 11, 13\}$

$B^C \cap A = \{1, 3, 5, 7, 11, 13\}$



Venn Diagram of B-A



Venn Diagram of B' intersection A

(b)

U	A	B	A^C	B^C	$A^C \cup B$	$A \cap B^C$
1	1	1	0	0	1	0
1	1	0	0	1	0	1
1	0	1	1	0	1	0
1	0	0	1	1	1	0

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