DLD Assignment 4

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1 QUESTION

The expression $\sim (p \leftrightarrow q)$ is equivalent to:

(A) $p \bigwedge \sim q$

(B) $(\sim p \bigwedge q) \bigvee (\sim q \bigwedge p)$

(C) $p \bigvee q$

(D) $(p \bigwedge \sim q) \bigvee (q \bigwedge \sim p)$

2 ANSWER

$\rightarrow \sim (p \leftrightarrow q)$
$\rightarrow \sim (p \longrightarrow q) \bigwedge (q \longrightarrow p)$
$\rightarrow \sim (p \longrightarrow q) \bigvee \sim (q \longrightarrow p)$
BY DEMORGAN'S LAW;
$(p \bigwedge \sim q) \bigvee (q \bigwedge \sim p)$

3 TRUTH TABLE

p	q	A	B	$\sim p$	$\sim q$	C	D	E
T	T	T	F	F	F	F	F	F
T	F	F	T	F	T	T	F	F
F	T	F	T	T	F	F	T	T
F	F	T	F	T	T	F	F	F

Table 1: Truth Table

Hence proved that
$\sim (p \leftrightarrow q) \equiv (p \bigwedge \sim q) \bigvee (q \bigwedge \sim p)$