

Quiz 1

1. Determine whether the following argument form is valid or not by using the truth table.

If I am healthy, then I eat vegetable. I do not eat vegetable and I am not healthy. Therefore, I eat vegetable if and only if I am not healthy .

Answer:

Let p be "I eat vegetable" and q be "I am healthy."

The above argument can be written in the following form.

$$q \rightarrow p$$

$$\sim p \wedge \sim q$$

$$\therefore p \leftrightarrow \sim q$$

Truth table:

p	q	$\sim p$	$\sim q$	$q \rightarrow p$	$\sim p \wedge \sim q$	$p \leftrightarrow \sim q$
T	T	F	F	T	F	
T	F	F	T	T	F	
F	T	T	F	F	F	
F	F	T	T	T	T	F

←-- critical row:

Notice that the columns 5 and 6 consist of the truth values of premises.

Since the fourth row (which is the only critical row) has true premises with false conclusion, then this argument is **invalid**. ■