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Quiz: Tautologies, Contradictions and Contingent Statements

No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remain marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. *(6 marks)* WITHOUT USING A TRUTH TABLE: Show that the following statement is contingent.

$(\neg A \wedge B) \rightarrow \neg(A \vee B)$

Lets find a valuation that makes the statement true
and " " " " " " false.

If $(\neg A \wedge B)$ is false then the statement is true. For it to be false one of the conjucts need to be false so let B be false. ∴ If B is false then we have a valuation that makes the statement true

If $(\neg A \wedge B)$ is true and $\neg(A \vee B)$ false the statement is false. For the antecedent to be true, both conjunct need to be true, so we assign $\neg A$ to be true, so A is false and B to be true. It follows that with the following valuation the consequent is false since

$\neg(A \vee B) = \neg(F \vee T) = \neg T = F.$