Homework for Unit II, Lesson 5: Truth-Tables (Pt. II)

Truth-functional Truth, Truth-functional Falsity, and Truth-functional Indeterminacy

Construct a truth-table for the following sentences of TL and state whether each is truth-functionally true, truth-functionally false, or truth-functionally indeterminate.

1. ~A ⊃ A
2. J ⊃ (K ⊃ J)
3. (A ≡ ~A) ⊃ ~(A ≡ ~A)
4. (E ≡ H) ⊃ (~E ⊃ ~H)
5. (~B & ~D) ∨ ~(B ∨ D)
6. (J ∨ ~K) ≡ ~~(K ⊃ J)
7. (M ≡ ~N) & (M ≡ N)
8. ~B ⊃ [(B ∨ D) ⊃ D]

Truth-functional Equivalence, Truth-functional Consistency, and Truth-functional Validity

Determine, by constructing truth-tables, which of the following pairs of sentences of TL are truth-functionally equivalent.

1.	~(A & B)	~(A ∨ B)
2.	A ⊃ (B ⊃ A)	(C & ~C) ∨ (A ⊃ A)
3.	K ≡ H	~K ≡ ~H
4.	C & (B ∨ A)	(C & B) ∨ A
5.	(G ⊃ F) ⊃ (F ⊃ G)	(G ≡ F) ∨ (~F ∨ G)
6.	~C ⊃ ~B	B ⊃ C
7.	F ∨ ~(G ∨ ~H)	(H ≡ ~F) ∨ G

Construct truth-tables for each of the following sets of sentences and indicate whether they are truth-functionally consistent or truth-functionally inconsistent.

1. {A ⊃ B, B ⊃ C, A ⊃ C}
2. {B ≡ (J & K), ~J, ~B ⊃ B}
3. {~ (J ∨ (H ⊃ L)), L ≡ (~J ∨ ~H), H ≡ (J ∨ L)}

Construct truth-tables and state whether the following arguments are truth-functionally valid.

1. $A \supset (H \,\&\, J)$
   $J \equiv H$
   $\sim J$
   ———————
   $\sim A$

2. $B \vee (A \,\&\, \sim C)$
   $(C \supset A) \equiv B$
   $\sim B \vee A$
   ———————
   $\sim(A \vee C)$