Hurley: 13th edition, 6.3 Part II #1-15

1.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~ | D | v | B |  | ~ | (D | · | ~ | B) |
| F | T | T | T |  | T | T | F | F | T |
| F | T | F | F |  | F | T | T | T | F |
| T | F | T | T |  | T | F | F | F | T |
| T | F | T | F |  | T | F | F | T | F |

Consistent and logically equivalent

2.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| F | · | M |  | ~ | (F | v | M) |
| T | T | T |  | F | T | T | T |
| T | F | F |  | F | T | T | F |
| F | F | T |  | F | F | T | T |
| F | F | F |  | T | F | F | F |

Inconsistent

3.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~ | K | ⊃ | L |  | K | ⊃ | ~ | L |
| F | T | T | T |  | T | F | F | T |
| F | T | T | F |  | T | T | T | F |
| T | F | T | T |  | F | T | F | T |
| T | F | F | F |  | F | F | T | F |

Consistent

4.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R | v | ~ | S |  | S | · | ~ | R |
| T | T | F | T |  | T | F | F | T |
| T | T | T | F |  | F | F | F | T |
| F | F | F | T |  | T | T | T | F |
| F | T | T | F |  | F | F | T | F |

Inconsistent and contradictory

5.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ~ | A | ≡ | X |  | (X | · | ~ | A) | v | (A | · | ~ | X) |
| F | T | F | T |  | T | F | F | T | F | T | F | F | T |
| F | T | T | F |  | F | F | F | T | T | T | T | T | F |
| T | F | T | T |  | T | T | T | F | T | F | F | F | T |
| T | F | F | F |  | F | F | T | F | F | F | F | T | F |

Consistent and logically equivalent

6.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | ≡ | ~ | G |  | (G | · | H) | v | (~ | G | · | ~ | H) |
| T | F | F | T |  | T | T | T | T | F | T | F | F | T |
| T | T | T | F |  | F | F | T | F | T | F | F | F | T |
| F | T | F | T |  | T | F | F | F | F | T | F | T | F |
| F | F | T | F |  | F | F | F | T | T | F | T | T | F |

Contradictory

7.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (E | ⊃ | C) | ⊃ | L |  | E | ⊃ | (C | ⊃ | L) |
| T | T | T | T | T |  | T | T | T | T | T |
| T | T | T | F | F |  | T | F | T | F | F |
| T | F | F | T | T |  | T | T | F | T | T |
| T | F | F | T | F |  | T | T | F | T | F |
| F | T | T | T | T |  | F | T | T | T | T |
| F | T | T | F | F |  | F | T | T | F | F |
| F | T | F | T | T |  | F | T | F | T | T |
| F | T | F | F | F |  | F | T | F | T | F |

Consistent

8.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | · | (A | v | ~ | E) |  | ~ | A | · | (E | v | ~ | N) |
| T | T | T | T | F | T |  | F | T | F | T | T | F | T |
| T | T | T | T | T | F |  | F | T | F | F | F | F | T |
| T | F | F | F | F | T |  | T | F | T | T | T | F | T |
| T | T | F | T | T | F |  | T | F | F | F | F | F | T |
| F | F | T | T | F | T |  | F | T | F | T | T | T | F |
| F | F | T | T | T | F |  | F | T | F | F | T | T | F |
| F | F | F | F | F | T |  | T | F | T | T | T | T | F |
| F | F | F | T | T | F |  | T | F | T | F | T | T | F |

Inconsistent

9.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M | ⊃ | (K | ⊃ | P) |  | (K | · | M) | ⊃ | P |
| T | T | T | T | T |  | T | T | T | T | T |
| T | F | T | F | F |  | T | T | T | F | F |
| T | T | F | T | T |  | F | F | T | T | T |
| T | T | F | T | F |  | F | F | T | T | F |
| F | T | T | T | T |  | T | F | F | T | T |
| F | T | T | F | F |  | T | F | F | T | F |
| F | T | F | T | T |  | F | F | F | T | T |
| F | T | F | T | F |  | F | F | F | T | F |

Consistent and logically equivalent

10.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| W | ≡ | (B | · | T) |  | W | · | (T | ⊃ | ~ | B) |
| T | T | T | T | T |  | T | F | T | F | F | T |
| T | F | T | F | F |  | T | T | F | T | F | T |
| T | F | F | F | T |  | T | T | T | T | T | F |
| T | F | F | F | F |  | T | T | F | T | T | F |
| F | F | T | T | T |  | F | F | T | F | F | T |
| F | T | T | F | F |  | F | F | F | T | F | T |
| F | T | F | F | T |  | F | F | T | T | T | F |
| F | T | F | F | F |  | F | F | F | T | T | F |

Inconsistent

11.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| G | · | (E | v | P) |  | ~ | (G | · | E) | · | ~ | (G | · | P) |
| T | T | T | T | T |  | F | T | T | T | F | F | T | T | T |
| T | T | T | T | F |  | F | T | T | T | F | T | T | F | F |
| T | T | F | T | T |  | T | T | F | F | F | F | T | T | T |
| T | F | F | F | F |  | T | T | F | F | T | T | T | F | F |
| F | F | T | T | T |  | T | F | F | T | T | T | F | F | T |
| F | F | T | T | F |  | T | F | F | T | T | T | F | F | F |
| F | F | F | T | T |  | T | F | F | F | T | T | F | F | T |
| F | F | F | F | F |  | T | F | F | F | T | T | F | F | F |

Contradictory

12.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R | · | (Q | v | S) |  | (S | v | R) | · | (Q | v | R) |
| T | T | T | T | T |  | T | T | T | T | T | T | T |
| T | T | T | T | F |  | F | T | T | T | T | T | T |
| T | T | F | T | T |  | T | T | T | T | F | T | T |
| T | F | F | F | F |  | F | T | T | T | F | T | T |
| F | F | T | T | T |  | T | T | F | T | T | T | F |
| F | F | T | T | F |  | F | F | F | F | T | T | F |
| F | F | F | T | T |  | T | T | F | F | F | F | F |
| F | F | F | F | F |  | F | F | F | F | F | F | F |

Consistent

13.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | · | (K | v | J) |  | (J | · | H) | v | (H | · | K) |
| T | T | T | T | T |  | T | T | T | T | T | T | T |
| T | T | T | T | F |  | F | F | T | T | T | T | T |
| T | T | F | T | T |  | T | T | T | T | T | F | F |
| T | F | F | F | F |  | F | F | T | F | T | F | F |
| F | F | T | T | T |  | T | F | F | F | F | F | T |
| F | F | T | T | F |  | F | F | F | F | F | F | T |
| F | F | F | T | T |  | T | F | F | F | F | F | F |
| F | F | F | F | F |  | F | F | F | F | F | F | F |

Consistent and logically equivalent

14.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Z | · | (C | ≡ | P) |  | C | ≡ | (Z | · | ~ | P) |
| T | T | T | T | T |  | T | F | T | F | F | T |
| T | F | T | F | F |  | T | T | T | T | T | F |
| T | F | F | F | T |  | F | T | T | F | F | T |
| T | T | F | T | F |  | F | F | T | T | T | F |
| F | F | T | T | T |  | T | F | F | F | F | T |
| F | F | T | F | F |  | T | F | F | F | T | F |
| F | F | F | F | T |  | F | T | F | F | F | T |
| F | F | F | T | F |  | F | T | F | F | T | F |

Inconsistent

15.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Q | ⊃ | ~ | (K | v | F) |  | (K | · | Q) | v | (F | · | Q) |
| T | F | F | T | T | T |  | T | T | T | T | T | T | T |
| T | F | F | T | T | F |  | T | T | T | T | F | F | T |
| T | F | F | F | T | T |  | F | F | T | T | T | T | T |
| T | T | T | F | F | F |  | F | F | T | F | F | F | T |
| F | T | F | T | T | T |  | T | F | F | F | T | F | F |
| F | T | F | T | T | F |  | T | F | F | F | F | F | F |
| F | T | F | F | T | T |  | F | F | F | F | T | F | F |
| F | T | T | F | F | F |  | F | F | F | F | F | F | F |

Contradictory