SOLUTIONS TO SELECTED EXERCISES

EXERCISES FOR SECTION 3.3

2. (A & B) is true under interpretation I_1 <A:T, B:T>
   (A & B) is false under interpretation I_2 <A:T, B:F>

3. ~~A is true under interpretation I_3 <A:T>
   ~~A is false under interpretation I_4 <A:F>

4. (~A ∨ B) is true under interpretation I_5 <A:F, B:T>
   (~A ∨ B) is false under interpretation I_6 <A:T, B:F>

5. (~A ∨ ~~B) is true under interpretation I_7 <A:F, B:T>
   (~A ∨ ~~B) is false under interpretation I_8 <A:T, B:F>

6. ~(A ∨ B) is true under interpretation I_9 <A:F, B:F>
   ~(A ∨ B) is false under interpretation I_{10} <A:T, B:T>

8. ~(A & ~~B) is true under interpretation I_{11} <A:F, B:F>
   ~(A & ~~B) is false under interpretation I_{12} <A:T, B:T>

9. (A → B) is true under interpretation I_{13} <A:F, B:F>
   (A → B) is false under interpretation I_{14} <A:T, B:F>

10. ~(A → B) is true under interpretation I_{15} <A:T, B:F>
    ~(A → B) is false under interpretation I_{16} <A:T, B:T>

11. (~A → B) is true under interpretation I_{17} <A:T, B:F>
    (~A → B) is false under interpretation I_{18} <A:F, B:F>

12. (A → ~B) is true under interpretation I_{19} <A:F, B:F>
    (A → ~B) is false under interpretation I_{20} <A:T, B:T>

13. (A ↔ B) is true under interpretation I_{21} <A:F, B:F>
    (A ↔ B) is false under interpretation I_{22} <A:T, B:F>

14. ~(A ↔ B) is true under interpretation I_{23} <A:T, B:F>
    ~(A ↔ B) is false under interpretation I_{24} <A:T, B:T>

16. (A → ~B) is true under interpretation I_{25} <A:F, B:F>
    (A → ~B) is false under interpretation I_{26} <A:T, B:T>

    Note: This problem is identical to #12.

17. $(A \vee (B \& C))$ is true under interpretation I_{27} <A:T, B:F, C:F>
$(A \vee (B \& C))$ is false under interpretation I_{28} <A:F, B:T, C:F>

18. $((A \vee B) \& C)$ is true under interpretation I_{29} <A:F, B:T, C:T>
$((A \vee B) \& C)$ is false under interpretation I_{30} <A:F, B:F, C:F>

19. $(\sim A \vee \sim(B \& C))$ is true under interpretation I_{31} <A:F, B:F, C:F>
$(\sim A \vee \sim(B \& C))$ is false under interpretation I_{32} <A:T, B:T, C:T>

20. $(B \rightarrow (\sim C \vee A))$ is true under interpretation I_{33} <A:F, B:F, C:F>
$(B \rightarrow (\sim C \vee A))$ is false under interpretation I_{34} <A:F, B:T, C:T>

21. $(\sim(C \& B) \rightarrow D)$ is true under interpretation I_{35} <B:T, C:T, D:F>
$(\sim(C \& B) \rightarrow D)$ is false under interpretation I_{36} <B:T, C:F, D:F>

22. $\sim[D \rightarrow (B \vee \sim A)]$ is true under interpretation I_{37} <A:T, B:F, D:T>
$\sim[D \rightarrow (B \vee \sim A)]$ is false under interpretation I_{38} <A:T, B:T, D:F>

24. $((B \rightarrow C) \rightarrow A)$ is true under interpretation I_{39} <A:T, B:F, C:F>
$((B \rightarrow C) \rightarrow A)$ is false under interpretation I_{40} <A:F, B:F, C:F>

25. $((A \& B) \vee \sim(C \vee \sim D))$ is true under interpretation I_{41} <A:T, B:T, C:F, D:F>
$((A \& B) \vee \sim(C \vee \sim D))$ is false under interpretation I_{42} <A:T, B:F, C:T, D:T>

26. $[\sim(A \rightarrow \sim B) \& (\sim C \vee \sim\sim D)]$ is true under interpretation I_{43} <A:T, B:T, C:F, D:F>
$[\sim(A \rightarrow \sim B) \& (\sim C \vee \sim\sim D)]$ is false under interpretation I_{44} <A:F, B:T, C:T, D:T>