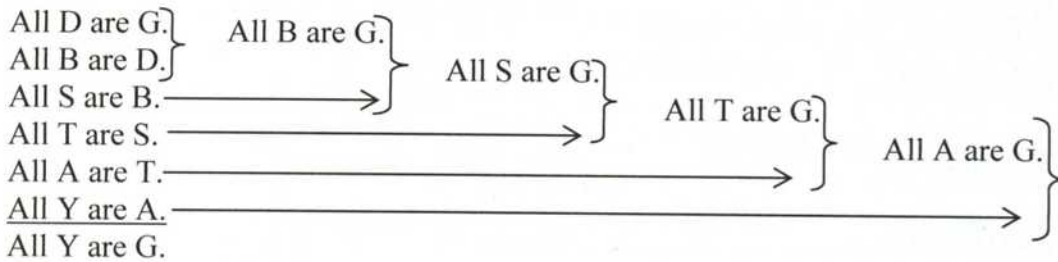


10. All animals that belong to me are animals I trust.
 All dogs are animals that gnaw bones.
 All animals I admit to my study are animals that beg when told to do so.
 All the animals in the yard are animals that belong to me.
 All animals I trust are animals I admit into my study.
 All animals that are willing to beg when told to do so are dogs.
 Therefore, all the animals in the yard are animals that gnaw bones.

All A are T.
 All D are G.
 All S are B.
 All Y are A.
 All T are S.
All B are D.
 All Y are G.



Exercise 6.1

Part I

- | | |
|---------------------|-----------------------------|
| 1. $\sim C$ | 7. $L \equiv B$ |
| 2. $A \cdot \sim N$ | 8. $R \supset M$ |
| 3. $S \vee T$ | 9. $G \supset A$ |
| 4. $H \cdot B$ | 10. $C \supset P$ |
| 5. $C \supset L$ | 11. $\sim B \vee W$ |
| 6. $L \supset C$ | 12. $M \supset (L \cdot B)$ |

Exercise 6.1

13. $M \cdot (E \vee D)$
14. $(M \cdot E) \vee D$
15. $\sim(J \cdot P)$
16. $\sim J \cdot \sim P$
17. $N \vee S$
18. $\sim(F \vee M)$
19. $\sim(F \vee M)$ or $\sim F \cdot \sim M$
20. $\sim F \vee \sim M$
21. $B \supset (K \supset P)$
22. $(B \supset K) \supset P$
23. $T \equiv \sim(R \vee C)$
24. $S \supset (M \vee B)$
25. $\sim R \vee (M \supset P)$
26. $(R \vee M) \supset \sim(C \vee E)$
27. $(K \cdot J) \supset (F \vee P)$
28. $(\sim P \cdot \sim C) \supset M$
29. $S \cdot (N \vee J)$
30. $(S \cdot N) \vee J$
31. $(T \cdot B) \vee (\sim Z \cdot \sim K)$
32. $(A \supset B) \cdot (S \cdot M)$
33. $(J \vee B) \cdot \sim(J \cdot B)$
34. $\sim H \cdot [I \supset (B \vee C)]$
35. $\sim[I \cdot (S \vee P)]$
36. $\sim[H \vee (A \cdot T)]$
37. $S \supset [D \supset (P \cdot M)]$
38. $T \supset [D \supset (S \supset K)]$
39. $\sim[(T \cdot M) \vee (B \cdot L)]$
40. $\sim[(K \vee S) \cdot (L \vee B)]$
41. $I \supset P$
42. $P \supset I$
43. $I \equiv P$
44. $(U \supset D) \supset (S \supset J)$
45. $(L \cdot A) \equiv (J \cdot T)$
46. $\sim[(A \supset N) \cdot (S \supset C)]$
47. $M \supset (E \supset N)$
48. $[B \supset \sim(G \vee R)] \supset (D \supset C)$
49. $[(C \cdot J) \equiv K] \supset \sim(B \vee S)$
50. $(P \supset N) \cdot [(C \cdot A) \supset J]$

Part II

1. $R \vee F$
2. $P \supset S$
3. $H \cdot E$
4. $\sim(H \vee S)$
5. $\sim(O \cdot Y)$
6. $H \supset (P \vee Q)$

- | | |
|------------------------------------|---|
| 7. $S \supset G$ | 14. $(M \vee C) \supset P$ |
| 8. $C \supset (U \cdot A)$ | 15. $(C \cdot O) \vee (S \cdot B)$ |
| 9. $O \supset I$ | 16. $[(T \cdot L) \supset H] \cdot (H \supset I)$ |
| 10. $A \supset (\sim N \supset M)$ | 17. $E \cdot [M \equiv (A \cdot \sim V)]$ |
| 11. $I \supset (M \cdot N)$ | 18. $(E \supset H) \cdot [H \supset (\sim D \cdot P)]$ |
| 12. $\sim H \vee (P \vee L)$ | 19. $(B \supset M) \cdot [(M \cdot I) \supset (C \cdot P)]$ |
| 13. $(C \cdot K) \equiv P$ | 20. $[C \supset (T \cdot B)] \cdot [B \supset (\sim A \cdot \sim L)]$ |

Part III

- | | |
|------------|-------------|
| 1. WFF | 6. WFF |
| 2. Not WFF | 7. Not WFF |
| 3. Not WFF | 8. Not WFF |
| 4. WFF | 9. WFF |
| 5. Not WFF | 10. Not WFF |

Exercise 6.2

Part I

- | | |
|---------------|---------------|
| 1. Dot | 6. Tilde |
| 2. Horseshoe | 7. Horseshoe |
| 3. Tilde | 8. Triple bar |
| 4. Triple bar | 9. Dot |
| 5. Wedge | 10. Wedge |

Part II

- | | | | |
|--|-------|--|-------|
| 1. $\sim H$ | False | 7. $W \supset E$ | True |
| 2. $N \cdot L$ | True | 8. $L \equiv F$ | False |
| 3. $F \vee L$ | True | 9. $\sim(A \vee W)$ | True |
| 4. $H \cdot \sim N$ | False | 10. $H \supset (C \vee E)$ | True |
| 5. $E \vee C$ | True | 11. $(L \cdot E) \vee (N \cdot \sim E)$ | True |
| 6. $N \supset A$ | False | 12. $(L \supset A) \equiv (C \supset W)$ | True |
| 13. $\sim(E \vee F) \supset (H \cdot L)$ | True | 15. $C \cdot [L \supset (W \vee A)]$ | False |
| 14. $\sim C \vee (N \cdot E)$ | False | | |

Exercise 6.3

Part III

- | | |
|-----------|-----------|
| 1. False | 14. True |
| 2. True | 15. False |
| 3. True | 16. True |
| 4. False | 17. True |
| 5. True | 18. True |
| 6. True | 19. True |
| 7. False | 20. False |
| 8. False | 21. False |
| 9. True | 22. True |
| 10. False | 23. True |
| 11. True | 24. False |
| 12. False | 25. True |
| 13. True | |

Part IV

- | | |
|-----------------|-----------|
| 1. True | 9. False |
| 2. Undetermined | 10. True |
| 3. False | 11. False |
| 4. Undetermined | 12. True |
| 5. True | 13. False |
| 6. True | 14. True |
| 7. Undetermined | 15. False |
| 8. False | |

Exercise 6.3

Part I

- | | |
|-----------------------|------------------------|
| 1. Tautologous | 9. Contingent |
| 2. Contingent | 10. Self-contradictory |
| 3. Self-contradictory | 11. Self-contradictory |
| 4. Contingent | 12. Tautologous |
| 5. Self-contradictory | 13. Self-contradictory |
| 6. Tautologous | 14. Tautologous |
| 7. Tautologous | 15. Contingent |
| 8. Contingent | |

Part II

- | | |
|-------------------------|-------------------------|
| 1. Logically equivalent | 9. Logically equivalent |
| 2. Inconsistent | 10. Inconsistent |
| 3. Consistent | 11. Contradictory |
| 4. Contradictory | 12. Consistent |

- | | |
|-------------------------|--------------------------|
| 5. Logically equivalent | 13. Logically equivalent |
| 6. Contradictory | 14. Inconsistent |
| 7. Consistent | 15. Contradictory |
| 8. Inconsistent | |

Part III

- Carlson's prediction is false (self-contradictory).
- Music is not dropped from the curriculum, and the students will become cultural philistines.
- Thomas is not correct; the two statements are not logically equivalent.
- It is possible that both astronomers are correct. If they are, a supernova will not occur within 10 light years of the earth.
- Martinez's statement is tautologous; therefore, she has told us nothing about taxes, educational costs, or welfare.
- It is possible that Goodbody is correct in his assessment. If so, Isuzu is not the lowest priced. We cannot conclude anything about Mitsubishi or Toyota.
- It is possible that both stock brokers are correct. If they are, then Datapro will cut back its work force. We cannot conclude anything about Netmark and Compucel.
- Eric's beliefs are inconsistent; therefore, they do not make sense.
- It is possible that all three witnesses told the truth. If so, Lefty did not enter the bank, Howard pulled a gun, and Conrad collected the money.
- It is possible that Nicole's philosophy makes sense. If it does, then the mind is not identical to the brain, personal freedom exists, and humans are responsible for their actions.

Exercise 6.4

Part I

- | | |
|--|--|
| 1. $\frac{N \supset S}{\sim N \supset \sim S}$ (Invalid) | 2. $\frac{B}{B \vee A}$ (Valid) |
| 3. $\frac{F \supset G}{\frac{G \supset W}{F \supset W}}$ (Valid) | 7. $\frac{P \vee S}{\frac{P}{\sim S}}$ (Invalid) |

Exercise 6.5

$$\begin{array}{l} 4. \ D \supset W \\ \quad \underline{D} \\ \quad W \end{array} \quad (\text{Valid})$$

$$\begin{array}{l} 5. \ R \supset \sim C \\ \quad \underline{W \supset \sim C} \\ \quad R \supset W \end{array} \quad (\text{Invalid})$$

$$\begin{array}{l} 6. \ \underline{D} \\ \quad P \supset (R \supset P) \end{array} \quad (\text{Valid})$$

$$\begin{array}{l} 8. \ M \supset C \\ \quad \underline{\sim C \cdot M} \\ \quad S \end{array} \quad (\text{Valid})$$

$$\begin{array}{l} 9. \ \underline{\sim A \vee \sim M} \\ \quad \sim (A \vee M) \end{array} \quad (\text{Invalid})$$

$$\begin{array}{l} 10. \ (R \supset Q) \cdot (\sim R \supset P) \\ \quad \underline{R \vee \sim R} \\ \quad Q \vee P \end{array} \quad (\text{Valid})$$

Part II

- | | |
|-------------|-------------|
| 1. Valid | 11. Invalid |
| 2. Invalid | 12. Valid |
| 3. Valid | 13. Valid |
| 4. Valid | 14. Valid |
| 5. Invalid | 15. Invalid |
| 6. Valid | 16. Invalid |
| 7. Invalid | 17. Valid |
| 8. Invalid | 18. Invalid |
| 9. Valid | 19. Valid |
| 10. Invalid | 20. Invalid |

Exercise 6.5

Part I

- | | |
|------------|-------------|
| 1. Valid | 8. Invalid |
| 2. Invalid | 9. Valid |
| 3. Valid | 10. Invalid |
| 4. Invalid | 11. Valid |
| 5. Valid | 12. Valid |
| 6. Invalid | 13. Valid |
| 7. Valid | 14. Invalid |
| | 15. Invalid |

Part II

- | | |
|-----------------|-----------------|
| 1. Inconsistent | 6. Inconsistent |
| 2. Consistent | 7. Inconsistent |
| 3. Inconsistent | 8. Consistent |
| 4. Consistent | 9. Inconsistent |
| 5. Consistent | 10. Consistent |