

✓ Simplify the following Boolean expressions. Write the theorems.

1. $X+XY$

2. $ABC+AB$

3. $A\bar{B}C+ABC+A\bar{C}$

4. $A\bar{B}+AB$

5. $A+A+AB+C$

6. $XYZ+XY$

7. $A\bar{B}+AB+A$

8. $PQR+PQ+P$

9. $\bar{X}+X.Y$

10. $A+\bar{A}B$

11. $\bar{P}.\bar{P}+Q$

12. $X.(X+\bar{Y})$

13. $(A+B)(A+\bar{B})$

14. $(\bar{X}+\bar{Y})(\bar{X}+Y)$

15. $(\bar{M}+N)(\bar{M}+\bar{N})$

16. $XYZ + X\bar{Y}Z + \bar{X}Y\bar{Z}$

17. $A + \overline{A.B}$

18. $A.\overline{A.B}$

19. $\bar{X}.\overline{X+Y}$

20. $\overline{X(X+Y)}$

21. $X.\overline{X.Y}$

22. $\overline{(A+B)} \overline{(A.B)}$

23. $\overline{\bar{A}\bar{B}\bar{C}}$

24. $\overline{(X\bar{Y}Z)} + Y$

25. $X + \bar{X}Y$

26. $A\bar{B}C + AB$

27. $XY\bar{Z} + X\bar{Y}$

28. $A \cdot (\bar{A} + B)$

29. $\bar{A}BC + \bar{A}\bar{B}C + \bar{A}B\bar{C}$

30. $XYZ + \bar{X}YZ + XY\bar{Z} + X\bar{Y}Z$

✓ Simplify the following Boolean expressions using K-maps.

1) $(A+B+C) \cdot (A+\bar{B}+\bar{C}) \cdot (A+\bar{B}+C) \cdot (A+B+\bar{C})$

2) $\bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + A\bar{B}\bar{C} + A\bar{B}C + \bar{A}BC$

3) $PQR + P\bar{Q}\bar{R} + \bar{P}QR + P\bar{Q}R + P\bar{Q}\bar{R}$

4) $ABC + A\bar{B}\bar{C} + \bar{A}\bar{B}C + A\bar{B}C + \bar{A}BC$