Digital Logic Design
Daily Practice Problems
Day - 3

31. $A + \bar{A}B + \bar{A}\,\bar{B}C + \bar{A}\,\bar{B}\bar{C}\,D + \cdots . =$

(a) A + B + C + ...

(b) $\bar{A} + \bar{B} + \bar{C} + \bar{D} + \cdots$

(c) 1

(d) 0

32. **The complement of a Boolean expression is obtained by**

(a) interchanging all 0s and 1s

(b) interchanging all 0s and 1s, all + and '·' signs

(c) interchanging all 0s and 1s, all + and '·' signs and complementing all the variables

(d) interchanging all + and '·' signs and complementing all the variables

33. **In function W, X, Y and Z are as follows**

$$W = R + \bar{P}Q + \bar{R}S$$

$$X = PQ\bar{R}\bar{S} + \bar{P}\bar{Q}\bar{R}\bar{S} + P\bar{Q}\bar{R}\bar{S}$$

$$Y = RS + \overline{PR + P\bar{Q} + \bar{P}\bar{Q}}$$

$$Z = R + S + \overline{PQ + \bar{P}\bar{Q}\bar{R} + P\bar{Q}\bar{S}}$$

Then

(a) $W = Z, X = \bar{Z}$

(b) $W = Z, X = Y$

(c) $W = Y$

(d) $W = Y = \bar{Z}$

34. **Consider the Boolean expression**
$ABCD + A\,\overline{B}\,CD + \overline{A}\,BCD + \overline{A}\,C\,\overline{B}\,D$ **. The simplified form of X is**

(a) $\overline{C} + \overline{D}$ (b) BC (c) CD (d) BC

35. **What does the Boolean expression**
$AD + ABCD + ACD + \bar{A}\,B + ACD + \bar{A}\bar{B}$,
on minimization result into?

(a) A + D (b) $AD + \bar{A}$ (c) AD (d) $\bar{A} + D$

36. **The minimized form of the logical expression $(\bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}BC + AB\bar{C})$ is**

(a) $\bar{A}\bar{C} + B\bar{C} + \bar{A}B$

(b) $A\bar{C} + \bar{B}C + \bar{A}B$

(c) $\bar{A}C + \bar{B}C + \bar{A}B$

(d) $A\bar{C} + \bar{B}C + A\bar{B}$

37. **The reduced form of the Boolean expression $A[B + C(\overline{AB + AC})]$ is**

(a) $\bar{A}B$ (b) $A\bar{B}$ (c) AB (d) $AB + B\bar{C}$

38. **The minimized form of the logical expression $(\bar{A}\,\bar{B}\,\bar{C} + \bar{A}\,B\,\bar{C} + \bar{A}\,B\,C + A\,B\,\bar{C})$ is**

(a) $\bar{A}\,\bar{C} + B\,\bar{C} + \bar{A}\,B$

(b) $A\,\bar{C} + \bar{B}\,C + \bar{A}\,B$

(c) $\bar{A}\,C + \bar{B}\,C + \bar{A}\,B$

(d) $A\,\bar{C} + \bar{B}\,C + A\,\bar{B}$

39. **If X = 1 in the logic equation**

$$[X + Z\{\overline{Y} + (\overline{Z} + X\overline{Y})\}]\{\overline{X} + \overline{Z}(X + Y)\} = 1$$ **then**

(a) Y = Z (b) $Y = \overline{Z}$ (c) Z = 1 (d) Z = 0

40. **The simplified form of the Boolean expression $Y = (\overline{A}\ B\ C + D)(\overline{A}\ D + \overline{B}\ \overline{C})$ can be written as**

(a) $\overline{A}\ D + \overline{B}\ \overline{C}\ D$

(b) $A\ D + B\ \overline{C}\ D$

(c) $(\overline{A} + D)(\overline{B}\ C + \overline{D})$

(d) $A\ \overline{D} + B\ C\ \overline{D}$

41. **The simplified form of a logic function $W = x(y + z(\overline{xy + xz}))$ is**

(a) $x\,\bar{y}$ (b) $\bar{x}\bar{y}$ (c) $\bar{x}y$ (d) xy

42. **Let A*B=A + $\overline{B}$ and y = A * B then the value of z = $\bar{y}$ * $\overline{B}$ is**

(a) A (b) 1 (c) B (d) $\bar{B}$

43. **The simplified form of the Boolean expression AB + A(B + C) + B (B + C) is given By**

(a) AB + AC (b) B + AC (c) BC + AC (d) AB + C

44. **P, Q, R are Boolean variables, then $(P + \overline{Q})(P.\overline{Q} + P.R)(\overline{P}.\overline{R} + \overline{Q})$ simplifies to**

(a) $P.\overline{Q}$ (b) $P.\overline{R}$ (c) $P.\overline{Q} + R$ (d) $P.\overline{R} + Q$

45. **The simplified SOP (Sum of Product) form of the Boolean expression**
$(P + \bar{Q} + \bar{R}).(P + \bar{Q} + R).(P + Q + \bar{R})$
(a) $(P + \bar{Q} + \bar{R})$ (b) $(P + \bar{Q}.\bar{R})$ (c) $(\bar{P}.Q + R)$ (d) $(P.Q + R)$

46. **Which of the following Boolean function equation are true?**

(i) $xy + x'z + yz = xy + x'z$

(ii) $(x + y)(x' + z)(y + z) = (x + y)(y' + z)$

(a) only (i)
(b) only (ii)
(c) Both (i) and (ii)
(d) Neither (i) Nor (ii)

47. The Boolean equation $X = [(A + \overline{B})(B + C)]B$ can be simplified to

(a) $X = \overline{A}B$

(b) $X = A\overline{B}$

(c) $X = AB$

(d) $X = \overline{A}\,\overline{B}$

48. **The simplified expression of the Boolean function**

$F = \overline{\overline{AB}\,(CD + \bar{E}F)(\overline{AB} + \overline{CD})}$ **is**

(a) $AB + (\bar{C} + \bar{D})(\bar{E} + \bar{F})$

(b) $AB + (C + D)(E + \bar{F})$

(c) $\bar{A}\bar{B} + (\bar{C} + \bar{D})(E + \bar{F})$

(d) $AB + (\bar{C} + \bar{D})(E + \bar{F})$

49. $f(A, B, C) = [A + B + AB]\,[A + C + AC]$

(a) AB + C (b) A + B (c) A +C (d) A + BC

50. Simplified form of the logic expression $(A+\overline{B}+C)(A+\overline{B}+\overline{C})(A+B+C)$ is

(a) $\overline{A}B+\overline{C}$
(b) $A+\overline{B}C$
(c) A
(d) $AB+\overline{C}$

51. **The Boolean function $x'y'+xy+x'y$ is equivalent to**

(A) $x'+y'$ (B) $x+y$ (C) $x+y'$ (D) $x'+y$

52. **The Boolean expression**

$\bar{X}\,Y\,\bar{Z} + \bar{X}\,\bar{Y}\,Z + X\,Y\,\bar{Z} + X\,\bar{Y}\,Z + X\,Y\,Z$ **can be simplified to**

(A) $X\,\bar{Z} + \bar{X}\,Z + Y\,Z$

(B) $X\,Y + \bar{Y}\,Z + Y\,\bar{Z}$

(C) $\bar{X}\,Y + Y\,Z + X\,Z$

(D) $\overline{X\,Y} + Y\,\bar{Z} + \bar{X}\,Z$

53. **Let * be defined as $x * y = \bar{x} + y$, Let $z = x * y$. Value $z * x$ is**

(A) $\bar{x} + y$ (B) x (C) 0 (D) 1

54. Logic function $A\overline{B}D + A\overline{B}\,\overline{D}$ can be reduced to :

(a) $\overline{A}\,\overline{B}$ (b) $A\overline{B}$

(c) $\overline{B}\,\overline{D}$ (d) $A\overline{D}$

55. The logic function $f(A, B, C, D) = (\overline{A} + BC)(B + CD)$ can be expressed to :

(a) $\overline{A}\,B + BC + \overline{A}\,CD + BCD$

(b) $AB + A\overline{B} + A\overline{C}\,D + BCD$

(c) $AB + \overline{A}\overline{B} + \overline{A}CD + B\overline{C}D$

(d) $A\overline{B} + \overline{A}\,B + \overline{A}\,CD + BCD$

56. The Boolean expression $\overline{(a+\bar{b}+c+\bar{d})+(b+\bar{c})}$ simplifies to

(A) 1 (B) $\overline{a.b}$ (C) a.b (D) 0

57. The Boolean expression $XY+(X'+Y')Z$ is equivalent to

(A) $XYZ'+X'Y'Z$

(B) $X'Y'Z'+XYZ$

(C) $(X+Z)(Y+Z)$

(D) $(X'+Z)(Y'+Z)$

58. The Boolean expression $(X+Y)(X+\bar{Y})+\overline{\bar{X}\bar{Y}+\bar{X}}$ simplifies to

(A) X (B) Y (C) XY (D) X+Y

59. If $X = 1$ in the logic equation

$$\left[X + Z\left\{\overline{Y} + \left(\overline{Z} + X\overline{Y}\right)\right\}\right]\left\{\overline{X} + \overline{Z}(X + Y)\right\} = 1, \text{ then}$$

(A) $Y = Z$ (B) $Y = \overline{Z}$ (C) $Z = 1$ (D) $Z = 0$

60. The Boolean expression $AC + B\overline{C}$ is equivalent to

(A) $\overline{A}C + B\overline{C} + AC$

(B) $\overline{B}C + AC + B\overline{C} + \overline{A}C\overline{B}$

(C) $AC + B\overline{C} + \overline{B}C + ABC$

(D) $ABC + \overline{A}B\overline{C} + A\overline{B}C + AB\overline{C}$