

- An AND gate can be imagined as
 - switches connected in series
 - switches connected in parallel
 - MOS transistors connected in series
 - none of the above
- Which of the following statement is correct?
 - The output of a NOR gate is high if all of its input are high.
 - The output of a NOR gate is low if all of its inputs are low.
 - The output of a NOR gate is high if all of its inputs are low.
 - The output of a NOR gate is high if only one of its inputs is low.
- Which of the following is functionally complete set?
 - AND, OR
 - AND, XOR
 - NOT, OR
 - AND, OR, NOT
- Which of the following boolean algebra expression is incorrect?
 - $A + \bar{A} = A + B$
 - $A + AB = B$
 - $(A+B)(A+C) = A + BC$
 - $(A + \bar{B})(A + B) = A$
- Which of the following boolean algebra expression is incorrect?
 - $\overline{ABC} + BC + AC = C$
 - $(A+B)[\overline{A(\bar{B} + \bar{C})}] + \bar{B}\bar{C} + \bar{A}\bar{C} = 1$
 - $AB + \bar{A}C + BC = AB + AC$
 - $AB + A = \bar{C} = B$
- Which of the following boolean algebra expression is incorrect?
 - $AB + A(B+C) + B(B+C) = B+AC$
 - $[A\bar{B} + (C+B\bar{D}) + \bar{A}\bar{B}]C = B\bar{C}$
 - $\overline{A\bar{B}(C+\bar{D})} = \bar{A} + B + \bar{C}D$
 - $(A+C)(ABC+ACD) = ABC+ACD$
- Which of the following boolean algebra expression is incorrect?
 - $AB + \bar{A}\bar{B}C + A = A + BC$
 - $\bar{A}B + \bar{A}B\bar{C} + \bar{A}BCD + \bar{A}B\bar{C}\bar{D}E = \bar{A}B$
 - $AB + (\bar{A} + \bar{B})C + AB = AB + A\bar{C} + B\bar{C}$
 - $(A + \bar{A})(AB + AB\bar{C}) = AB$
- The boolean expression $(A+C)(\bar{A}\bar{B} + AC)(\bar{A}\bar{C} + \bar{B})$ simplified to
 - $AB + \bar{A}C$
 - $\bar{A}B + BC$
 - $AB + BC$
 - $A\bar{B}$
- Consider the following sequence of instructions:

$$a = a \oplus b$$

$$b = a \oplus b$$

$$a = b \oplus a$$
 This sequence
 - retains the values of a and b
 - swaps a and b
 - complements the values of a and b
 - negates values of a and b and then swaps h
- Consider a set $x = \{a, b, c, d\}$. The number of binary operations that can be defined on x is

- (a) 4^2
- (b) 2^4
- (c) 2^{16}
- (d) 4^{16}

11. Consider the boolean expression

$$\bar{x}y\bar{z} + \bar{x}\bar{y}z + x(y+z).$$

The equivalent product of sums form is

- (a) $\bar{x}y\bar{z} + \bar{x}\bar{y}z + x y + x z$
- (b) $(x + \bar{y} + z)(x + y + \bar{z})(x + y + z)$
- (c) $(\bar{y} + \bar{z})(\bar{x} + y + z)$
- (d) $(y + z)(x + \bar{y} + z)$

12. Which of the following logical expression is incorrect?

- (a) $(a+b)(a+b)' = a$
- (b) $ab + a'c + bc = ab + a'c$
- (c) $(a+b)' = a'b'$
- (d) $a + a'b = a' + b$

13. Which one of the following boolean expressions is not logically equivalent to all of the rest?

- (a) $wxy' + wz' + wxyz + wy'z$
- (b) $wx + wy' + wyz'$
- (c) $w + x + y' + z'$
- (d) $wx + wy' + wz'$

14. Which one of the following boolean expressions is not logically equivalent of all of the rest?

- (a) $ab + (cd') + cd + bd$
- (b) $a(b+c) + c' \oplus d'$
- (c) $ab + ac + (c \oplus d')'$
- (d) $bd' + c'd' + ab + cd$

15. A half-adder is also known as

- (a) AND circuit
- (b) NAND circuit
- (c) NOR circuit
- (d) EX-OR circuit