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M. C. A. ENTRANCE

TEST PAPER: BOOLEAN ALGEBRA TEST-I

Total Questions: 15 Max. Time: 20 Min.

- 1. An AND gate can be imagined as
- (a) switches connected in series
- (b) switches connected in parallel
- (c) MOS transistors connected in series
- (d) none of the above
- **2.** Which of the following statement is correct?
- (a) The output of a NOR gate is high if all of its input are high.
- (b) The output of a NOR gate is low if all of its inputs are low
- (c) The output of a NOR gate is high if all of its inputs are low.
- (d) The output of a NOR gate is high if only one of its inputs is low.
- **3.** Which of the following is functionally complete set?
- (a) AND, OR
- (b) AND, XOR
- (c) NOT, OR
- (d) AND, OR, NOT
- **4.** Which of the following boolean algebra expression is incorrect?
- (a) A + A = A + B
- (b) A + AB = B
- (c) (A+B) (A+C) = A + BC
- (d) $(A + \overline{B})(A + B) = A$
- **5.** Which of the following boolean algebra expression is incorrect?
- (a) ABC + BC + AC = C
- (b) $(A+B)[\overline{A}(\overline{B}+\overline{C})]+\overline{B}\overline{C}+\overline{A}\overline{C}=1$
- (c) $AB + \overline{A}C + BC = AB + AC$
- (d) $AB + A = \overline{C} = B$

- **6.** Which of the following boolean algebra expression is incorrect?
- (a) AB + A (B+C) + B (B+C) = B+AC
- (b) $[A\overline{B} + (C + B\overline{D}) + \overline{A}\overline{B}]C = B\overline{C}$
- (c) $A\overline{B}(C+\overline{D}) = \overline{A} + B + \overline{C}D$
- (d)(A+C)(ABC+ACD) = ABC+ACD
- 7. Which of the following boolean algebra expression is incorrect?
- (a) $AB + A \overline{B} C + A = A + BC$
- (b) $\overline{A}B + \overline{A}B\overline{C} + \overline{A}BCD + \overline{A}B\overline{C}\overline{D}E = \overline{A}B$
- (c) $AB + (\overrightarrow{A} + \overline{B})C + AB = AB + A\overline{C} + B\overline{C}$
- (d) $(A + \overline{A})(AB + AB\overline{C}) = AB$
- **8.** The boolean expression

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

- (a) $AB + \overline{A}C$
- (b) $\overline{A}B + BC$
- (c) AB +BC
- (d) $A\overline{B}$
- **9.** Consider the following sequence of instructions:

a=a ⊕ b

b=a ⊕ b

a=b ⊕ a

This sequence

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

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- (a) 4^2
- (b) 2^4
- (c) 2^{16}
- (d) 4^{16}
- 11. Consider the boolean expression

$$\overline{x} y \overline{z} + \overline{x} \overline{y} z + x(y+z)$$
. The equivalent product

of sums form is

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