

- 1 Give the decimal value of binary 10010.
- (A) 18
 - (B) 20
 - (C) 6
 - (D) 9
- 2 The output of an AND gate with three inputs, A, B, and C, is HIGH when _____.
- (A) $A = 1, B = 1, C = 1$
 - (B) $A = 1, B = 0, C = 1$
 - (C) $A = 1, B = 1, C = 0$
 - (D) $A = 0, B = 0, C = 0$
- 3 If a 3-input NOR gate has eight input possibilities, how many of those possibilities will result in a HIGH output ?
- (A) 7
 - (B) 8
 - (C) 1
 - (D) 2
- 4 The output of a NOR gate is HIGH if _____.
- (A) any input is LOW
 - (B) all inputs are LOW
 - (C) all inputs are HIGH
 - (D) any input is HIGH

- 5 The Boolean expression for a 3-input AND gate is _____.
- (A) $X=A+B+C$
 - (B) $X=AB+C$
 - (C) $X=AB$
 - (D) $X = ABC$
- 6 What does the small bubble on the output of the NAND gate logic symbol mean ?
- (A) The output is inverted.
 - (B) None of these
 - (C) open collector output
 - (D) tristate
- 7 Logically, the output of a NOR gate would have the same Boolean expression as a(n) :
- (A) AND gate immediately followed by an inverter
 - (B) NOR gate immediately followed by an inverter
 - (C) NAND gate immediately followed by an inverter
 - (D) OR gate immediately followed by an inverter
- 8 The basic logic gate whose output is the complement of the input is the:
- (A) inverter
 - (B) comparator
 - (C) OR gate
 - (D) AND gate

- 9 Which of the following equations would accurately describe a four-input OR gate when $A = 1$, $B = 1$, $C=0$, and $D=0$?
- (A) $1 + 1 + 0 + 0 = 0$
 - (B) $1 + 1 + 0 + 0 = 00$
 - (C) $1 + 1 + 0 + 0 = 01$
 - (D) $1 + 1 + 0 + 0 = 1$
- 10 What are the symbols used to represent digits in the binary number system ?
- (A) 0 through 8
 - (B) 1,2
 - (C) 0,1
 - (D) 0,1,2
- 11 A full subtracter circuit requires _____.
- (A) three inputs and one output
 - (B) three inputs and two outputs
 - (C) two inputs and two outputs
 - (D) two inputs and three outputs
- 12 The output of an AND gate is LOW _____.
- (A) when any input is HIGH
 - (B) when all inputs are HIGH
 - (C) all the time
 - (D) when any input is LOW

- 13 Which of the following is an invalid BCD code ?
- (A) 0101
 - (B) 1001
 - (C) 0011
 - (D) 1101
- 14 The binary number 11001110 is equal to the decimal number_____.
- (A) 127
 - (B) 66
 - (C) 12
 - (D) 206
- 15 Which of the following is not a basic Boolean operation ?
- (A) AND
 - (B) FOR
 - (C) OR
 - (D) NOT
- 16 When does the output of a NAND gate = 1 ?
- (A) Whenever a 1 is present at an input
 - (B) Only when all inputs = 1
 - (C) Whenever a 0 is present at an input
 - (D) Only when all inputs = 0
- 17 Convert binary number 01011 to decimal.
- (A) 15
 - (B) 10
 - (C) 11
 - (D) 35

- 18** Convert decimal 64 to binary.
- (A) 00110110
 - (B) 01001000
 - (C) 01010010
 - (D) 01000000
- 19** The BCD number for decimal 347 is _____.
- (A) 0011 0100 0001
 - (B) 1100 1011 0110
 - (C) 1100 1011 1000
 - (D) 0011 0100 0111
- 20** The sum of 11101 + 10111 equals _____.
- (A) 110100
 - (B) 100100
 - (C) 110011
 - (D) 100001
- 21** A decimal 11 in BCD is _____.
- (A) 00010001
 - (B) 00010010
 - (C) 00001011
 - (D) 00001100
- 22** The difference of 111 – 001 equals _____.
- (A) 001
 - (B) 110
 - (C) 100
 - (D) 111

23 Which of the examples below expresses the distributive law of Boolean algebra ?

(A) $A + (B + C) = AB + AC$

(B) $A(BC) = (AB) + C$

(C) $(A + B) + C = A + (B + C)$

(D) $A(B + C) = AB + AC$

24 Which of the following combinations cannot be combined into K-map groups ?

(A) diagonal

(B) overlapping combinations

(C) corners in the same row

(D) corners in the same column

25 The base of the hexadecimal system is _____.

(A) ten

(B) two

(C) eight

(D) sixteen

26 Which of the following expressions is in the sum-of-products (SOP) form ?

(A) $AB(CD)$

(B) $AB + CD$

(C) $(A + B)(C + D)$

(D) $(A)B(CD)$

27 How many gates would be required to implement the following Boolean expression before simplification ?

$$XY + X(X + Z) + Y(X + Z)$$

(A) 4

(B) 5

(C) 1

(D) 2

28 The NAND or NOR gates are referred to as "universal" gates because either :

(A) are used in all countries of the world

(B) were the first gates to be integrated

(C) can be found in almost all digital circuits

(D) can be used to build all the other types of gates