Test in Class -----Chapter1-4

1. Add the two BCD numbers: 1000 0011 and 0010 0101. (0001 0000 1000)

2. Convert the Gray code 1011 0101 to binary. (1101 1001)

3. An odd parity system receives the following code groups: 1001 0100, 1000 1000, and 1101 0001. Determine which groups, if any, are in error. (10001000,11010001)

4. A basic 2-input logic circuit has a HIGH on one input and a LOW on the other input, and the output is HIGH. What type of logic circuit is it?
(An OR gate or an exclusive-OR gate)

5. Write the output expression for the circuit in Figure 1 in SOP form.($A\bar{B}\bar{C}\bar{E} + A\bar{B}\bar{D}\bar{E}$)

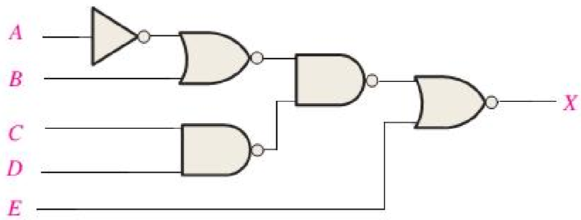

Figure 1

6. Write the output expression for a circuit with input waveform and output waveform, as shown in Figure 2. ($AB + \bar{A}\bar{B}$)

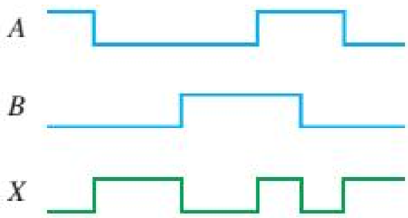

Figure 2

7. Figure 3 shows a (D) diagram.
（A）circuit (B) logic (C) state (D) timing

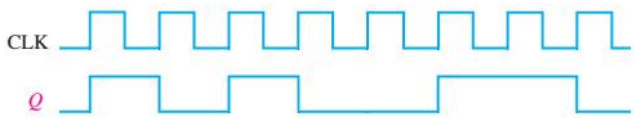

Figure 3

8. The signed number - 101_2 is expressed as a 4-bit number 1011_2 in the (C) form.
(A) sign-magnitude (B) 1's complement (C) 2's complement (D) offset binary

9. The 2's complement number system can represent integers in the range (B), where n is the number of bits available for the representation.

(A) $0\le N\le 2^n-1$ (B) $-2^{n-1}\le N\le 2^{n-1}-1$ (C) $-2^n\le N\le 2^n-1$ (D) None of the above

10. A periodic waveform has frequency of 100Hz and a pulse width of 0.05ms. The duty cycle is (A)
(A) 0.5% (B) 5% (C) 50% (D) 0.0055%

11. How many of the following statements are false? (C)
(A) 1 (B) 2 (C) 3 (D) 4
(1)When a Boolean variable is multiplied by its complement, the result is the variable.
(2)"The complement of a product of variables is equal to the sum of the complements of each variable" is a statement of DeMorgan's theorem.
(3)SOP means series of products .
(4)Karnaugh maps can be used to simplify Boolean expressions.
(5)A 4-variable Karnaugh map has eight cells.

12. From Figure 4, we can obtain Y=(B)
(A)$\overline{AB}$ (B) $AB+\overline{C}$ (C) $(\overline{A}+\overline{B})C$ (D) None of the above

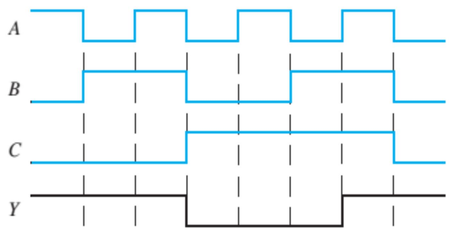

Figure 4

13. The AND operation can be produced with (C) NOR gates.
(A)1 (B)2 (C) 3 (D) None of the above

14. $X = AC + \overline{A}\,\overline{B} + \overline{A}\,\overline{C} \neq$ (D)
(A) $\overline{A}\,\overline{B}\,\overline{C} + \overline{A}BC + \overline{A}B\overline{C} + A\overline{B}C + ABC$
(B) $(A+\overline{B}+\overline{C})(\overline{A}+C)$
(C) $\overline{A}\,\overline{C} + \overline{B}C + AC$
(D) None of the above

15. From the K-map in Figure 5, we obtain the minimum SOP expression: (A)

(A) $Y = AD + B + \overline{C}\,\overline{D}$

(B) $Y = AB + AD + \overline{B}\,\overline{C}\,\overline{D}$

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

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

Y

AB \ CD	00	01	11	10
00	1	0	X	X
01	X	X	X	X
11	1	1	1	1
10	1	1	1	0

Figure 5

16. The outputs L_1, L_2, and L_3 of the 1-bit comparator in Figure 6 indicate (A) respectively.

(A) $A < B$, $A = B$, and $A > B$
(B) $A > B$, $A = B$, and $A < B$
(C) $A < B$, $A \neq B$, and $A > B$
(D) $A > B$, $A \neq B$, and $A < B$

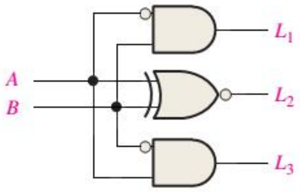

Figure 6

17. The function performed by the circuit in Figure 7 is (A)

(A) $Y = \overline{A}\,\overline{B}\,\overline{C} + \overline{A}BC$ (B) $Y = \overline{A}\,\overline{B}C + A\overline{B}\,\overline{C}$ (C) $Y = \overline{A}B\overline{C} + A\overline{B}C$ (D) $Y = \overline{A}BC + AB\overline{C}$

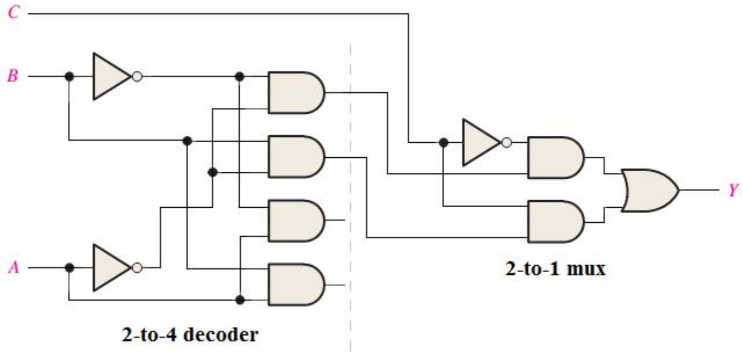

Figure 7

18. Simplify the logic expression.

$$X = \overline{(\overline{AB})(\overline{B+D})(\overline{\overline{C}D})} + BC + \overline{A}(\overline{\overline{B\overline{D}} + A}) + \overline{\overline{C}D} \quad = 1$$

19. Using a Karnaugh map to simplify the following function.

$F = A\,\overline{B}\,\overline{C} + \overline{A}\,\overline{B} + \overline{A}D + BD + C = \overline{B} + C + D$