中 山 大 学 软 件 学 院 **2008** 级 软 件 工 程 专 业 (2009 秋季学期)

《 Digital Circuits and Logic Design》 期 末 试 题 答 案 (A)

Answers to the Examination of 'Digital Circuits and Logic Design' (A)

Part I

1. Answer:
$(8C)_{16}=(10001100)_2$
$(10011101)_2=(9D)_{16}$
$(127)_{10}=(01111111)_2$
2. Answer: 1
3. Answer: 8 x 10 x 12 =960
4. Answer: (1/0.25)*3=12 us
5. Answer: Y=0

Part II

1. **Answer: (b)**
2. **Answer: (d)**
3. **Answer: (d)**
4. **Answer: (c)**
5. **Answer: (a)**

Part III

1. Answer

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

(2) $Y = A + CD$

2. Answer

(a)

$S = A \oplus B \oplus CI$

$CO = AB + CI\square(A \oplus B)$

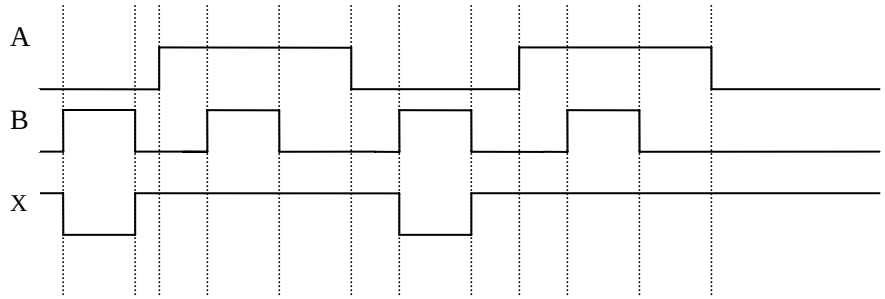
(b)

A	B	CI	S	CO
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

(c)

It works as a full adder.

3. $X = \overline{\overline{A}B\overline{B}} = \overline{\overline{A}B} = A + \overline{B}$



4. Answer

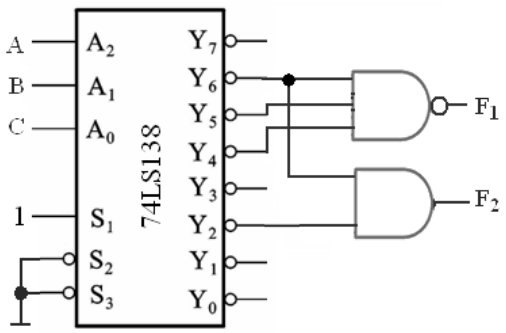
$F_1 = \sum m(4,5,6)$

$= Y_4 + Y_5 + Y_6 = \overline{\overline{Y_4}\,\overline{Y_5}\,\overline{Y_6}}$

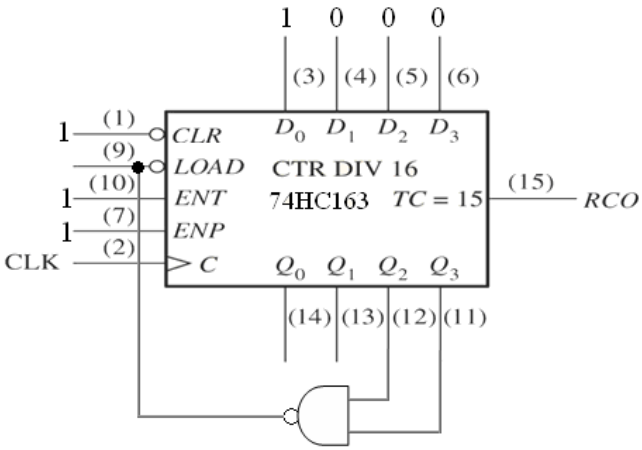
$\because F_2 = \sum m(0,1,3,4,5,7)$

$\therefore F_2 = \overline{\sum m(2,6)}$

$= \overline{\overline{Y_2} + \overline{Y_6}} = \overline{Y_2}\,\overline{Y_6}$



5. Answer

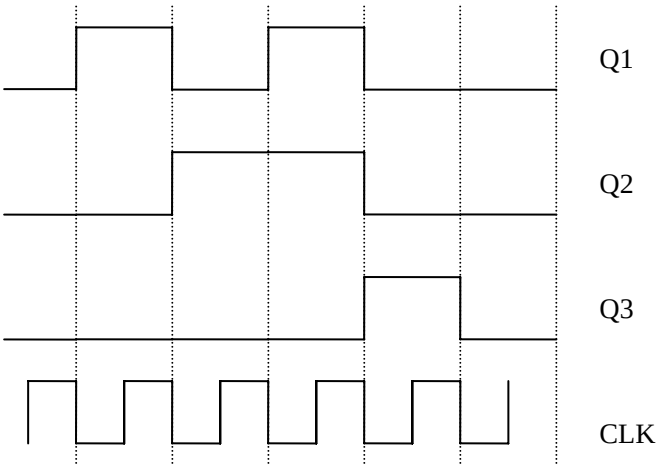


6. Answer

$J_1 = K_1 = \overline{Q_3^n}, Q_1^{n+1} = \overline{Q_3^n}\,\overline{Q_1^n} + Q_3^n Q_1^n$

$J_2 = K_2 = Q_1^n, Q_2^{n+1} = Q_1^n \overline{Q_2^n} + \overline{Q_1^n} Q_2^n$

$J_3 = Q_1^n Q_2^n, K_3 = Q_3^n, Q_3^{n+1} = Q_1^n Q_2^n \overline{Q_3^n}$



7. Answer

Q3 \ Q2 Q1	00	01	11	10
0	**001**	**010**	**100**	**011**
1	**101**	**110**	**XXX**	**000**

$J_3 = Q_2 Q_1 \qquad K_3 = \overline{\overline{Q}_2 + Q_1} = Q_2 \overline{Q}_1$

$J_2 = Q_1 \qquad K_2 = \overline{\overline{Q}_3 \overline{Q}_1}$

$J_1 = \overline{Q_2 Q_3} \qquad K_1 = 1$