國立雲林科技大學
97 學年度產業研發碩士專班秋季班招生考試

系所：電子工程系
科目：計算機概論

1. (A) Please draw a 4-bit synchronous binary counter by JK flip-flops. (5%)
   (B) Please draw a 4-bit binary up-down counter using T flip-flops. The Function Table as Table I (15%)

Up	Down	Function
0	0	No Change
0	1	Down Count
1	0	Up Count
1	1	Up Count

Table I : Function Table

2. Please convert the decimal number $(153.513)_{10}$ to Octal $(???)_8$ (10%)

3. Please list the correct SDRAM general sequence of applying commands from the below commands (10%)

   - Bank activate
   - Set up mode register
   - Precharge all
   - Bank precharge
   - Auto precharge or not
   - Read/write
   - Power on
   - Auto refresh or self refresh

4. Please define the following items. (10%)
   (i) Horizontal sync (in VGA)
   (ii) Vertical sync (in VGA)
   (iii) Back porch
   (iv) Frame

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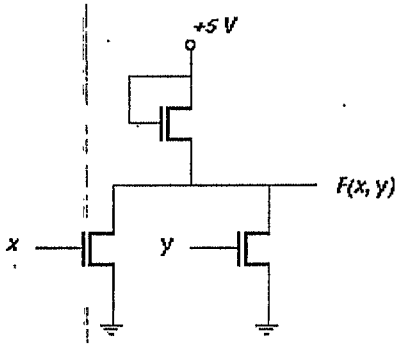
5. (10%) Identify the NMOS gate circuit shown

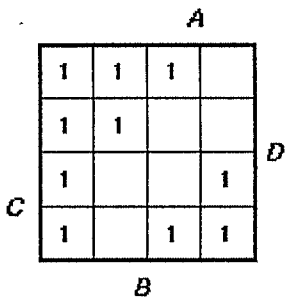


(a) AND gate
(b) OR gate
(c) NOT gate
(d) NAND gate
(e) NOR gate

6. (10%) Given that F = SUM m(0,1,4,5,6), which of the following correctly describes F'?

(a) F' = SUM m(1,4,6,7)
(b) F' = PRD M(2,3,7)
(c) F' = PRD M(0,1,4,5,7)
(d) F' = SUM m(0,1,4,5,6)
(e) F' = SUM m(2,3,7)

7. (10%) Identify the most simple SOP expression which generates the Karnaugh map shown:



(a) A'B' + A'C' + B'C + ABD'
(b) A'C' + B'C + ABD'
(c) A'B' + C'D' + ACD'
(d) A'B' + A'C' + AC
(e) A'B'A'C' + B'C + BC'D'

8. (10%) Which of the following state tables correctly describes the state diagram shown?

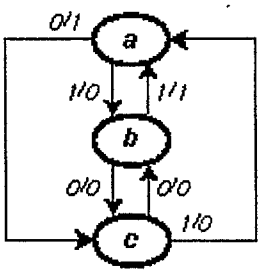


Table 1

PS	X	NS	Z
a	0	b	0
a	1	c	1
b	0	c	0
b	1	a	1
c	0	a	0
c	1	b	0

Table 2

PS	X	NS	Z
a	0	c	1
a	1	b	0
b	0	c	0
b	1	a	1
c	0	b	0
c	1	a	0

Table 3

PS	X	NS	Z
a	0	c	0
a	1	a	0
b	0	a	1
b	1	b	0
c	0	b	0
c	1	c	1

Table 4

PS	X	NS	Z
a	0	a	0
a	1	b	0
b	0	c	0
b	1	b	1
c	0	b	0
c	1	a	0

Table 5

PS	X	NS	Z
a	0	c	1
a	1	b	0
b	0	a	1
b	1	b	0
c	0	a	0
c	1	c	1

(a) Table 1 (b) Table 2 (c) Table 3 (d) Table 4 (e) Table 5

9. (10%) A ROM having a total capacity of 64K bits (K = 1024 = 2^10) is given. If the ROM is known to have 8 outputs, how many address lines are there?

(a) 11 (b) 12 (c) 13 (d) 14 (e) 15