

(1) $T = 5 \text{ ms} = 5 \times 10^{-3} \text{ s}$

各 4 分 $f = \frac{1}{T} = \frac{1}{5 \times 10^{-3}} = \frac{1000}{5} = 200 \text{ Herz}$ or 200 Hz 次/s

duty cycle = $\frac{1}{5} \times 100\% = 20\%$

- (2) (a) 1110000
(b) 1000011

(3) $5.37 \times 10^3 = (5370)_{10} = (101001111010)_2$
 $= 1.01001111010 \times 2^{12}$

$12 + 127 = (139)_{10} = (10001011)_2$

01000101101001111101000000000000 ← Ans

(4) $3.248 \times 10^4 = 32480 = 1.11110111 \times 2^{14}$

↑
4分

(5) 11000010001
↓↓↓↓↓↓↓↓↓↓↓↓
10000011110 ← Ans

(6) $(870)_{10}$

(7) 1000 1010 1001 1101

(8) (a) 00111001

(b) 11011100

(9) 100111001010

↑ 前方可以再加1.

(10) $(00011)_2$ or 3

(11) 00011111

(12) 01111110

(13)

	YZ			
WX	00	01	11	10
00	0	1	1	1
01	1	0	1	1
11	1	0	0	0
10	1	1	0	1

$$\bar{x}\bar{z} + \bar{w}y + \bar{y}\bar{z} + \bar{x}\bar{y}$$

↑
答對再得3分
(全對才給分)

↑ K-map 畫對得2分

(14)

$$AC$$

(15)

	DE			
BC	00	01	11	10
00	1		1	
01			1	
11		1		1
10				1

A=0

	DE			
BC	00	01	11	10
00			1	
01				
11				
10	1		1	1

A=1

$$\bar{A}\bar{B}\bar{C}\bar{D}\bar{E} + \bar{A}\bar{B}D\bar{E} + \bar{A}BC\bar{D}\bar{E} + \bar{A}B\bar{D}\bar{E} + ABC\bar{E} + AC\bar{D}E$$

少一個 term 扣1分
多一個 term 扣1分

(16)

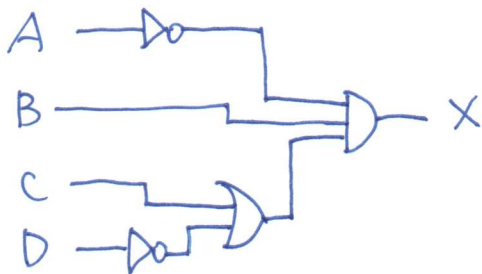
	CD			
AB	00	01	11	10
00	1	0	X	X
01	1	0	0	1
11	0	X	0	X
10	X	0	1	1

$$\bar{A}\bar{D} + \bar{B}C$$

↑ 2分 ↑ 2分

多一個 term 扣1分
少一個 term 扣2分

(17)



(18) $X = 1$

$$\begin{aligned} X &= \overline{A \cdot B} + (B + C) \\ &= \overline{A} + \overline{B} + B + C \\ &= \overline{A} + 1 + C = 1 \end{aligned}$$

(19) $\overline{A} + B + \overline{C} \cdot D \cdot E = (\overline{A} + B + \overline{C}) \cdot (\overline{A} + B + D) \cdot (\overline{A} + B + E)$

(20) (b)

(21) 45

(22) $(EB5)_{16}$

(23) 0.1110100.....

↑ 算到小數點後第六位即可

(24)

Sign-Magnitude form: 10100011 → 2分
1's complement form: 11011100 → 2分

(25)

A	B	C	X
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1