國立雲林科技大學 **114** 學年度
碩士班招生考試試題

系所：電子系
科目：計算機概論**(3)**

本試題共 8 題，每題得分如各題中所示，共計 100 分，請依題號作答並將答案寫在答案卷上，違者不予計分。

1. (10 pt.) Add the following bit patterns. Leave your results in binary form.
(a) (2 pt.) 1011 + 0001
(b) (2 pt.) 0000 + 1010
(c) (2 pt.) 1100 + 0011
(d) (2 pt.) 0101 + 0110
(e) (2 pt.) 1111 + 0001

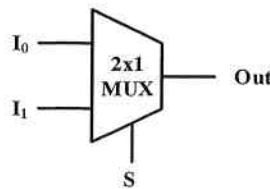2. (10 pt.) Convert the following unsigned binary numbers to hexadecimal.
(a) (2.5 pt.) 1101 0001 1010 1111
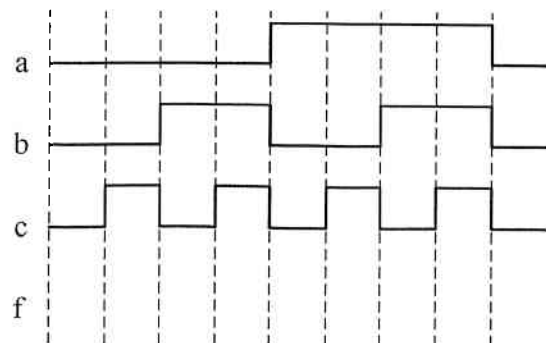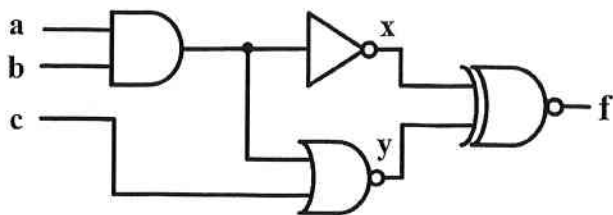(b) (2.5 pt.) 001 1111
(c) (2.5 pt.) 1
(d) (2.5 pt.) 1110 1101 1011 0010

3. (10 pt.) A symbol of 2-to-1 mux is listed below. Please draw the gate-level circuit of 2-to-1 mux.

4. (20 pt.) Complete the timing diagram of the following circuit:
Please draw the waveform of the output f.

5. (10 pt.) Assume that the scheduling of a processor is shown in the following table. There are three procedures to be done. Priority Scheduling (PS) scheme for procedure arrangements has been adopted. The priority of procedure P2 is the highest, followed by procedure P3. The lowest priority is the procedure P2. The execution time of the procedures 1-3 are 7, 5, and 4 milliseconds (ms), respectively. What is the average waiting time for a processor?

Procedures	Orders of Priority	Execution time(ms)
P1	3	7
P2	1	5
P3	2	4

6. (10 pt.) According to the IEEE 754 single-precision number representation, the binary value is $11000010001010101000000000000000_{(2)}$. What is the decimal value?

7. (20 pt.) Emile and William are important company developers. Every time they send a message, they use the Diffie-Hellman (DH) algorithm to generate a set of keys, which will be XOR-encrypted with the message before sending it to each other. Even if others see it, they cannot get the content of the message. According to the DH algorithm, Emile and William selected two public numbers g=5 and p=3, and each selected two numbers a=2 and b=3, which are known only to each other. After calculating the key, the ciphertext sent is $0x00_{(16)}$, $0x00_{(16)}$, $0x03_{(16)}$, $06_{(16)}$. What should the plantext (decoded text) be?

8. (10 pt.) Computers and microprocessors usually contain
   1. DDR5 main memory,
   2. Register register,
   3. Cache
   4. SSD high-speed hard disk,
Please arrange from fastest to slowest.