

臺灣期貨交易所 99 年新進人員招募試題

甄選類別【代碼】：網路管理人員【79401】

專業科目：電腦概論、網路基礎架構

*請填寫入場通知書編號：_____

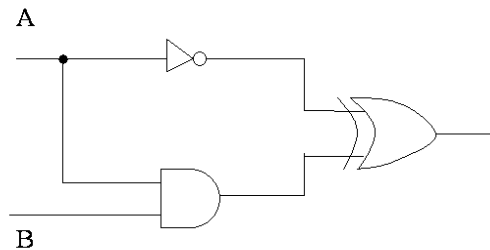
注意：①本試卷為一張單面，共有 6 大題之非選擇題，其中 4 題配分各為 15 分，2 題配分各為 20 分。
 ②限用藍、黑色鋼筆或原子筆於答案卷上採英文橫式作答（以中文作答者，該題不予計分），並請從答案卷內第一頁開始書寫，違反者該科酌予扣分。所有題目不必抄題但須標示題號。
 ③應考人得使用簡易型計算機；於測驗時將不符規定之電子計算機放置於桌面或使用，若經勸阻無效，仍執意使用，該科扣 10 分；計算機並由監試人員保管至該節測驗結束後歸還。
 ④答案卷務必繳回，未繳回者該科以零分計算。

題目一：

- a. What is the hexadecimal representation for the decimal number 1000? 【4 分】
- b. What is the two's complement representation of the decimal value - 25 if the number of digits is 6? 【4 分】
- c. Suppose we use 8 bits with the following format to represent floating numbers: the highest bit is the sign bit, the next 4 bits are for mantissa, and the last 3 bits are for exponent; The exponent is represented by the excess-4 code. Then, what is the decimal value for the following floating number representation: 11101101 【7 分】

題目二：

- a. What is the Boolean expression for the following circuit: 【3 分】



- b. Show the behavior of the circuit in question 1 with a truth table. 【3 分】
- c. Given the following Boolean expression properties:

Property	AND	OR
Associative	$(AB)C=A(BC)$	$(A+B)+C=A+(B+C)$
Commutative	$AB=BA$	$A+B=B+A$
Identity	$A1=A$	$A+0=A$
Complement	$A(A')=0$	$A+(A')=1$
Distributive	$A(B+C)=(AB)+(AC)$	$A+(BC)=(A+B)(A+C)$

Show each step, accompanied with the property used, in deriving the following circuit equivalence: $AB' +BA = A$ 【5 分】

- d. Show the DeMorgan's Law of Boolean algebra. 【4 分】

题目三：

Given the following specification of a disk drive:

Parameter	value
Seek time (average)	77 msec
Rotation speed	7200 rpm
Read time per sector	1.2 msec
Number of Cylinders	40
Tracks per cylinder	2
Sectors per track	10
Bytes per sector	1024

- What is its average rotation time in terms of msec (milliseconds)? 【5分】
- How many bytes are contained in a track? 【5分】
- Given the answer in question 1, how many msec (milliseconds) does it take to rotate and read all sectors in a track? 【5分】
- Given the above answers, what is the minimum transmission bandwidth (bps) from the disk to CPU to ensure that the buffered data would be transmitted completely? 【5分】

题目四：

The international standard organization (ISO) defines the 7 layers architecture for the open system interconnection (OSI). Please answer the following questions:

- Explain why flow control is needed in networks. 【5分】
- What layers perform flow control? 【5分】
- What are the differences in the layers that perform flow control? 【5分】

题目五：

Generally, a host requires three elements to connect the Internet: an IP, a subnet mask, and the address of a nearby router. Please answer the following questions:

- What is the dynamic host configuration protocol (DHCP)? 【5分】
- What is the network address translation (NAT)? 【5分】
- What are the differences between DHCP and NAT? 【5分】

题目六：

Construct a minimum cost spanning tree for the undirected connected graph with the cost beside each link shown below by

- Kruskal's** algorithm without any constrain. 【10分】
- Prim's** algorithm without any constrain. 【10分】

(Note: Please mark the sequence number beside each link)

