

靜宜大學 107 學年度碩士班招生考試試題

學系：資訊學院

科目：計算機概論

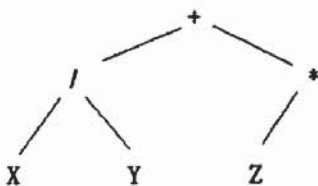
一、單選題：選出一個最恰當的答案，答錯不倒扣 (15*2%)

- Given the mask = $(7777)_8$ and 12-bit bit pattern A, if $\sim A = A \star \text{mask}$, which of the following logic operators is \star ?
[A] XOR [B] AND [C] OR [D] NOT
- Which of the following I/O methods can transfer a large block of data between an I/O device and the main memory directly?
[A] Isolated [B] DMA [C] Interrupt-driven [D] Programmed
- Which of the following 10-bit sign-magnitude integers operations will never be overflow?
[A] positive integer - negative integer [B] negative integer - negative integer
[C] negative integer - positive integer [D] positive integer + positive integer
- How many bits are used to represent characters by ASCII code?
[A] 32 [B] 16 [C] 8 [D] 7
- How many bits at least are required to store the decimal integer K? ($0 \leq K < 600$)
[A] 7 [B] 8 [C] 9 [D] 10
- Which of the following representations is erroneous?
[A] 255 [B] $(287)_8$ [C] $(10110)_2$ [D] $(AFF)_{16}$
- Which of the following number representation is used to present a real in IEEE standard for single or double precision?
[A] unsigned [B] 1's complement [C] sign-and-magnitude [D] 2's complement
- What is the maximum number of integers represented in 8 bits?
[A] 255 [B] 512 [C] 8 [D] 256
- 每一個 web 網頁都有一個獨一無二的位址稱為
[A] SMTP [B] URL [C] IP [D] POP
- 封包的路由發生在哪一層?
[A] network [B] data link [C] application [D] physical
- _____ 作業系統可以保證在限定的時間內完成指定的工作。
[A] real-time [B] time-sharing [C] multiprogramming [D] distributed
- 根據下列的演算法，F(6)的傳回值為何?
Algorithm F(n) {
 return (F(n - 1) + F(n - 2));
 if (n = 0) return 0;
 if (n = 1) return 1;
}
[A] 5 [B] 8 [C] 13 [D] 以上皆非
- Once locating the node to be deleted, we simply change its predecessor's link field to point to the deleted node's _____.
[A] Next [B] Successor [C] Predecessor [D] Head pointer

14. Suppose we have the following variable declarations, which statement as follows is correct?
 real *i, j, *k;
 int x, y, *z;
 [A] i, j, k are real data [B] i, k, y are pointers [C] k and z are pointers [D] *x, *z are integers
15. Given a linked list with 15 nodes initially, how many nodes in the linked list after the following five operations are executed: (a) Adding a node into the middle of the list (b) Deleting a node from the end of the list (c) Traversing the whole list (d) Adding a node into the beginning of the list (e) Retrieving a node from the list
 [A] 12 [B] 14 [C] 16 [D] 18

二、填充題：(15*2%)

- A computer has 128GB (gigabytes) of memory. Each word in this computer is 4 bytes. Then ① bits are needed to address any single word in memory.
- A technique called ② is to improve the throughput of CPU by performing instruction phases simultaneously.
- If the ASCII code of "m" is $(6D)_{16}$, what's the ASCII code of "p"? ③ (Show the answer in hexadecimal.)
- If you want to unset the three rightmost bits of an 8-bit pattern, you can use a(n) ④ operation with the mask ⑤. (in hexadecimal)
- At the beginning of the computer age, the only one computer language is ⑥ language.
- The hexadecimal number equivalent to $(10101.11)_2$ is (⑦)₁₆.
- IPv6 位址的長度為 ⑧ bit。
- What is the final value of x in the following segment of an algorithm? ⑨
 stack (S)
 push (S, 10)
 push (S, 2)
 pop (S, x)
 push (S, 3)
 pop (S, x)
 pop (S, x)
- TCP/IP model 中 ⑩ 層負責 process-to-process 之間的資料傳送?
- 已知下列的 expression tree，其 pre-order traversal 的順序為 ⑪，in-order traversal 的順序是 ⑫。



11. 試列出任意三種 sorting algorithm 的名稱: ⑬、⑭、⑮

三、問答題 (40%)

1. (8分) 試列出 von Neumann model 所包含的四個子系統(subsystem)。
2. (6分) How many bytes are needed to represent a non-compressed true-color image that has 256×256 pixels? (以KB或MB為單位)
3. (6分) If $X = (\text{FF}2)_{16}$ is a 12-bit 2's complement integer, what is the result of arithmetic left shift 3 bits on X? (Show the answer in decimal.)
4. (6分) 試列出任意四種網路拓模。
5. (6分) 針對作業系統的範疇，試舉例說明何謂starvation。
6. (8分) 試舉出一個 linked list 的例子，然後展示插入一個新節點的步驟。用圖表示即可，不必撰寫演算法。