

國立嘉義大學九十七學年度 資訊管理學系碩士班招生考試試題

科目：計算機概論

1. Please briefly describe the main function of CGI? (5 points)
2. Please briefly describe the properties of Bluetooth technique. (5 points)
3. Excluding the Bluetooth earphone, please imagine and briefly describe **ONE** possible application of Bluetooth in the real life. (7 points).
4. Regardless of what generation of programming language is adopted, all high-level language programs must be translated into executable code before being executed. Compilation and interpretation are two different kinds of methods used to develop executable code. Please briefly describe the process of developing executable code using the compilation method. (5 points)
5. What are the advantages of the interpretation as compared with the compilation? (5 points)
6. How many bytes will it take to store a 3×4 inches, resolution 300 ppi, full-color (24 bits/pixel) digital image (1KB = 1000 Bytes, 1MB = 1000KB)? (5 points)
7. What does the slogan 「30 萬畫素照相手機」 mean? (5 points)
8. What does 「64 位元個人電腦」 mean? (5 points)
9. What is the size of the addressable memory in the computer that uses 36-bit address bus? (5 points)
10. What is the two's complement of $(01010100)_2$. (3 points)
11. (1) What is the advantage of the variation of linked allocation that uses a FAT to chain together the blocks of a file? (5 points)
(2) The FAT scheme, however, may result a significant number of disk head seeks between FAT and data blocks. Please briefly explain the reason and give a suggestion to avoid this problem. (5 points)
12. Three programs containing semaphore-operations are shown as the following:

<pre>P1() { while(TRUE) { wait(sem1); /* critical section: CS1 */ signal(X); } }</pre>	<pre>P2() { while(TRUE) { wait(sem2); /* critical section: CS2 */ signal(Y); } }</pre>	<pre>P3() { while(TRUE) { wait(sem3); /* critical section: CS3 */ signal(Z); } }</pre>
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- (1) If the execution sequence of these three critical sections is CS3→CS1→CS2→CS3→CS1→CS2..., please give the correct semaphores of **X**, **Y**, and **Z** and the initial values for these binary semaphores. (5 points)
- (2) On a priority-based scheduling system, synchronization mechanisms (e.g., the semaphore) may cause the priority inversion problem. What's that? Briefly describe a possible solution. (5 points)

13. What is "Phishing"? How does it affect businesses while we lose control of the growth of Phishing? (5 points)
14. What is "Dynamic Linking"? And give two advantages while executing programs with dynamic linking. (5 points)
15. Please explain two differences between IPv4 and IPv6 in detail. (5 points)
16. As compared with the traditional telephone systems, discuss the obstacles to overcome while applying VoIP on the Internet. (5 points)
17. 以下哪些行為可能涉及不法？ (5 points)
 - (a) 轉貼網路上未經證實之文章。(例如：某某黑心飲料店添加致癌物...)
 - (b) 未經授權，直接使用室友電腦。
 - (c) 將自製的病毒程式公布於部落格上，供人免費下載。
 - (d) 未經作者同意，直接引用市場分析圖表於課堂報告的投影片。
 - (e) 在管理單位不知情下，利用系統漏洞成功進入主機，但未進行任何破壞或窺看資料等惡意行為。
18. 嘉大新民校區某類 Router 的 Routing Table 如下表：(5 points)

Row	Destination Network or Subnet	Mask	Metric (Cost)	Interface	Next-hop Router
1	140.131.0.0	255.255.0.0	50	2	G
2	140.130.0.0	255.255.0.0	25	2	G
3	140.130.203.0	255.255.255.0	5	1	Local
4	140.130.203.0	255.255.255.0	15	2	K
5	140.130.204.0	255.255.252.0	20	2	K
6	140.130.204.0	255.255.255.0	10	1	K
7	0.0.0.0	0.0.0.0	25	3	H

- (1) 請問 Row 5 所指定的子網域內，理論上共有多少個 IP 可供使用？
- (2) 請問 Destination Address 是 140.130.203.118 的封包可以符合哪幾條 Row？
- (3) 承上題 (2)，哪一條是 Best Match？為什麼？
- (4) Row 7 的目的是什麼 (請寫出專有名稱及其作用)？
- (5) 請問 Router 平均每秒要完成多少次的 Row Matching，才能達到 100Mbps 的 Throughput？(假設每個封包大小是 100 Bytes)