





九十三學年度 科 電 系(所) 丁 組碩士班入學考試

科目 計算機概論 科號 6202 共 4 頁第 3 頁 \*請在試卷【答案卷】內作答

13. Consider the operation of a CPU. Suppose there are 5 stages for an instruction to be executed. Each stage takes 2 nanoseconds. With the existence of one 5-stage Pipeline, what is the actual rate of processing

- A. 5000 MIPS                      B. 1000 MIPS  
C. 500 MIPS                        D. 100 MIPS

14. Which statements are true?

- (A) In reading data from a hard disk, the rotational delay comes before seek time  
(B) RAID is a concept of using several small disk packs that work together as a unit  
(C) Batch processing is not suitable for a monthly payroll printout  
(D) Hashing is not suitable for locating records sequentially

15. Which statements are correct?

- (A) File Servers can be used to deliver an entire file to a user node.  
(B) A silicon chip is called an organic chip.  
(C) Two dissimilar networks need to be connected by a gateway.  
(D) Data and instructions are put into primary storage by the control unit.

二、計算簡答題：共 11 題，每題 5 分，共 55 分，可以中文或英文回答。  
注意：回答時，請精簡扼要。

- Given an IP address: 140.130.120.110 with subnet mask of 255.255.255.0,  
(a) what is the host ID:  
(b) what is the network ID
- What is Moore's Law (proposed by Gordon Moore)?
- What are the advantages you gain when perform Normalization procedures in order to conform to 1NF? to 2NF? And to 3NF?

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4. What is UDDI? What is SOAP?
5. The visual field of the human eye consists of about  $10^6$  pixels. Each pixel can be reduced to a superposition of the three primary colors, each of which has 64 intensities. The time resolution is 100 millisecc. Compute the data rate of the human eye.
6. How many bits does ASCII code use? 看中文網站時，例如中時電子報，經常把行政院長的名字游錫堃，寫成游錫(方方土)。請問是何原因。
7. In a local area network, each packet transmitted on network causes an interrupt on the bridge, which connects two LANs. Suppose it takes 250  $\mu$ sec per packet to handle the interrupt and inspect the packet. But when forwarding is needed, it is done by DMA hardware. If all packets are 1K bytes, what is the maximum data rate on each of the networks that can be tolerated without having the bridge lose packets?
8. To allocate free space on the hard disk for a file, the operating system must keep track of which blocks are available, and which are already in use storing other files. Please specify two possible approaches to maintain the free disk space. And explain the advantages / disadvantages of each approach.
9. A manufacturer advertises that its color bit-map terminal can display  $2^{24}$  different colors. Yet the hardware only has 1 byte for each pixel. How can this be done?
10. A computer uses DMA to read from disk. The disk has 64 512-byte sectors per track. The disk rotation time is 16 msec. The bus is 16 bits wide, and bus transfers take 500 nsec each. The average CPU instruction requires two bus cycles. How much is the CPU slowed down by DMA.
11. The mobile phone systems in Taiwan use GSM system. There is an alternative one called CDMA. Please explain what GSM system differs from CDMA system.