

A(Wed) B(Mon) ID: \_\_\_\_\_ Name: \_\_\_\_\_ Score: \_\_\_\_\_

**Grading: 5 points for Prob. 1 and 2 points each for other Probs.**

**1. Answer the following single/multiple choices and fill the table located on the middle side of this page. 請回答下列單選/複選之選擇題，且將答案寫在本頁中間表格中**

- (1) Which computer model is right the basis for today's computers? 何種計算機模型正是今日電腦的基礎 A. Turing 圖靈 B. Pascal 巴斯卡 C. von Neumann 范紐曼 D. Leibnitz 雷尼茲
- (2) Which one is to determine the execution ordering for next instruction in a CPU? CPU 內部何者決定要執行下一個指令 A. Instruction register 指令暫存器 B. Cache memory 快取記憶體 C. Data register 資料暫存器 D. Program counter 程式計數器
- (3) Which one type of memory is suitable for rewriting the program during the development? 何者記憶體最適合於在開發期間重複燒錄資料 A. ROM B. PROM C. EEPROM D. Flash RAM 快閃記憶體
- (4) Which bus controller has the Giga-bit serial transfer? 何種匯流排控制器具 Giga 位元串聯傳輸 A. USB 2.0 B. IEEE 1394 C. SCSI D. USB 3.0
- (5) What is the minimum decimal number for a 8-bit two's complement? 二的補數八位元之最小十進制值為 A. -128 B. -127 C. 127 D. 128
- (6) If the computer is powered down, which one type of memory that the internal data will be completely erased. 當電源關機時，何者內部資料將被完全清除 A. ROM B. SSD 電子硬碟 C. cache SRAM 快取記憶體 D. Main memory DRAM 主記憶體
- (7) A machine cycle has three specific ordering steps in running program on a computer. 機械週期有哪三個指定次序步驟 A. fetch 提取, execute 執行, and decode 解碼 B. decode, fetch, and execute C. decode, execute, and fetch D. fetch, decode, and execute
- (8) Storing an audio signal on a computer, there is a series of ordering steps. 儲存音頻有哪三個指定次序步驟 A. quantization 量化, sampling 取樣, and encoding 編碼 B. sampling, quantization, and encoding C. sampling, encoding, and quantization D. none of above 以上皆非
- (9) Which layer is for supporting various services in TCP/IP? TCP/IP 哪一層提供使用者各種服務 A. Transport layer 傳輸層 B. Application layer 應用層 C. Data-link layer 資料連結層 D. Network layer 網路層
- (10) Which image looks like ragged after it was enlarged. 何者影像放大後看起來像鋸齒模糊圖 A. Vector graphics 向量圖 B. GIF photo C. JPEG photo D. Bit-mapped photo

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

2. (a) What is required memory space for eight characters in Chinese? 八個中文字需多少記憶體 (b) What is **Unicode**? 何謂萬國碼
3. (a) Explain **Moore's law**. 說明莫爾定律 (b) Explain the mean of ADSL **20M/12M**. 說明 ADSL 20M/12M 何意
4. (a) What is the **pipelining**? 何謂管線處理 (b) Explain the function of **Cache memory**. 說明快取記憶體的功能
5. (a) What is SSD 何謂固態硬碟 (b) Please list at least four kinds of modern OSs. 請列出至少四種現代的作業系統

6. Please show the block diagram of **Von Neumann computer model** and point out its major characteristics.  
請繪出范紐曼計算機模型的方塊圖及點出它的特色

7. Please **connect their corresponding function** for both sides. 請連結雙邊對映功能

Individual I/O instructions 具有獨立 I/O 指令
Block data access 區塊資料存取
I/O device requires CPU for service I/O 裝置要求 CPU 服務
Connecting all I/O devices 可連結所有 I/O 裝置
CPU polling I/O device for service CPU 點名 I/O 裝置是否服務
Same format for I/O and memory instructions I/O 與記憶體指令同格式

<b>Universal Serial Bus (USB)</b>
<b>Programmed I/O 程式化 I/O</b>
<b>Memory-mapped I/O 記憶體對映 I/O</b>
<b>Isolated I/O 隔離式 I/O</b>
<b>DMA 直接記憶體存取</b>
<b>Interrupt-driven I/O 中斷驅動式 I/O</b>

8. Please **connect their corresponding protocol** for both sides. 請連結雙邊對映協定

Internet Service Provider 網際網路服務供應商
A protocol for accessing data on WWW WWW 存取資料協定
A protocol for Email service 電子郵件服務協定
A protocol for file transfer 檔案傳輸協定
A protocol of Internet 網際網路協定

<b>SMTP</b>
<b>FTP</b>
<b>TCP/IP</b>
<b>ISP</b>
<b>HTTP</b>

9. Please describe the whole bootstrap process in detail when PC is turned on. 請詳述電腦開機時的整體啟動過程

10.  $1011011.0111_2 = \underline{\hspace{2cm}}_{10}$

$11011011_{2's \text{ with } 8\text{-bit}} = \underline{\hspace{2cm}}_{10}$

11.  $101.34375_{10} = \underline{\hspace{2cm}}_2 = \underline{\hspace{2cm}}_{16}$

12. (a) What are major differences between **SRAM and DRAM**? 靜態與動態記憶體有何主要不同 (b) Please list the five layers of **TCP/IP protocol** employed in Internet. 請列出網際網路 TCP/IP 協定的五層

