所別：**通訊工程學系碩士班 丙組**　　　科目：**計算機系統**
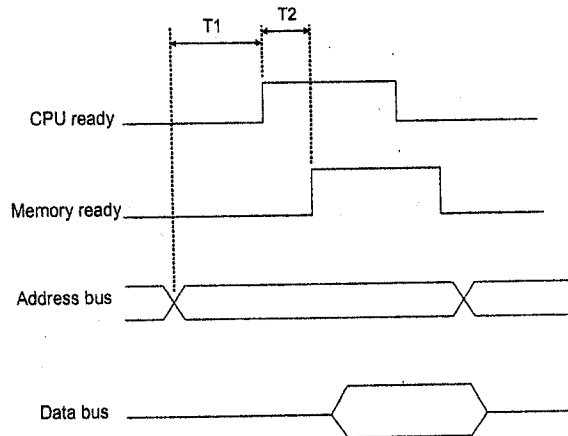
1. (35%)Please explain
   (1) SoC
   (2) DMA
   (3) VoIP
   (4) Firewall
   (5) Advantage/disadvantage for the schemes of write-back v.s. write-through in cache memory

2. (15%) Use examples to describe which kinds of hazards may occur in the pipeline architecture? And, for each kind of hazard, please provide one possible scheme to improve it.

3. A bus timing diagram for a memory read cycle is illustrated as follows. Please describe
   (1) (7%) Operation scenario of this timing chart
   (2) (8%) Meaning of T1 and T2

4. (10%) Describe the operation scenario among DNS, Proxy server, Web server, and the PC client when the client accesses a Web page.

5. (13%) What is purpose of flow control? If we already have flow control on layer 2, is it necessary to have flow control in the layers beyond layer 2? Why?

6. (12%) Please compare the following technologies
   (1) 3G v.s. WLAN
   (2) I/O pooling v.s. I/O interrupt