

國立臺北科技大學九十五學年度碩士班招生考試

系所組別：1810 資訊工程系碩士班甲組

第一節 作業系統 試題

填准考證號碼

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第一頁 共一頁

注意事項：

1. 本試題共【十】題，每題10分，配分共100分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

- 一、Consider a simple paging system with the following parameters: 2^{30} bytes of physical memory; page size of 2^{11} bytes; 2^{14} pages of logical address space.
 1. How many bytes are there in a frame?
 2. How many bits are there in a logical address?
 3. How many bits are there in the physical address specify the frame?
 4. How many entries are there in the page table?
 5. How many bits are there in each page table entry? Assume each page table entry includes a valid/invalid bit.
- 二、The system call `fork()` provided by UNIX/Linux operating systems is used to create a new process which will duplicate the data space of the original process. Without memory management unit (MMU), `fork()` will not be able to work properly. Please give a discussion on this issue. (Note: Here MMU refers to all kinds of address translation mechanisms.)
- 三、What does it mean by “preemptive” and “non-preemptive” in process scheduling?
- 四、Please discuss the reason why most operating systems used in desktop computers are not real time systems. (That is, why they may miss the deadline requirement?)
- 五、Given a disk with 200 tracks. Assume the disk head is initially located at track 100 and was walking in the direction of increasing track number. Let the requested tracks, in the order received by the disk scheduler, be 55,

58, 39, 18, 90, 160, 150, 38, and 184. How many head movements will be involved for the FIFO, SSTF, SCAN, and C-SCAN disk scheduling algorithms respectively? (Note: Here both SCAN and C-SCAN implements the LOOK policy.)

- 六、Discuss the potential performance advantages of implementing an application as a collection of threads to a collection of processes.
- 七、Describe the role of middleware in client/server architecture.
- 八、Describe the deadlock detection algorithm proposed by E. Coffman, etc. which uses allocation matrix, available vector, request matrix, etc. for representing the amount of resources involved in the detection process.
- 九、Make a comparison between monolithic operation systems and microkernel operation systems.
- 十、Define each of the following terms:
 - 1. race condition
 - 2. nucleus