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淡江大學 99 學年度碩士班招生考試試題

系別：資訊工程學系
資訊工程學系資訊網路與通訊碩士班

科目：作業系統

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- (a) Draw a diagram to show the transitions between process states. (10%)

(b) What are the differences between preemptive scheduling and non-preemptive scheduling? (10%)
- Suppose that a disk drive has 5,000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 3143, and the previous request was at cylinder 4225. The queue of pending requests, in FIFO order, is
2186, 1740, 93, 1774, 890, 3150, 1022, 2750, 4320, 1753

Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk-scheduling algorithms? (10%)

(a) SSTF, (b) C-LOOK.
- In a multi-level paging system, the length of a logical address is 32-bit and the page size is 8K bytes. Normally, a logical address is divided into two fields: a page number and a page offset. If the page table is too large, it is also paged. (20%)

(a) How many fields will be divided for a logical address in this scheme? How many bits are contained in each of the fields? Why? (4%)

(b) Draw a diagram to illustrate the translation from a logical address to its corresponding physical address for this system. (4%)

(c) What is the maximum number of memory frames required for the page table of a process? Why? (4%)

(d) How many memory references are required for accessing an instruction in memory? Why? (4%)

(e) Are there any techniques available to reduce the memory access time for fetching an instruction? Describe the technique in details, if available. (4%)
- Suppose the block size in a Unix file system is 8 KB. (10%)

(a) How many blocks are needed for a file of size 25 MB? (5%)

(b) Show its Unix inode structure. (5%)
- What is the thrashing? How does it occur? (10%)
- Suppose that the indexed allocation method is used for file allocation with block size 1024 bytes. Assume that each index requires 4 bytes in the index block. Suppose there is a file of size 350 MB. (10%)

(a) How many levels of indexes are required? Why? (5%)

(b) Show how to locate the instruction with logical address at 25,000,000. (5%)
- Show the six-step procedure to perform DMA transfer. (10%)
- Show the structure of RAID 0 + 1 with a single disk failure. (10%)