

國立高雄應用科技大學
107 學年度研究所碩士班招生考試
資訊工程系碩士班
作業系統

試題 共 2 頁，第 1 頁

- 注意：a. 本試題共 11 題，共 100 分
b. 作答時不必抄題
c. 考生作答前請詳閱答案卷之考生注意事項

1. (8%) Please describe four activities of a typical operation system.
2. (12%) Consider the following page reference string:

1, 2, 3, 2, 1, 4, 3, 1, 3, 5, 3, 1

Assume there are three frames and all frames are initially empty. How many page faults would occur for the following replacement?
 - (a) FIFO replacement
 - (b) LRU replacement
 - (c) Optimal replacement
3. (16%) (a) Please describe briefly the necessary conditions for deadlock.
(b) How to detect a deadlock?
(d) If a deadlock is detected, how to resolve the deadlock?
4. (5%) There are five jobs A,B,C,D, and E with run times of 6, 4, 3, 2, and 5 minutes, respectively. Assume they arrive at time 0, 1, 2, 3, and 4. If **SJF** scheduling algorithm is applied, what's the average turnaround time?
5. (12%) Please explain the following terms:
 - (a) Page fault
 - (b) Context switching
 - (c) Thrashing
 - (d) Direct memory access
6. (6%) Explain the differences between internal fragmentation and external fragmentation.
7. (9%) What are the requirements that the solution of critical section problem must satisfy? Please describe the answer briefly.

8. (9%) Please describe and compare the characteristics of level 0, 1, and 3 of the disk array.
9. (4%) With a 32-bit virtual address, 2KB page size, and 4 bytes per page table entry, what is the total size of page table?
10. (9%) In paging memory management, assumed there are 16 frames in the physical memory, and each frame size equals 4. The page table for a process is shown as following.

| | |
|---|----------------|
| 0 | f ₄ |
| 1 | f ₃ |
| 2 | f ₆ |
| 3 | f ₅ |

- (a) What's the physical address for the logical address of 14?
- (b) How many bits are there in the logical address?
- (c) How many bits are there in the physical address?
11. (10%) Please describe five performance criteria to compare CPU- scheduling algorithms.