

國立高雄應用科技大學
106 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 9 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. (16%) Consider the following set of processes, with the length of the CPU burst time given in milliseconds:

Process	Burst Time	Priority
P1	11	3
P2	1	5
P3	3	1
P4	2	4
P5	4	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time

0. What is the average waiting time for each of the following scheduling algorithm?

- (a) FCFS
 - (b) Short Job First
 - (c) Non-preemptive Priority (smaller priority number implies higher priority)
 - (d) Round-Robin(quantum=2)
2. (12%) Consider the following page reference string:
1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6
- How many page faults would be occur for the following replacement algorithms, assuming 5 page frames? All frames are initially empty.
- (a) FIFO replacement
 - (b) LRU replacement
 - (c) Optimal replacement

3. (18%) Please explain the following terms:
 - (a) DMA
 - (b) Critical section
 - (c) Context switching
 - (d) CPU utilization
 - (e) Belady's Anomaly?
 - (f) Semaphore

4. (10%) (a) What are the necessary conditions for a process "Deadlock"? (b) Please explain each condition.

5. (10%) Please explain briefly what deadlock prevention is.

6. (8%) What is thrashing? How can we prevent it?

7. (12%) Explain the difference between internal fragmentation and external fragmentation? Which one occurs in paging system? Please explain your answer.

8. (8%) What is the Page Fault? Please list steps to process a page fault.

9. (6%) Consider a byte oriented logical address space of eight pages of 1024 bytes each, mapped onto a physical memory of 32 frames.
 - (a) How many bits are there in the logical address?
 - (b) How many bits are there in the physical address?