

國立高雄科技大學 109 學年度碩士班 招生考試 試題紙

系所別：資訊工程系碩士班

組別：不分組

考科代碼：2032

考科：作業系統

注意事項：

- 1、各考科一律可使用本校提供之電子計算器，**考生不得使用自備計算器**，違者該科不予計分。
- 2、請於**答案卷上**規定之範圍作答，違者該題不予計分。

1. (12%) Please explain the following terms:
 - (a) Context switching
 - (b) Thrashing
 - (c) Convoy effect
 - (d) Direct memory access
2. (10%) Please describe five performance criteria for comparing CPU- scheduling algorithms.
3. (16%) Consider the following set of processes, with the length of the CPU burst time given in milliseconds:

Process	Burst Time	Priority
P1	15	3
P2	3	2
P3	5	1
P4	2	4

The processes are assumed to have arrived in the order P1, P2, P3, P4, 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)
4. (10%) (a) What is a critical section? (b) What are the requirements that the solution of critical section problem must satisfy?
 5. (12%) Consider the following page reference string:

1, 2, 3, 5, 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 be occurred for the following replacement.

- (a) FIFO replacement
- (b) LRU replacement
- (c) Optimal replacement

6. (8%) Please explain briefly what deadlock prevention is.

7. (10%) What is the safe sequence for the following snapshot of a system. Note that Resource available is (1,5,2,0)

Resource \ Process	Current Allocation				Maximum Demand			
	A	B	C	D	A	B	C	D
P1	0	0	1	2	0	0	1	2
P2	1	0	0	0	1	7	5	0
P3	1	3	5	4	2	3	5	6
P4	0	6	3	2	0	6	5	2
P5	0	0	1	4	0	6	5	6

8. (8%) Please describe the definition of **wait operation** and **signal operation** for binary semaphore.

9. (5%) Explain the difference between **logical** and **physical addresses**.

10. (9%) Please describe and compare the characteristics of level 0, 1, and 3 of the disk array.