國立高雄科技大學113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：3022　　考　科：作業系統

注意事項：

1、筆試可使用電子計算器之科目，由本校提供，**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. Explain the following terms:
   (1) Context switch (5%)
   (2) Thrashing (5%)
   (3) Turnaround time (5%)
   (4) Page fault (5%)
2. Suppose five processes A, B, C, D and E arrived in this order at the same time with the following CPU burst and priority values. A smaller value means a higher priority.

Process	CPU Burst	Priority
A	3	4
B	5	2
C	1	1
D	4	3
E	2	5

Copy the following table onto your answer sheet, then fill the table entries with waiting time for each indicated scheduling policy and each process. (2% for each table entry)

Scheduling Policy	Waiting Time				
	A	B	C	D	E
Non-Preemptive Shortest-Job First					
Priority					

3. Construct an inverted page table from the following page tables. (10%)

Process 1

0	3
1	7
2	1
3	5
4	9

Process 2

0	2
1	0
2	6
3	4
4	8

4. Consider a system with 3 physical frames of memory that is given the following page memory reference sequence:

   1, 2, 3, 4, 1, 2, 3, 4, 1, 2, 3, 4.

   What is the number of page faults that would occur in case of using the optimal page replacement algorithm? (10%)
5. What are the necessary conditions for a deadlock to occur? (10%)
6. Describe two situations in which spinlock can be more appropriate than blocking mutex lock. (10%)
7. Suppose that a hard disk drive has 200 cylinders, numbered from 0 to 199. The drive is currently serving a request at cylinder 100, and the previous request was at cylinder 117. The queue of pending requests on cylinders, in FIFO order, is: 20, 130, 110, 190, 40, 10, 120. What is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests in case of using C-SCAN scheduling? (10%)
8. Consider three CPU scheduling algorithms, namely First-Come-First-Served, Round-Robin, and Shortest-Job-First. For short jobs, rank the three algorithms in the increasing order of average waiting time. (10%)