

明新科技大學 100 學年度研究所考試入學招生 試題卷

系所類別	科目	節次	准考證號碼 (考生請填入)	考試 日期
電機工程系碩士班 (資工組)	作業系統	第二節		100/4/24

※答案須寫在答案卷內，否則不予計分。

1. Explain the differences among process, programs and threads? (20%)
2. Please draw the state diagram of a type process. (20%)
3. Page replacements are used to find the least page fault times. How many page fault times will be generated under the following page replacement strategies with 3 frames and the reference stream – 1,2,3,2,1,5,2,1,6,2,5,6,3,1,3,6,1,2,4,3? (a) FIFO algorithm (b) Optimal algorithm (20%)
4. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

<u>Process</u>	<u>Arrival Time</u>	<u>CPU Burst Time</u>
P_1	0	130
P_2	0	62
P_3	0	86
P_4	0	137
P_5	0	120
P_6	200	65

The processes are assumed to have arrived in the order $P_1, P_2, P_3, P_4, P_5, P_6$ at the time 0, 0, 0, 0, 0 and 200 respectively.

- (a) Draw six Gantt charts illustrating the execution of these processes using SRT(Shortest Remaining Time First) and FCFS(First Come First Served) scheduling. (10%)
- (b) What is the average turnaround time for each of the scheduling algorithms in question (a)? (5%)
- (c) What is the average waiting time for each of the scheduling algorithms in question (a)? (5%)

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5. Consider the snapshots of an operating system with five processes P_1 through P_5 and four resources A, B, C and D. This quantity of resources (A, B, C, D) is written as (5, 6, 8, 4). Please answer the following questions using Banker's algorithm. (a) What is the content of the matrix *Need*? (b) Is the system in a safe state? If yes, please find a safe sequence; if no, please explain it. (20%)

	Max				Allocation				Need			
	A	B	C	D	A	B	C	D	A	B	C	D
P_1	3	2	2	2	2	1	1	0				
P_2	2	1	1	2	0	1	1	0				
P_3	1	1	3	1	1	1	1	0				
P_4	3	4	2	2	1	1	2	1				
P_5	2	4	1	4	1	2	1	1				

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