

招生學年度	九十七	招生類別	碩士班
系所班別	資訊工程學系碩士班		
科目	作業系統與計算機組織		
注意事項	禁用計算機		

1. Propose an algorithm to solve the critical section problem for two processes. (10%)
2. Use the resource allocation graph to design a deadlock avoidance algorithm. (10%)
3. Describe the mapping between logical address and physical address in a paging system. (10%)
4. Describe the use of FAT in a file system. (10%)
5. Differentiate access lists from capability lists. (10%)
6. Assume an instruction cache miss rate for a program is 2% and a data cache miss rate is 4%. Suppose the frequency of all memory access instructions (load and store) is 50%. If a processor has a CPI of 2 without any memory stalls and the miss penalty is 100 cycles for all misses, determine how much faster a processor would run with a perfect cache that never missed. (10%)
7. Briefly explain the following terms: (a) Translation-Lookaside Buffer. (5%) (b) Redundant Arrays of Inexpensive Disks. (5%) (c) Branch Prediction Buffer. (5%) (d) Amdahl's Law. (5%)
8. What is overflow and underflow in a floating-point representation? Please give examples in IEEE 754 standard in single precision. (10%)
9. Assume that multiply instructions take 8 cycles and account for 40% of execution time. The other instructions require an average of 3 cycles for each instruction and account for 60% of execution time. What is the frequency of multiply instructions? (10%)