

國立臺灣科技大學  
九十三學年度博士班考試試題

系所組別：資訊工程系  
科目：計算機系統

總分 100 分

1. Please design a full adder using a four-way, 2-bit multiplexer. (10 %)
2. Please design a 4-bit carry-lookahead adder. (14 %)
3. Please design a 4-bit synchronous binary counter using JK flip-flops. (16 %)
4. Consider the Tower of Hanoi. (a) Derive the recursive formula for the number of moves required when  $n$  rings are assumed. (4 % ) (b) Solve this recursive equation (10%)
5. (a) What is *B-tree*? (10 %) (b) Write a Pseudo code to delete an element  $x$  from a linked list  $L$ . (10 %)
6. What are benefits of multithread programming? (12 %) What are OSI seven layers? Also describe responsibility for each layer. (14 %)

