

國立臺北科技大學九十五學年度研究所博士班招生考試

系所組別：1250 電機工程系戊(計算機)組

計算機理論 試題

填准考證號碼

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注意事項：

1. 本試題共 8 題，配分共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

1. For the infix expression $A - B * (C + D) / (E - F) + G$
 - (a) (5%) Convert the infix expression to a prefix expression.
 - (b) (5%) Convert the infix expression to a postfix expression.

2. (10%) Support an array with 40 rows and 50 columns is stored in column major order starting at address 20. If each entry in the array requires two memory cells, what is the address of the entry in the third row and fourth column?

3. (10%) Design an algorithm to compute the "Depth" of a tree -- the number of nodes along the longest path from the root node down to the farthest leaf node.

4. (10%) From the following list, extract a collection of numbers whose sum is 3095:
25, 49, 103, 197, 403, 501, 773, 994, 1106, 1573
What is the complexity of your technique for solving this problem? Does this appear to be a polynomial problem or a non-polynomial problem?

5. (10%) Consider a system consisting of four resources of the same type that are shared by three processes, each of which needs at most two resources. Show that the system is deadlock-free.

6. (10%) Which of the following programming techniques and structures are "good" for a demand-paged environment? Which are "not good"? Explain your answers.
(a). Stack (b) hashed symbol table (c) sequential search (d) binary search

7. (10%) What is the problem with FCFS scheduling with disks?

8. Define each of the following terms.

- (a) (5%) mutual exclusion
- (b) (5%) atomic operation
- (c) (5%) busy waiting
- (d) (5%) AVL tree
- (e) (5%) B tree
- (f) (5%) threaded tree