國立嘉義大學九十四學年度

資訊管理學系碩士班招生考試試題

科目:資料結構

- 一、簡答題(每題5%,共20%)
- 1. 已知某 binary tree 的後序追蹤為 HJBFGDECA, 而中序追蹤為 HBJAFDGCE, 請 繪出此二元樹。
- 2. 就下列資料而言,你認為 merge sort、selection sort、quick sort、bubble sort、或 heap sort 那一個最為合適,為什麼?請說明你的理由與考量點。

3. 有一個程式如下:

```
int F(int n) {
  if( n == 0 ) return 0;
  if( n == 1 ) return 1;
  if( n == 2 ) return 2;
  return (F(n-1) - F(n-2) + F(n-3));
}
```

- (1) F(5) 的回傳值是多少?
- (2) F(n)共被呼叫多少次?(含F(5))
- 4. We have an array A (as shown in the following table) which is used to represent the complete binary tree.

i	1	2	3	4	5	6
A[i]	22	14	9	6	11	2

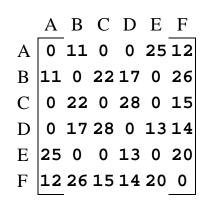
Please answer these 3 questions:

- (1) Draw the corresponding binary tree T.
- (2) Is T a max heap or min heap? Why?
- (3) Sequentially do three heap operations: INSERT(17), INSERT(29), DELETE on T. Show the results after each operation. (Draw the trees.)

二、申論題(每題20%,共80%)

- 1. Write a program (in C/C++) that can reverse a linked list. Explain the data structure of your linked list first.
- 2. 請依序畫出下列資料所建構出的 B-Tree of order 3。

3. The following matrix represents an undirected graph with weighted edges, please show



- (1) its adjacency list (without the weight values),(NOTE: the adjacent nodes are linked by the increasing order.)
- (2) its dfs(F) spanning tree, (please mark the visited order with the number from 0 to 5.)
- (3) its bfs(C) spanning tree, (please mark the visited order with the number from 0 to 5.)
- (4) its minimum spanning tree.
- 4. Write the status of the list L={13, 7, 5, 37, 11, 29} after each phase of the following algorithms:
 - (1) radix sort with radix=10,
 - (2) quick sort,
 - (3) merge sort with recursive version,
 - (4) heap sort.