

淡江大學 103 學年度日間部轉學生招生考試試題

系別：資訊管理學系三年級

科目：資料結構

考試日期：7月20日(星期日) 第3節

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Notice : Please make your answers as clear and readable as possible

1. The intermediate results of a sorting process are shown below. Please indicate which sorting method is used and explain why. (20%)

(29 8 37 4 81 12 69 15 50 20)

(12 8 20 4 15 29 69 81 50 37)

(4 8 12 20 15 29 69 81 50 37)

(4 8 12 20 15 29 69 81 50 37)

(4 8 12 15 20 29 69 81 50 37)

(4 8 12 15 20 29 50 37 69 81)

(4 8 12 15 20 29 37 50 69 81)

(4 8 12 15 20 29 37 50 69 81)

2. (a) Please explain sequential search and binary search.

(b) Please discuss their time complexities. (20%)

3. Regarding hashing, answer the following questions.

(a) Give two properties of a good hashing function.

(b) Give a good hashing function.

(c) Define linear probing.

(d) Define chaining. (20%)

4. (a) Nine integers are inserted into an empty max heap in the following order.

Please draw the final max heap. The properties of the max heap must be kept after each integer is inserted.

50, 43, 38, 82, 94, 16, 25, 45, 56

- (b) With the following declaration, please give the algorithm for inserting an integer (a node) into a max heap. You may define and use the necessary parameters.

```
int heap[MAX_SIZE]; /* MAX_SIZE is the maximum heap size */ (20%)
```

5. The order of the nodes visited in a binary tree T using preorder traversal is

F, A, H, I, B, L, J, E, D, G, K, C, M. If inorder traversal is used, it is

H, I, A, L, B, J, F, D, G, E, K, M, C. Please draw the binary tree T. (20%)