

# 大同大學 九十二 學年度 轉學考試 試題

考試科目：資料結構 系別：資訊經營學系 第 1 頁，共 1 頁

註：本次考試不可以參考自己的書籍及筆記； 不可以使用字典； 不可以使用計算器。

1. Give the contents of the hash table when the keys  $\{36, 42, 17, 26, 8, 52, 20, 6\}$  are inserted in order into an initially empty table of size 10.  $h_1(k) = k \bmod 10$ .
  - (a) Open addressing using linear probing. (5%)
  - (b) Open addressing using quadratic probing. (5%)
  - (c) Open addressing using double hashing,  $h_2(k) = 7 - (k \bmod 7)$ . (10%)
2. For the input  $\{36, 42, 17, 26, 8, 52, 20, 6\}$ .
  - (a) Draw the construction process of a binary heap. (10%)
  - (b) Show the result of performing *removeMin* operations in the heap (a). (10%)
  - (c) Draw the insertion process to construct an AVL tree. (10%)
  - (d) Draw the insertion process to construct a  $(2, 4)$  tree. (10%)
  - (e) Draw the insertion process to construct a red-black tree. (10%)
3. Find the shortest path of the graph in Figure 1.
  - (a) Apply *DIJKSTRA's* algorithm, starting at  $a$ . (5%)
  - (b) Use *WALLSHALL's* algorithm to find the shortest path of all pairs. (10%)
4. According to the Figure 2 to answer following questions.
  - (a) Order the vertices as they are visited in a DFS traversal starting at vertex  $a$ . (5%)
  - (b) Compute a topological ordering. (10%)

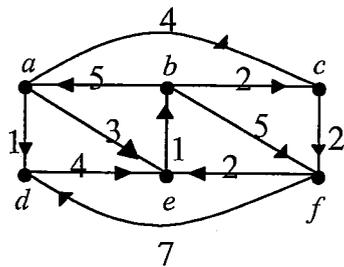


Figure 1

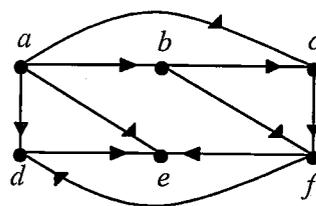


Figure 2