

科目：資料結構

系所組：電機工程所丙組

1. Rewrite the following infix expression into postfix and prefix forms. (5%)
(A - 2 * (B + C) - D * E) * F

2. Imagine that the contents of queue Q1 and queue Q2 are as shown front (left) to rear (right).
What would be the contents of Q3 after the following code is executed? (10%)

Q1: 42 30 41 31 19 20 25 14 10 11 12 15
Q2: 4 5 3 10 5

```
Q3 = createQueue;
count = 0;
loop (not empty Q1 and not empty Q2)
  count = count + 1;
  dequeue(Q1, x);
  dequeue(Q2, y);
  if (y equal count) enqueue(Q3, x);
  enqueue(Q3, count);
```

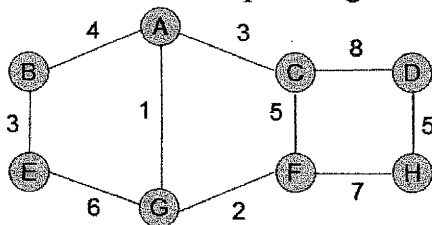
3. Given that A[3,2]=1100, A[2,3]=1144, and the size of data element is 4, please find the location of A[4,5]. (5%)

4. The breadth traversal of the tree with nine nodes is given below. Suppose the tree is a nearly complete binary tree. Draw the tree. (10%)

Breadth traversal of the tree: JCBADefIG

5. For the undirected graph given below,

- (a) Write the adjacency matrix of the graph. (5%)
- (b) Write the adjacency list of the graph. (5%)
- (c) Find the minimum spanning tree of the graph. (10%)
- (d) Calculate the shortest path lengths from vertex A to all other vertices. (10%)



※注意：1.考生須在「彌封答案卷」上作答

2.本試題紙空白部分可當稿紙使用。

3.考生於作答時可否使用計算機、法典、字典或其他資料或工具，以簡章之規定為準。

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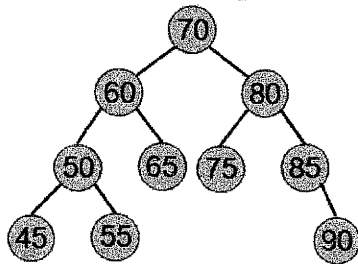
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6. Given a set of data : 803, 211, 39, 12, 5, 88, 555, 147, use the following methods to sort the data. Please write details of the sorting procedure.

- (a) Bubble sort. (5%)
- (b) Selection sort. (5%)
- (c) Quick sort. (5%)
- (d) Merge sort. (5%)

7. Given a binary search tree as follow,

- (a) Delete the node containing 60 from the binary search tree and draw the result. (5%)
- (b) Convert the new binary search tree into a heap by heap sort. (10%)
- (c) Show the array implementation of the heap. (5%)



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