

1. (15%) Which of the following sorting algorithms can be used to sort a random linked list with minimum time complexity? Please justify your answer.
  - A. Insertion sort
  - B. Quick sort
  - C. Heap sort
  - D. Merge sort
2. (15%) Provide a pseudo code that reverses a singly linked list. Your code should take the head of the linked list as the input. No output.
3. (15%) The following postfix expression with single digit operands is evaluated using a stack:  
 $8 2 3 ^ / 2 3 \times + 5 1 \times -$   
Note that  $^$  is the exponentiation operator. What are the top two elements of the stack after the first  $\times$ , the multiplication operator, is evaluated?
4. (15%) If you are given two traversal sequences, can you construct the binary tree? Write a pseudo code to implement your answer. Please return the root of the binary tree as the output.
5. (10%) What is the best case complexity in building a heap? Please justify your answer.
  - A.  $O(n \cdot \log n)$
  - B.  $O(n^2)$
  - C.  $O(\log n)$
  - D.  $O(n)$
6. (15%) How do you print all nodes of a given binary tree using inorder traversal without recursion?
7. (15%) Given a directed graph, check whether the graph contains a cycle or not. Your pseudo code should return true if the given graph contains at least one cycle, else return false.

試題隨卷繳回