

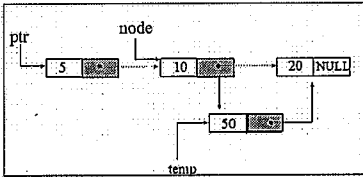
大同大學 九十四 學年度 轉學考試 試題

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。

- (15%) If the value of A, B, C, and D are 2, 3, 4, and 5, respectively,
 - calculate the value of the following postfix expression: $A B * C - D +$
 - calculate the value of the following prefix expression: $- * A + B C D$

- (15%) The below figure shows the list after we insert *temp* after the *node* in the list. Fill the blanks to complete the insert function.



```
void insert(list_pointer *ptr, list_pointer node) {  
    list_pointer temp=(list_pointer)malloc(sizeof(list_node));  
    temp->data=50;  
    if (*ptr) {  
        temp->link= ① ;  
        node->link= ② ; }}
```

- (15%) For each of the following applications, indicate the most appropriate data structure and explain the reasons.
 - Sending backlog orders to customers in the order they have been received.
 - Implementing a calculator for computing simple arithmetical expressions.

- (15%) Is the quicksort a stable sorting algorithm? Give an example to explain.

- (20%) (a) What is the largest number of key comparisons made by binary search in searching for a key in the following array?

3	14	27	31	39	42	55	70	74	81	85	93	98
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(b) Find the average number of key comparisons made by binary search in a successful search in this array. (Assume that each key is searched for with the same probability.)

- (20%) Sort the following list by heapsort by using the array representation of heap: 2, 9, 7, 6, 5, 8 (in increasing order).