國立中正大學
113學年度碩士班招生考試
試 題

[第2節]

科目名稱	資料結構
系所組別	資訊管理學系-乙組

－作答注意事項－

※作答前請先核對「試題」、「試卷」與「准考證」之系所組別、科目名稱是否相符。

1. 預備鈴響時即可入場，但至考試開始鈴響前，不得翻閱試題，並不得書寫、畫記、作答。
2. 考試開始鈴響時，即可開始作答；考試結束鈴響畢，應即停止作答。
3. 入場後於考試開始40分鐘內不得離場。
4. 全部答題均須在試卷（答案卷）作答區內完成。
5. 試卷作答限用藍色或黑色筆（含鉛筆）書寫。
6. 試題須隨試卷繳還。

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科目名稱：資料結構　　本科目共 2 頁　第 1 頁

系所組別：資訊管理學系-乙組

1. If n is 8, then what the variable space requirement of this program is? (6 pt)

```
float sum(float list[ ], int n)
{
  float tempsum = 0;
  for (int i = 0; i<n; i++)
      tempsum += list[i];
  return tempsum;
}
```

2. Calculate the total steps of the following function (6 pt)

```
float rsum(float list[ ], int n)
{
 if (n)
     return rsum(list, n-1) + list[n-1];
 return list[0];
}
```

3. Please transform the expressions from prefix to postfix. (12 pt)

(A) -+-/abc*de*ac

(B) -/*a+bcdg

4. Which(s) is/are true in the following descriptions? (24 pt)

(A) &a->val means (&a)->val

(B) The worst-case complexity of the maze is O(mp), where m and p are the number of rows and columns of the maze respectively.

(C) a%b*c==3 means (a%(b*c))==3

(D) a==3 || b==4 && c==5 means ((a==3) || (b==4)) && (c==5)

(E) The time complexity of O(2^n) is higher than O($n!$).

(F) Prefix notation requires the use of parentheses to indicate the precedence of operands.

5. The following is a circular queue. Please find and correct the errors. (12 pt)

```
element deleteq()
{
   element item;     /* hint: MAX_QUEUE_SIZE */
   front = front+1;
   if (front == rear)
       return queueEmpty( );
   return queue[front];
}
```

6. Please complete the code of function invert to perform the action for "Invert single linked list". (20 pt)

```
typedef struct list_node *list_pointer;
typedef struct list_node {
        char data;
        list_pointer link;
};

list_pointer invert(list_pointer lead)
{
        list_pointer middle, trail;
        middle = NULL;
        while (.....) {
                .....
                .....
                .....
                .....
        }
        return middle;
}
```

7. If the order of moving is as follows (left graph), please draw the maze path in the right graph (where 1 is blocked path and 0 is through path). (20 pt)