

國立中央大學 資訊工程學系
九十七學年度 碩士在職專班 招生入學考試命題紙

科目： 計算機概論 (含資料結構) 第一頁 共二頁

1.(10%) What is the output of the following C program? (suppose the necessary libraries have been included, and pointer arithmetic performs according to the array in the main function)

```
int f1(int * i)
{
    int b = 0;
    if ( (*i) == 0) { return 0 };
    else { cout << (*i) << endl;
          b = (3 * (*i));
          b += f1( (++i) ); }
    return ( b );
}

int main()
{ int a[8] = {3,7,9,5,2,0,1,8};
  cout << f1( &a[0] );
  return 0;
}
```

2. (10%) Re-implement the “f1” function in 1, but use only loops (while/for/do-while) instead of recursive mechanism.

3 (10%). What is a “linker” when compiling and executing a program? What is a “loader”?

4.(10%) (a) (5%) if the result of ((10110001) XOR (00111101)) is in 2’s complement format, what’s the decimal representation of that result?

(b) (5%) Use 8 bit 2’s complement format to represent: (-27).

5.(10%) Explain what is “pass by value” and what is “pass by reference” mechanisms.

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科目： 計算機概論 (含資料結構) 第二頁 共二頁

6. (15%) Assume the edges of a graph are as follows:

A,B A,C B,C B,D C,E D,E

- (a) (5%) Draw a sketch showing the graph.
- (b) (5%) Perform depth-first iteration from A using a stack. Show change of the stack and the output.
- (c) (5%) Perform breadth-first iteration from A using a queue. Show change of the queue and the output.

7. (10%) In open hashing, with the quotient-offset collision handler, insert the followings into a table of size 11: 20, 33, 49, 22, 26, 202, 140. Show the result.

8. (10%) Construct a binary tree t such that: t is a two-tree; t is complete; $\text{height}(\text{leftTree}(t)) = \text{height}(\text{rightTree}(t))$; and t is not full.

9. (10%) The array below denotes a min-heap: 1 3 4 5 8 9 6

- (a) (5%) Draw a sketch showing the heap.
- (b) (5%) Draw the sketch after inserting 2 to the heap.

10. (5%) Show the result of inserting the followings into an initially empty binary search tree: 30, 35, 22, 89, 11, 50, 71, 62, 88.