

# 國立彰化師範大學 99 學年度碩士班招生考試試題

系所：資訊工程學系

科目：資料結構及程式設計

☆☆請在答案紙上作答☆☆

共 3 頁，第 1 頁

1. Assume variable `z` is declared as a two dimensional array as follows. Choose the terms which are equivalent to `z[2][1]`. (multiple-choice, more than one answer) (6%)

```
int z[4][2] = {.....};
```

(A) `*(z+2)+1` (B) `*(zip[2]+1)` (C) `(z+2)[1]` (D) `*(*(z+2)+1)`

2. Choose the keywords which can be paired with "break". (multiple-choice, more than one answer) (4%)

(A) `if` (B) `switch` (C) `do` (D) `continue` (E) `return`

3. Function `strlen` computes and returns the length of a string. What should this function return? (5%)

```
int strlen(const char* s)
{
    const char *p = s;
    while (*s)
        s++;
    return _____
}
```

4. Write the output of the following program. (8%)

```
struct N {
    char *s;
    struct N * ptr;
};
struct N a[] = {{"abcd", a+1}, {"efgh", a+2}, {"ijkl", a}};
struct N *p = a;

printf("%s\n", a[0].s);
printf("%s\n", (p++)->s);
printf("%s\n", a[2].ptr->s);
printf("%s\n", ++(p->s));
```

5. Write the output of the following program. (6%)

```
int i;
int func1(int n) { static int i=0; return i += n; }
int func2(int n) { return i += n; }

int main(void)
{
    int i=0, s, t;
    for (i=100; i>=0; i--) {
        s = func1(i);
        t = func2(i);
    }
    printf("s = %d\nt = %d", s, t);
}
```

# 國立彰化師範大學 99 學年度碩士班招生考試試題

系所：資訊工程學系

科目：資料結構及程式設計

☆☆請在答案紙上作答☆☆

共 3 頁，第 2 頁

6. Write the output of the following program. (6%)
- ```
int i, j, k = 0, a[4][4];
int (*p)[4] = a+1;
int *q = a[2]+1;

for (i=0; i<4; i++)
    for (j=0; j<4; j++)
        a[i][j] = ++k;
for (i=0; i<4; i++) {
    printf("%d ", *(*p+i));
    printf("%d\n", *(q+i));
}
```
7. Write the output of the following program. (6%)
- ```
void func(int n)
{
    if (n > 1)
        func(n/2);
    printf("%d", n % 2);
}
int main()
{
    func(199);
    return 0;
}
```
8. Write the output of the following program. (4%)
- ```
int a = 11, b = 2, c = 7;
printf("%d\n", a+b+-++c);
printf("%d\n", a = b += c);
printf("%d %d", a, b);
```
9. Write the output of the following program. (5%)
- ```
void func(int n)
{
    printf("%3d", n);
    if (!n) {
        printf("\n%3d", n, n);
        return;
    }
    func(n-1);
    printf("%3d", n);
}
int main(void)
{
    func(5);
    return 0;
}
```

# 國立彰化師範大學 99 學年度碩士班招生考試試題

系所：資訊工程學系

科目：資料結構及程式設計

☆☆請在答案紙上作答☆☆

共 3 頁，第 3 頁

10. Read the following data in the given order, and show the corresponding trees. (20%)  
19, 13, 16, 22, 6, 17, 25, 37, 8, 31, 2, 28, 33  
(1) Binary search tree  
(2) AVL tree  
(3) 2-3 tree  
(4) Min-Max Heap  
(5) B tree of order 5
11. How many different binary trees are there with n nodes? Why? (10%)
12. Try to write two procedures Push(s) and Pop(s) for stack operation. You can use any programming language you are familiar with. (10%)
13. When we traverse a tree, we find the tree in post-order is DBGEHJFCA and the tree in in-order is DBAEGCHFJ, please draw the tree. (10%)