

招生學年度	103	招生類別	碩士班
系所班別	電機光電碩士班聯合招生 (電機工程學系碩士班、電機工程學系 電子工程碩士班、光電工程學系碩士班)		
科目名稱	計算機概論		
注意事項	本考科可使用掌上型計算機		

1. Please write down the sorting (from the smallest number to the largest number) procedure for each step on the following sequence by using the insertion sort.

85 31 96 17 42 16 55 (10%)

2. Please show the output of following C code. (10%)

```
int array[5][2]={{6, 2}, {3, 5}, {1,7},{3,2},{5,2}};
int r, c;
for(r=0; r<1; ++r)
{
    for(c=0; c<5; ++c)
        printf("%d ",array[c][r]);
    printf("\n");
}
```

3. Here is the prototype of a function in C program:

```
void five(double x, double *yp, int *zp);
```

Given these variable declarations, which call to five is valid? (5%)

```
int m, n;
```

```
double p, q;
```

- (a) five(&m, &p, &n);
- (b) q = five(6.2, &p, &m);
- (c) five(7.1, &p, &n);
- (d) five(6, p, m);

4. Please write n! by recursive function in C program. (10%)

5. A pulse signal is sampled 800 times per second. Each sample is represented by 4096 different levels. How many bits per second are needed to represent this signal? (10%)

6. If you got (1) ECG circuit (with amplify and filter function), (2) ADC interface (ex. DAQ with USB), (3) PC with Win.7, (4) Labview package. Could you design a computer system with heart rate computation function? (15%)

7. Describe, in general, the limitations computers have regarding numbers and arithmetic. (10%)

8. Compare and contrast a computer virus and a computer worm. (7%)

9. What is an expert system for computer applications? (7%)

10. Compare and contrast an electric analog signal and an electric digital signal. (6%)

11. (a) Convert the following base 13 number to hexadecimal: 998, (5%)

(b) Convert the following decimal number to binary: 297. (5%)