

4. (12 points) Following C code tries to calculate $17! = 1 \times 2 \times \dots \times 16 \times 17$ but it generates a wrong output result "17!=-288522240" as shown in output example below (In fact, $17! = 355687428096000$). Explain why following code generates the wrong result. (Explain what is wrong.)

()

```
#include <stdio.h>

int factorial(int n)
{
    int i, product=1;
    for (i=2; i<=n; i++) product=product*i;
    return product;
}

int main()
{
    printf("17!=%d\n", factorial(17));
    return 0;
}
```

Output example:
17!=-288522240

5. (18 points) (1) Consider the C program segment given below. What will be printed by **printf** function?

()

```
int i=1, value = 1;
for (i=1; i<7; i++) {
    value += (i%2);
}
printf("%d,%d\n", i, value);
```

(2) Consider the C program segment given below. What will be printed by **printf** function?

()

```
int i=1, j=1, value = 1;
for (i=1; i<7; i++) {
    value += (i%2)*j++;
}
printf("%d,%d,%d\n", i, j, value);
```

6. (18 points) What does following C program print as output? ()

```
#include <stdio.h>

int main()
{
    int i, x=87654, number=87654, count=0;
    while (x>0) {
        x = x / 10;
        count++;
    }

    for (i=0; i<count/2; i++) number = number /10;
    printf("%d,%d,%d,%d\n", i, count, x, number);
    return 0;
}
```