請在答案卷上標明題號依序作答

1. (20%)

(a) What is pilelining ?

(b) What is DNS server?

(c) Can you explain what is client/server model?

(d) What is the difference between TCP and UDP?

2.(10%)

(a) Show the hexadecimal representation (32 bits) of integer 10213.

(b) Show the hexadecimal representation (32 bits) of integer --10213 in two
complement format.

3. (20%)

Bubble sort is a well-know sorting algorithm. It is based on the process of repeatedly comparing two adjacent names and interchanging them if they are not in the correct order relative to each other. Let us suppose that the list in question has n entries. The bubble sort would begin by comparing (and possibly interchanging) the entries in positions n and n-1. Then, it would consider the entries in positions n-1 and n-2, and continue moving forward in the list until the first and second entries in the list has been compared (and possibly interchanged). Observe that this pass through the list will pull the smallest entry to the front of the list. Likewise, another such pass will ensure that the next to the smallest entry will be pulled to the second position in the list. Thus, by making a total of n-1 passes through the list, the entire list will be sorted.

(a) Assume a list contains the following entries: 25, 57, 48, 37, 12, 92, 86, 33. Please show the list after applying the bubble sort algorithm described above **for each iteration** until the list has been sorted.

(b) Please write your pseudocode of the bubble sort algorithm.

4. (10%)

What is the output of the following C++ code?

```
#include <iostream>
using namespace std;
void swap1(int, int);
void swap2(int&, int&);

int main() {
```

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```
        int i=7;
        int j=-3;
        swap1(i,j);
        cout <<"i = "<< i << endl
             <<"j = "<< j << endl;
        swap2(i,j);
        cout <<"i = "<< i << endl
             <<"j = "<< j << endl;
        return 0;
    }


void swap1(int a, int b) {
    int t;
    t = a;
    a = b;
    b = t;
}


void swap2(int& a, int& b) {
    int t;
    t = a;
    a = b;
    b = t;
}
```

5. (10%)

If a software project has been behind the schedule, is it helpful to add more programmers?   Why?


6. (15%)

Draw diagrams to explain how to delete and insert data nodes in a linked list.


7. (10%)

(a) What is the hashing technique?

(b) How to deal with the collision situation using the hashing technique?


8. (5%)

Explain the importance of the Turing machine.

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