(25%) 1. Convert the following decimal numbers to binary.

(a) 45　(b) 69　(c) 1066　(d) 99　(e) 1

(20%) 2. Define the following terms.

(a) Random access memory

(b) Operating system

(c) Moore's law

(d) von Neumann architecture

(30%) 3. Write a function num_lines( ) that takes a pointer to an open text file as a parameter and returns as the function value the number of lines of text in the file.　You may assume that the last character in the file is the newline character.

(25%) 4. Give the truth values of following Boolean expressions after execution of the program segment below.

```
int v[5] = {0, 0, 0, 0, 1};
int k, j;
for (j = 3; j >= 0; --j)
    for (k = j; k < 4; ++k)
        v[k] += v[k + 1];
```

(a) v[0] = = v[4]　(b) v[1] = = v[3]　(c) v[0] < v[1]

(d) v[1] < v[2]　(e) v[2] < v[3]