題號： 426
科目： 計算機概論(B)
節次： 7

國立臺灣大學 106 學年度碩士班招生考試試題

題號：426
共 1 頁之第 1 頁

1. (10%) Convert the following two's complement representation to its equivalent base ten (i.e. decimal) representation.

    (a) 11101111   (b)00001101

2. (10%) Simplify the following Boolean algebra expression:

    $(X + \bar{Y})(\bar{X} + Y + \bar{Z})(Y + Z)$

3. (5%) (a) Describe the functions of compiler and interpreter, respectively, in a computer system.

    (5%) (b) What are the functions of registers and cache in a computer system? (5 points)

4. (10%) Describe the booting process of a computer system.

5. (5%) (a) What is the difference between stack data structure and queue data structure?

    (5%) (b) What is relational database?

6. (10%) Suppose a machine program with insertion sort algorithm takes an average of 0.1 second to sort a list of 100 names, estimate the time require to sort a name in a list of 1000 names.

7. (10%) If a machine program using binary search algorithm take 0.01 second to search a name in a sorted list of 100 names, estimate the time it takes to search a name in a sorted list of 10000 names.

8. (10%) Describe the working principle of CSMA/CD and CSMA/CA protocols used in computer networks.

9. (10%) What is public key encryption?

10. (5%) (a) Use Huffman coding to compress the following message:

    y x y   x y y y x   y x y   x y y y x   x y y y x
    What is this message's compression ratio of Huffman coding, compared to ASCII character encoding?

    (5%) (b) What would be the encoded version of the message if the above message is compressed using LZW algorithm, starting with the dictionary containing x, y, and a "space"?

試題隨卷繳回