銘傳大學九十二學年度資訊傳播工程學系碩士班招生考試
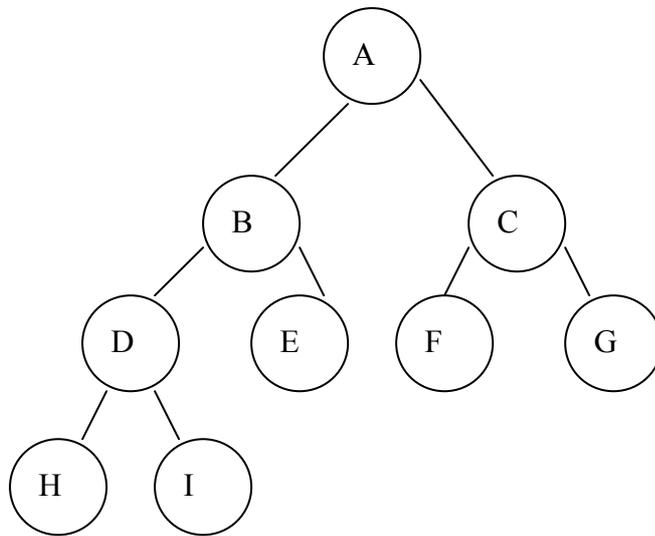
第一節

資訊概論 試題

1. (10%) Explain the following terms. (a) XML (b) RAID (c) CSMA/CD (d)PDA (e) Digital Watermark.

2. (12%) Convert each of the following base ten representation to its equivalent two's complement representation in which each value is represented in seven bits:

    (a) 12   (b) – 12   (c) – 1   (d) 0

3. (8%)If a two-dimensional array is declared as A[1···M, O··· N]. It is stored in row major order and each entry occupies two memory cells. We know that the address of A[3][5] is at 84 and the address of A[5][3] is at 144.

    (1) Find the address of the element A[2,2]
    (2) Find N=?

4. (9%)Name and describe the three major steps in the translation process of a programming language.

5. (8%) The most widely used encryption scheme is based on the Data Encryption Standard (DES) adopted in 1977 by National Bureau of Standards. For DES, data are encrypted in M-bit block using a N-bit key.

    (1) M=? N=?
    (2) Brief explain the DES encryption scheme.

6. (10%)Suppose we apply both Test 1 and Test 2 to the input value 1. Print the output of the two routines.

    (1) **procedur**e Test 1 (Count)
        if (Count not 5)
        then (print the value assigned to Count and
            apply Test 1 to the value Count +1)
    (2) **procedure** Test 2 (Count)
        if (Count not 5)
        then (apply Test 2 to value Count +1 and
            print the value assigned to Count and)

7. (8%)Implement the following Boolean functions using basic AND, OR, and NOT gates.

    (1)   f(A, B, C) = $\overline{A}B + A\overline{B}\,\overline{C}$
    (2)   f(A, B, C, D)=AB=A($\overline{C}D + CD$)

8. (6%) Digital images may be represented as either vector graphics or bitmapped images.

Brief explain and compare the two types of image.

9. (9%) Traversal the following tree by (1)preorder (2) inorder (3) postorder

10. (8%)Write a C/C++ function to test whether an input positive integer is a prime number or not

11. (12%)Heap sort needs a heap.
    (1) What is a Minimum heap?
    (2) What is the data structure we use to implement a Minimum heap?
    (3) Is it a good idea to use the data structure to implement a general tree? Why?