# 計算機概論 試題

1. (15%)Convert each of the following base ten representations to its equivalent two's complement representation in which each value is represented in seven bits:
   (a) 15　(5%)
   (b) -30　(5%)
   (c) -1　(5%)

2. (10%)Express the following values in binary notation:

   (a) $2\frac{3}{4}$　(5%)

   (b) $\frac{5}{16}$　(5%)

3. (10%)If a two-dimensional array is declared as A[1…M, 0…N]. It is stored row major order and each entry occupies two memory cells. We know that the address of A[1][0] is at 100 and the address of A[3][5] is at 174.
   (1) Find N=?. (5%)
   (2) Find the address of the element A[2,2]. (5%)

4. (10%) Suppose we apply both Test 1 and Test 2 to the input value 1. Print the output of the two routines.
   (1) **procedure** Test1(Count)　(5%)
      if (Count not 5)
      then (print the value assigned to Count and apply Test1 to the value Count +1)
   (2) **procedure** Test2(Count)
      if (Count not 5)
      then (apply Test 2 to the value Count +1 and print the value assigned to Count and)

5. (15%) Traversal the following tree using (1) preorder (2) inorder (3) postorder.
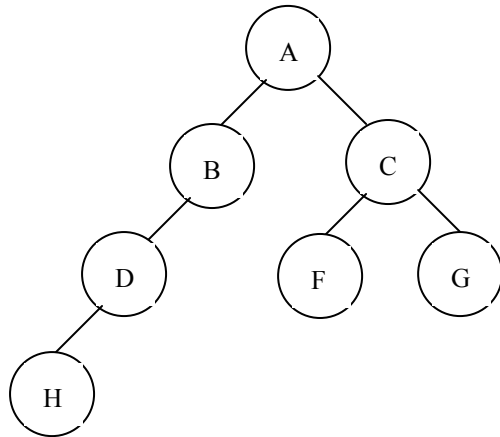
6. (10%) Write a C/C++ function swap() that exchanges the values of the two given double parameters.

7. (10%) Name and describe the three major steps in the translation process of a programming language.

8. (20%) Write a program using the giving machine language to add two numbers located in memory cells 5C and 5D and store the result in memory cell 5E.

Op-code Operand Description

Op-code	Operand	Description
1	RXY	LOAD the register R with the bit pattern found in the memory cell whose address is XY.
3	RXY	STORE the bit pattern found in register R in the memory cell whose address is XY.
5	RST	ADD the bit pattern found in register S and T as though they were two's complement representations and leave the result in register R.
C	000	HALT execution.

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