1. (5% each; 20% in total) Consider the asymptotic growth rates of the following.

(a). $(\lg n)!$ (b). $\lg(n!)$ (c). $4^{\lg n}$ (d). $(\frac{3}{2})^n$

Answer the following questions by T (true) or F (false)

(1) the order of (a) is greater than the order of (c)
(2) the order of (a) is greater than the order of (d)
(3) the order of (b) is greater than the order of (c)
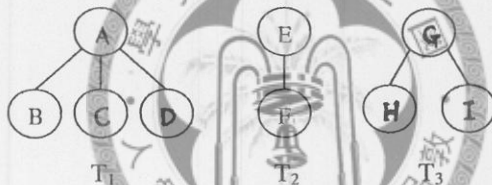(4) the order of (b) is greater than the order of (d)

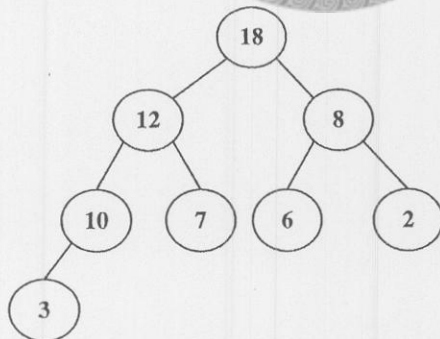2. (a) (10%) Write the postfix form of the following expression:
   (D/(A+B)+C)*D-C*D
   (b) (10%) What are the sequences of the post order traversals of the following tree?
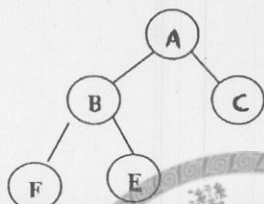
3 (a) (10%) Draw the binary tree representation of $B(T_2, T_1, T_3)$.

(b) (10%) Draw the resulting max heap if node with value 18 in the following is deleted.

4 (a) (10%) Please draw the binary tree with the following information
   Inorder Traversal: CBEDFAIHKJGLM
   Preorder Traversal: ABCDEFGHIJKLM
   (b) (10%) How many different ways can we perform the multiplications when we compute the product of 15 matrices: $M_1 \times M_2 \times \cdots \cdots \times M_{15}$.

5. (a) (10%) Please construct an AVL tree by adding the following item in order:
   MARCH, MAY, AUGUST, OCTOBER, AUGUST, APRIL, JUNE, FEBRAURY,
   DECEMBER, JANUARY, JULY, SEPTEMBER. (Please show the balance factor of
   each node in each step. Note that the comparison is based on alpha-beta order, e.g.,
   MAY>AUGUST and MARCH > JANUARY.)
   (b) (10%) If a tree with only one node is defined as height 1. What is the maximum
   and minimum height of an AVL tree with 400 nodes?

試題隨卷繳回