Exercise 6

(1) The following questions are just for your reference.

1 Answer the following questions according to the binary tree and the tree of Fig.1 respectively, in the: ①What is the root? ②What is a leaf node? ③which is parents of G? ④What are the ancestors of G? What is E ⑤descendants? What is E ⑥brother? What is brother of C? ⑦node B and I are the number of layers?

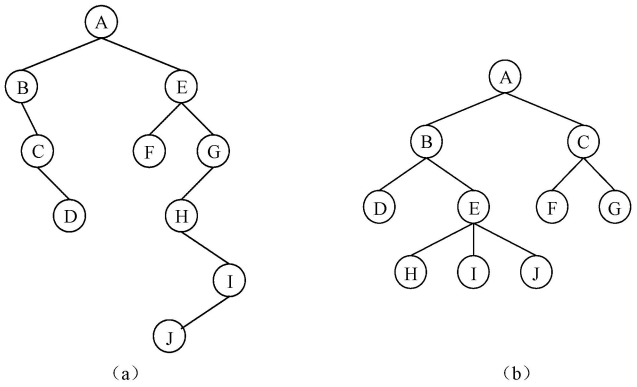


Fig. 1

2 Draw all the different forms three disordered tree and binary tree containing 3 node.

3 Take binary list and trigeminal linked list as storage structure respectively, achieve the following binary operations: ① PARENT(BT,X); ② CREATE(X,LBT,RBT); ③ DELEFT(BT, X).

4 Write the preorder, inorder and postorder sequence of binary tree shown in Fig.6.22(a).

5 Try to find out all the binary tree satisfy the following conditions: ① the preorder sequence and the inorder sequence is the same; ②the inorder sequence and the postorder sequence is the same; ③the preorder sequence and the postorder sequence is the same.

6 Take the binary list as the storage structure, try to implement a algorithm to find the depth of a binary tree.

7 A n-nodes complete binary tree stored in a sequential list, implement the no-recursive algorithm for preorder traversal.

8 Try to implement algorithm to determine whether two binary trees are equivalent. Binary trees T_1 and T_2 are called “equivalent” if they meet the following conditions: Both T_1 and T_2 are empty binary tree; or the roots of T_1 and T_2 have the same value, and the left sub-tree T_1 and T_2, are equivalent, right sub-trees of T_1 and T_2 are equivalent.

9 Try to implement the algorithm for exchanging all the nodes of left and right sub-tree (optional storage structure).

(2) The following problems must be solved and submitted bu you.

10 Try to draw the children list, children–sibling list and static parent list of the tree shown in Fig.2, and give respectively the sequences of preorder, inorder and postorder traversal of the tree shown in Fig.2. In addition, convert the forest shown in Fig.3(a) into a binary tree. Draw the forest corresponds to the binary tree shown in Fig.3(b).

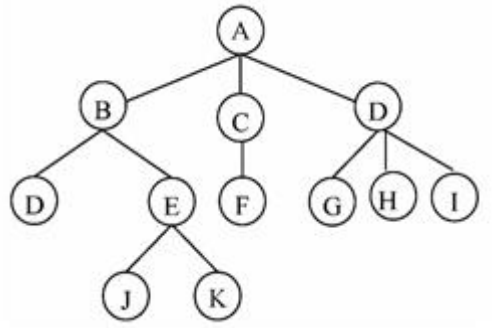
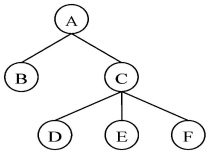
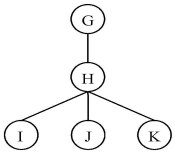


Fig.2





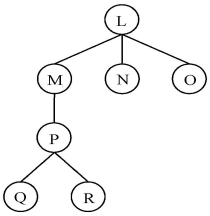


Fig.3(a)

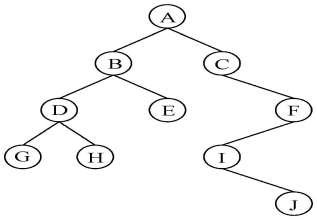


Fig.3(b)

11 (a)Given weight of 7, 18, 3, 67, 90, 32, 5, 26, 12, 8, construct the corresponding Huffman tree. (b)The sequence of inorder and postorder traversal of a binary tree are: inorder B, D, C, E, A, F, H, G, and postorder D, E, C, B, H, G, F, A. Draw the logical structure and storage structure of the binary tree.

12 Try to write a algorithm convert percentage system to five-point scale, requiring the time performance is as high as possible (i.e. the average number of comparisons is as little as possible.) Assume that the distribution of student achievement are as follows:

Score	0～59	60～69	70～79	80～89	90～100
Ratio	0.05	0.15	0.40	0.30	0.10