1. Explain the following terms: (30%)

   (a) Abstract data type
   (b) Variant record
   (c) Ordered linked list
   (d) Complete binary tree
   (e) Threaded binary tree
   (f) Heap

2. (a) Describe the differences between static and dynamic data structures. (5%)
   (b) Compared the advantages and disadvantages of static and dynamic data structures. (5%)

3. Describe three applications of stacks in computer programs. (10%)

4. Describe how to use an array to implement a circular queue. (10%)

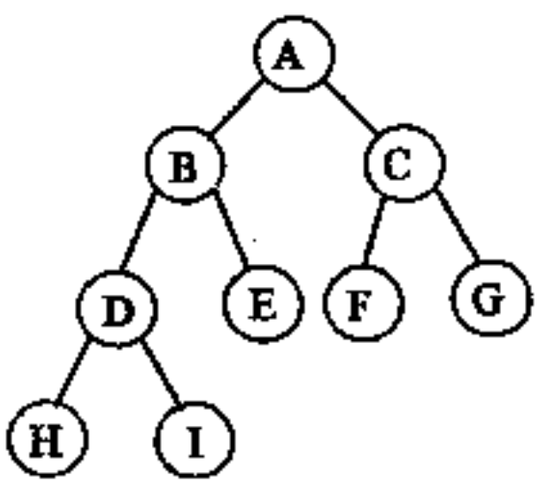
5. Compare the advantages and disadvantages of using iterations and recursive procedures. (10%)

6. Let $A[1..u_1, 1..u_2, ..., 1..u_n]$ be an n-dimensional array. If s is the address for $A[1,1,...,1]$, What is the address for $A[i_1, i_2, ..., i_n]$. Assume that the array elements are stored in row major order. (10%)

7. Convert the following expression to (a) postfix and (b) postfix forms: (8%)

   A/B-C+D*E-A*C

8. Consider the following binary tree:



Traverse the tree using (a) preorder, (b) inorder, and (c) postorder scans. (12%)