Data Structure HW4

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Q1

(A)

$log_2 1000 = 9.965...$

9.965->10

T has **10** levels

(B)

$2^9 = 512$

$2^0 + 2^1 + \ldots 2^8 = 511$

$1000 - 511 = 489$

$512 - 489 = 23$

$\lceil \frac{23}{2} \rceil + 489 = 12 + 489 = 501$

T has **501** leaf nodes

(c)

$2^7 = 128$

there **128** nodes on level 8

(D)

Node with #500 is stored in **ARRAY[500]**

(E)

List the ancestors node #256:**128,64,32,16,8,4,2,1**
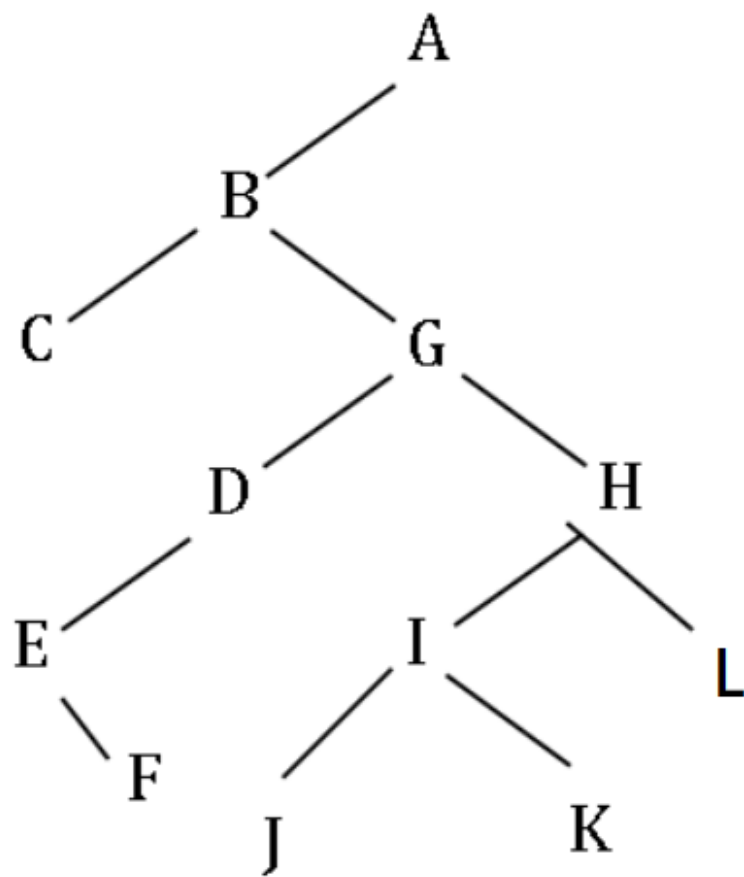
(F)

Node **78** is the parent of Node 156.

(G)

Node **761** is the right child of Node 380.

(H)

Node **512** is the leftmost node of the tree T

Q2

(A)

Preorder:ABCGDEFHIJKL

(B)

Inorder:CBEFDGJIKHLA

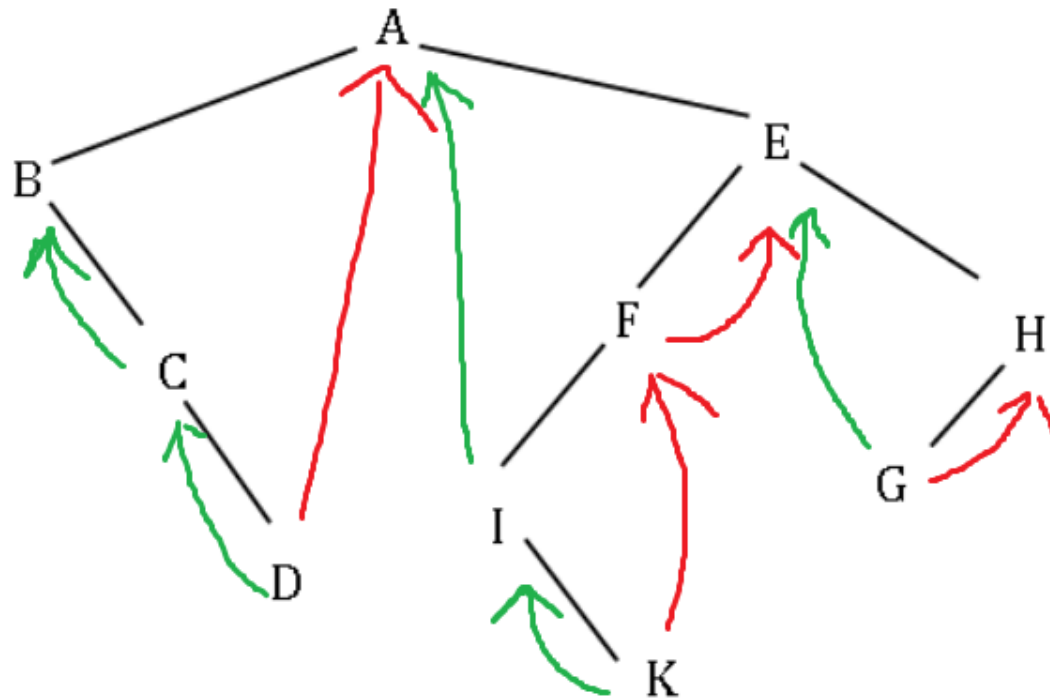**(C)**

Postorder:CFEDJKILHGBA

(D)

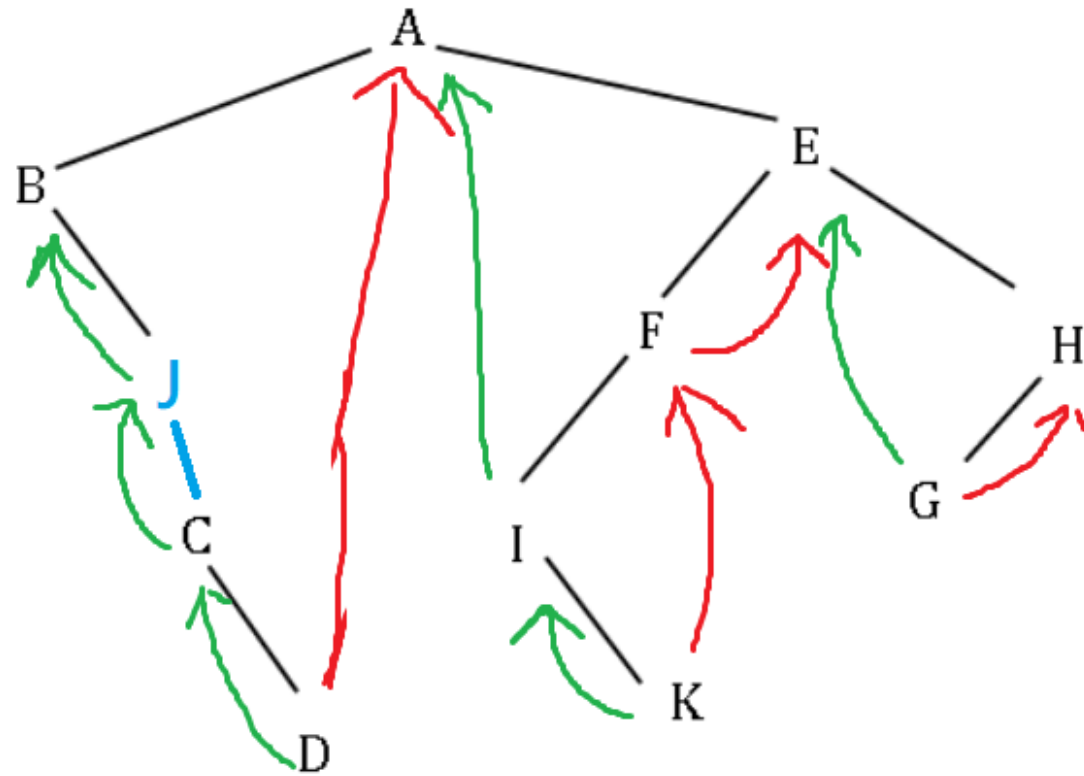Level-order:ABCGDHEILFJK

Q3

(A)

red:right child pointer
green:left child pointer

(B)

red:right child pointer

green:left child pointer

Q4

	1	2	3	4	5	6	7	8	9	10
Heap	90	89	70	36	75	63	65	21	18	15
-max	89	75	70	36	15	63	65	21	18	
+60	89	75	70	36	60	63	65	21	18	15
-max	75	60	70	36	15	63	65	21	18	
+80	80	75	70	36	60	63	65	21	18	15
-max	75	60	70	36	15	63	65	21	18	
+20	75	60	70	36	20	63	65	21	18	15