R-2.7 binary tree with n node use vector S, p be the level Algorithm root () return S. element At Rank(1) Algorithm parent (p)
return p. /2 Alggrithm leftChild (p! return 2p Algorithm night Child (p)
return 2p+1 Algorithm is Internal (p) return (2*p+1 < S. size) Algorithm is External (p)

return (2*p+1 > 5. size) Algorithm is Root (p) return p==1;

R-2.8 a, O b, Minimum number of external node for abinary tree with height h? h+1 c, Maximum number of external node for abinary tree with height h? 2h d, log(n+1)-15 h ((n-1)/2 lower bound when T is perfect binary tree upperbound when only child node has child upper bound.

Alachthan signa Kirst (a d anna Marthan) Algorithm Shuffle (S). while n>0 do i:= random In+(n) swap (S,i, n-1) Algorithm Swap (S, a, b) temp: = S. element Atrank(a) S. replace Element (p, b)
S. replace Element (b, temp) Alaparthum sides First Halper (b, 2) bund shired between som firet Helper (notinette laterth) an