A 1. Which case is most commonly used to evaluate the running time of one algorithm ( )
A Worst case B. Average — C. Best — D Ideal —

D 2. Which method is not used to resolve a recurrence ( )
A. Substitution method B. Recursion tree — C. Master — D Linear programming —

B 3. the best worst-case running time that we've seen for comparison sorting is ( )
A $O(n^2)$ B $O(n\lg n)$ C $O(n)$ D $O(\lg n)$

C 4. Inserting an element into an open-address hash table with load factor α requires at most ( ) probes on averg average, assuming uniform hashing.
A 1 B α C $1/(1-\alpha)$ D $1/(1-\alpha)^2$

A 5. An order-statistic tree is an --- size field are ( )
A $O(\lg n)$ $O(\lg n)$ $O(\lg n)$

6. Computing a discrete Fourier transform (DFT) of N points takes ( ) arithmetical operations. while computing ~~a~~ FFT of N point takes ( ) or _____
A $O(n^2)$ $O(n^2)$ B $O(n\lg n)$ $O(\lg n)$ C $O(\lg n)$ $O(n^2)$ D $O(n^2)$ $O(n\lg n)$

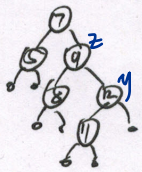
7. $T(n) = T(n/4) + T(n/2) + n^2$ recursion tree

8. COUNTING-SORT on the array $A = \langle 6, 0, 2, 0, 1, 3, 4, 6, 1, 3, 2 \rangle$
Using figure to illustrate the operation of

9. COW, DOG, SEA, RUG, ROW, RADIX-SORT

10. In order preorder post order.

11. Left Rotate



12. $X = \langle A, E, B, D, B, C, A, E \rangle$
$Y = \langle E, B, B, A, C, A, B, E \rangle$
LCS

13. Huffman tree.

a	b	e	d	e	f
15	19	6	12	13	35

14. SIMPLEX.
max: $16x_1 + 12.5x_2$
s.to: $x_1 + x_2 \le 20$
$x_1 \le 12$
$x_2 \le 16$
$x_1, x_2 \ge 0$.

15. prove n-node RB tree has height $h = O(\lg n)$

16. greedy: activity am is the first finish,
prove am is used in some maximum-size subset of mutually compatible activities of S_{ij}. ($S_{ij} = \{a_k \in S : f_i \le s_k \le f_k \le s_j\}$)

$$dp[i][j] = \begin{cases} dp[i-1][j-1]+1 & A_i = B_j \\ \max\{dp[i-1][j], dp[i][j-1]\} & A_i \ne B_j \end{cases}$$

a_m
A_k
a_j

dp[0][j] = 0

dp[i][0] = 0