CS 577 – Introduction to Algorithms

Solving Recurrences Review

Q1) Solve the following recurrences –

1. $T(n) = T(n-1) + O(1)$
2. $T(n) = T(n-1) + O(n)$
3. $T(n) = T(n/2) + O(1)$
4. $T(n) = T(n/2) + O(n)$
5. $T(n) = 2T(n/2) + O(n)$
6. $T(n) = T(n-1) + T(n-2) + O(1)$
7. $T(n) = T(n-1) + 2^n$ and $T(0) = 1$
8. $T(n) = 4T(n/2) + n^2$
9. $T(n) = T(n/3) + T(2n/3) + O(n)$
10. $T(n) = 2T(n/3) + 2T(2n/3) + O(n)$
11. $T(n) = T(n/2) + T(n/4) + T(n/8) + n$
12. $T(n) = 3T(n/2) + n$
13. $T(n) = 3T(n/4) + n^2$
14. $T(n) = 3T(n/3) + n^3$ and $T(1) = 0$

Q2) Come up with your own recurrences and try to solve them!