assume an ugly number can be stored in a word.
1. heap+hashing. $O(n \log n)$.
2. for each prime 2/3/5, maintain a pointer pointing to the ugly number which can multiply with the prime to generate the next ugly number. $O(n)$.
3. there are $O(\log^3 x)$ ugly numbers that $\leq x$, and here $n = O(\log^3 x)$. implicitly construct an $O(\log x) \times O(\log x) \times O(\log x)$ 3D sorted matrix, where entry (i, j, k) denote $2^i \cdot 3^j \cdot 5^k$. we can find the n-th ugly number in $O(n^{\frac{2}{3}} \log n)$, by finding the n-th smallest element in $O(\log x) \times O(\log x)$ sorted lists. (we can possibly remove the $\log n$ factor)
see 378. Kth Smallest Element in a Sorted Matrix and 4. Median of Two Sorted Arrays.

References