5. Let $h \in \mathsf{in}_<(I)$, since $\{g_1, \ldots, g_m\}$ is a Groebner basis for I then

$$h = q_1 \mathsf{in}_<(g_1) + \cdots + q_m \mathsf{in}_<(g_m)$$

distributing the monomials $in_<(g_i)$ in the polynomials q_i we obtain a sum of monomials such that each monomial is divisible by $in_<(g_i)$ for some i.
Now let $h \in R$ and $h = m_1 + \cdots m_k$ such that each m_i is divisible by $in_<(g_j)$ for some j. These means $h = m'_1 in_<(g_{i_1}) + \cdots + m'_k in_<(g_{i_k})$ for $i_r \in \{1, \ldots, m\}$ so $h \in \mathsf{in}_<(I)$