Let $A = (a_{k,l})_{k,l=1,\ldots,n}$ be an $n \times n$ complex matrix such that for each $m \in \{1, \ldots, n\}$ and $1 \le j_1 < \cdots < j_m \le n$ the determinant of the matrix $(a_{j_k,j_l})_{k,l=1,\ldots,m}$ is zero. Prove that $A^n = 0$ and that there exists a permutation $\sigma \in S_n$ such that the matrix

$$\left(a_{\sigma(k),\sigma(l)}\right)_{k,l=1,\ldots,n}$$

has all of its nonzero elements above the diagonal.