A covert military unit has been using a messaging system consisting of 5 tones: $A, B, C, D, E$. A miscommunication has revealed a problem. When $A$ is transmitted it can be received as $A$ or $B$, $B$ can be received as $B$ or $C$, $C$ can be received as $C$ or $D$, $D$ can be received as $D$ or $E$. $E$, however, is always received as $E$. A study of the 100 most common messages reveals that $B$ is transmitted most frequently, followed by $A$, then $D$, then $C$. $E$ is transmitted very rarely. Develop the most efficient (fewest number of tones transmitted) and unambiguous encoding for this 5-tone messaging system and explain why your system is optimal.