Let $A$ be an alphabet, and let $f$ be a function that maps each symbol in $A$ to some nonempty string. Given a string $w$ in $A^*$, we define the string $w^f$ as replacing every symbol in $w$ by its corresponding $f$ value. And we define for language $L$ the language $L^f$ as the set of all $w^f$ for $w$ in $L$.

(a) Show that if $L$ is r.e. then so is $L^f$.

(b) Show (by means of an example) that $L^f$ can be regular even if $L$ is not.