The transformation T has an eigenbasis if and only if each eigenvalue λ of T is real and satisfies $\operatorname{almu}(\lambda) = \operatorname{gemu}(\lambda)$.

Proof. ($\Longrightarrow$) Suppose T has an eigenbasis. Then $\sum_{\forall\lambda} \operatorname{gemu}(\lambda) = n$. We also know that $\operatorname{almu}(\lambda) \geq \operatorname{gemu}(\lambda)$ for all λ and $\sum_{\forall\lambda} \operatorname{gemu}(\lambda) \leq n$. Thus, $\sum\limits_{\forall\lambda} \operatorname{almu}(\lambda) = \sum\limits_{\forall\lambda} \operatorname{gemu}(\lambda) = n$. Therefore all eigenvalues are real, and it must also be that $\operatorname{almu}(\lambda) = \operatorname{gemu}(\lambda)$ for all λ.

($\Longleftarrow$) Suppose T has all real eigenvalues and $\operatorname{almu}(\lambda) = \operatorname{gemu}(\lambda)$ for all λ. Thus, $\sum\limits_{\forall\lambda} \operatorname{almu}(\lambda) = \sum\limits_{\forall\lambda} \operatorname{gemu}(\lambda) = n$. Thus, T has an eigenbasis. $\square$