Let $\mathfrak{g}$ be an affine Kac-Moody algebra, let $q$ be a complex number that is neither zero nor a root of unity, and let $\mathcal{U}_q(\mathfrak{g})$ be the quantized universal enveloping algebra of $\mathfrak{g}$. Since $\mathcal{U}_q(\mathfrak{g})$ is a Hopf algebra, the category $\mathcal{F}$ of finite-dimensional representations of $\mathcal{U}_q(\mathfrak{g})$ is a tensor category. In a previous paper [Invent. Math. 181 (2010), no. 3, 649–675; MR2660455 (2011k:17027)] the author has shown for a finite number of simple objects $S_1, \ldots, S_N$ of $\mathcal{F}$ that if the tensor product of two objects $S_i$ and $S_j$ is simple for any $i < j$, then the tensor product $S_1 \otimes \cdots \otimes S_N$ is simple.

The main result of the paper under review generalizes this result. Let $\bar{\mathfrak{g}}$ be the finite-dimensional simple complex Lie algebra from which the Kac-Moody algebra $\mathfrak{g}$ can be constructed. Then every object in $\mathcal{F}$ has a weight space decomposition with respect to the quantized universal enveloping algebra $\mathcal{U}_q(\bar{\mathfrak{g}})$. An object in $\mathcal{F}$ is called cyclic if it is generated by a highest weight vector for $\mathcal{U}_q(\bar{\mathfrak{g}})$. The author proves for a finite number of simple objects $S_1, \ldots, S_N$ of $\mathcal{F}$ that if the tensor product of two objects $S_i$ and $S_j$ is cyclic for any $i < j$, then the tensor product $S_1 \otimes \cdots \otimes S_N$ is cyclic. Besides having the earlier result as a consequence, the result has been used by Gurevich in his proof of one direction of the Gan-Gross-Prasad conjecture for $p$-adic $GL_n$. 