170. *Note on Algebras of Strongly Unbounded Representation Type. II*

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1. This paper is a continuation of our previous paper[1] on algebras of strongly unbounded representation type. Let A be an algebra over an algebraically closed field k and $g_A(d)$ be the number of inequivalent indecomposable representations of A of degree d where d is a positive integer. Then if A has indecomposable representations of arbitrary high degrees and $g_A(d)=\infty$ for an infinite number of integers d, A is said to be of *strongly unbounded representation type.*

In his paper [1], James P. Jans proved four sufficient conditions[2] for an algebra to be of strongly unbounded representation type and, in our previous paper [3], we added two conditions to them but now in this paper we shall prove another sufficient condition for an algebra to be of strongly unbounded representation type:

(7) *The graph $G(A_0)$ associated with a two sided ideal $A_0\subset N$ is*

$$\left\{P_{j_4}, P_{k_5} \,\&\, P_{j_4}, P_{k_5}, P_{k_5} \,\&\, P_{j_3}, P_{j_3}, P_{k_4} \,\&\, P_{j_3}, \begin{matrix} P_{k_4}, P_{k_4} \,\&\, P_{j_2}, \\ P_{k_3}, P_{k_3} \,\&\, P_{j_2}, \end{matrix} P_{j_2}, P_{k_2} \,\&\, P_{j_2}, P_{k_2}, P_{k_2} \,\&\, P_{j_1}, P_{j_1}, P_{k_1} \,\&\, P_{j_1}, P_{k_1}\right\}.$$ [3]

2. First of all we assume that $N^2=0$[4] and A is a basic algebra. In order to prove that this condition is sufficient for an algebra to be of strongly unbounded representation type, by the same way as [3] we construct the matrix function R_{cs}, where $c\in k$ and s is an integer,

$$R_{cs}(a)=\begin{bmatrix} X_T(a) & 0 \\ Y(a) & X_B(a)\end{bmatrix},$$

as follows:

Let $X_T(a)$ be the direct sum of $I_{2s}*X_{j_4}(a)$, $I_{6s}*X_{j_3}(a)$, $I_{11s}*X_{j_2}(a)$ and $I_{5s}*X_{j_1}(a)$ and let $X_B(a)$ be the direct sum of $I_{4s}*X_{k_5}(a)$, $I_{9s}*X_{k_4}(a)$, $I_{5s}*X_{k_3}(a)$, $I_{8s}*X_{k_2}(a)$ and $I_{2s}*X_{k_1}(a)$ where $X_{j_p}(a)$ and $X_{k_q}(a)$ are obtained by the same way as [1] or [3].

Next we put

1) T. Yoshii [3].
2) James P. Jans [1] or T. Yoshii [3].
3) From now on we use same notations as [1] or [3].
4) James P. Jans [1] for the case where $N^2\neq 0$.