175. On the Sets of Points in the Ranked Space. II

By Hidetake NAGASHIMA,*) Kin'ichi YAJIMA,**) and Yukio SAKAMOTO***)

(Comm. by Kinjirô KUNUGI, M. J. A., Oct. 12, 1968)

In the preceding papers [3], [4], we defined the notions with respect to sets of points, m-open, m-closed, m-accumulation point, m-ω-accumulation point, m-cluster point, in the ranked space [1], [2]. And, we mentioned some propositions in respect of these notions. However, in these propositions, we assumed that a ranked space satisfies Condition (M).

Now, we find that all of these propositions hold in the ranked space which does not satisfy Condition (M), if we use new notions derived by another definition of an open set.

1. Definition 1. A subset A in a ranked space is r-open if and only if for any point p belonging to A and for any fundamental sequence of neighborhoods of p, $\{V_\alpha(p)\}$, there is some member $V_{\alpha_0}(p)$ of $\{V_\alpha(p)\}$ such that $V_{\alpha_0}(p)\subseteq A$.

A subset B in a ranked space is r-closed if and only if the complementary set of B, $R-B$, is r-open.

Definition 2. In a ranked space R, a point p is an r-accumulation point of a subset A if and only if there is some fundamental sequence of neighborhoods of p, $\{V_\alpha(p)\}$, such that $V_\alpha(p)\cap(A-\{p\})\neq\phi$ for all α.

Proposition 1. *If R is a ranked space, then the following conditions are equivalent.*

(a) *A subset A of R is r-closed.*

(b) *A subset A of R contains the set consisting of its r-accumulation points.*

Proof. We can prove this proposition as well as the proposition in the preceding paper [3].

Proposition 2. *If R is a ranked space, then the following conditions are equivalent.*

(a) *A point p is an r-accumulation point of a subset A of R.*

(b) *There is a sequence in $A-\{p\}$ which R-converges to p.*

Proof. To prove that (a) implies (b).

---

*) Hokkaido University of Education.

**) Japanese National Railways.

***) Japan Women's University.