Chapter 4

Conclusions and Open Problems

4.1 Conclusions

In this thesis, we obtain the following results. We prove the characterization of CI-graphs on Cayley digraphs of left groups. We also investigate the necessary and sufficient conditions for Cayley digraphs of right groups with given connection sets to be CI-graphs.

(1) Let $S = G \times L_n$ be a left group and $A \subseteq S$. Then $\mathrm{Cay}(S, A)$ is a CI-graph if and only if $n = 1$ and $\mathrm{Cay}(G, p_1(A))$ is a CI-graph.

(2) We introduce about being CI-graphs of any right groups with a one-element connection set. Let $S = G \times R_n$ be a right group where G is a cyclic group and R_n is an n-element right zero semigroup. Let $(a, r_i) \in S$ where $i \in \{1, 2, ..., n\}$. Then $\mathrm{Cay}(S, \{(a, r_i)\})$ is a CI-graph since G is a 2-DCI-group.

(3) Let $S = G \times R_n$ be a right group and $A \subseteq G \times \{r_i\}$ where $i \in \{1, 2, ..., n\}$. Then $\mathrm{Cay}(S, A)$ is a CI-graph if and only if $\mathrm{Cay}(G, p_1(A))$ is a CI-graph.

4.2 Open problems

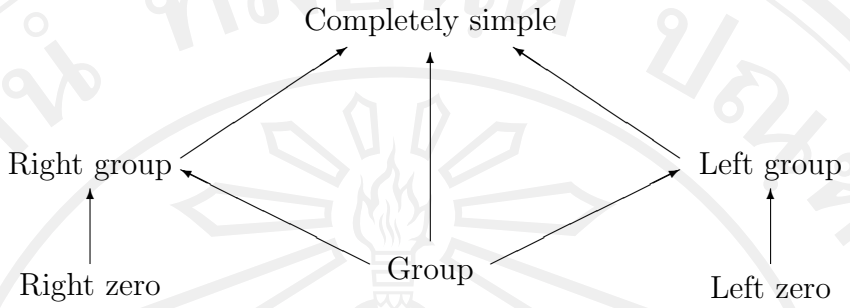

Figure 4.

Figure 4. shows the implications between a completely simple semigroup, right (left) group, right (left) zero semigroup, and group. An arrow from one property to another one indicates that the former implies the latter. Therefore, we suggest the following open problems to be research works in the future.

(1) What are the conditions of being a CI-graph of a right group S and arbitrary connection sets $A \subseteq S$?

(2) What are the conditions of being a CI-graph of a rectangular group?

(3) What are the conditions of being a CI-graph of a completely simple semigroup?