5.1 Consider the following P/T-net:

\[
\begin{align*}
&\text{w}_1 \rightarrow \text{w}_2 \rightarrow \text{r}_2 \rightarrow \text{r}_1 \\
&\text{processing} \rightarrow \text{w}_3 \rightarrow \text{w}_4 \rightarrow \text{writing} \rightarrow \text{r}_2 \rightarrow \text{reading} \rightarrow \text{r}_3 \rightarrow \text{processing}
\end{align*}
\]

a) Introduce minimal capacities which do not affect the behaviour of the net.
b) Construct the matrix of this net.

5.2 Construct different coverability graphs for the following P/T-net:

\[
\begin{align*}
&\text{s}_1 \rightarrow \text{s}_2 \rightarrow \text{s}_3 \\
&\text{a} \rightarrow \text{b} \rightarrow \text{c} \rightarrow \text{d} \rightarrow \text{e} \rightarrow \text{f}
\end{align*}
\]

5.4 Construct three different P/T-nets with equal coverability graphs.

5.5 Show that in the P/T-net of the exercise 5.2

a) \( \exists M' \in [M_N] \) with \( (0, 5, 10) < M' \),
b) \( \exists M' \in [M_N] \) with \( (1, 2, 3) < M' \),
c) \( \{s_2, s_3\} \) is simultaneously unbounded,
d) there exists no \( M_N \)-dead transitions.

5.6 Consider the following P/T-net:

\[
\begin{align*}
&s_1 \rightarrow s_2 \rightarrow s_3 \\
&t_1 \rightarrow t_2 \rightarrow t_3 \rightarrow t_4
\end{align*}
\]

a) Which subsets of places are simultaneously unbounded?
b) Is the net live?

5.7 Is the net in Exercise 5.2 live?