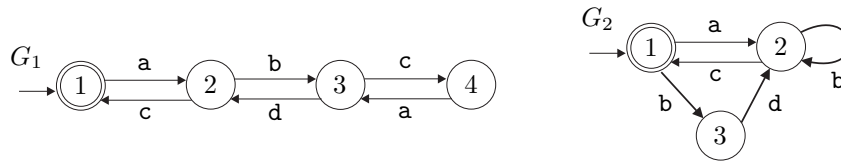


Exercise Sheet 1: Automata and Formal Languages**Problem 1:**

The following automata are given. Determine regular expressions for their marked languages.

**Problem 2:**

The following languages are given in the form of regular expressions.

- $L_1 = (a + b)c^* + c(a + b)^*$.
- $L_2 = \epsilon + (a(abc)^*b)^*$.

Determine automata that recognize these languages.

Problem 3:

Consider the following languages.

- $L_1 = \{\text{set of all strings in } \{a, b\}^*, \text{ that terminate with at least two successive events } b\}$
- $L_2 = \{ww \mid w \in \{a, b\}^*\}$

- a. Determine the pumping length of L_1
- b. Write down three example strings in L_2
- c. Show that L_2 is not regular.