

CSE-217: Theory of Computation

Class Test - 01

Time: 30 minutes

Full marks: 20

[Instruction: All the questions carry equal weights.]

1. Each of the following languages is the complement of a simpler language. In each part, construct a DFA for the simpler language, and then use it to give the state diagram of a DFA for the language given. In all parts, $\Sigma = \{a, b\}$.

(a) $\{w \mid w \text{ contains neither the substrings } ab \text{ nor } ba\}$

(b) $\{w \mid \text{the length of } w \text{ is at most } 5\}$

2. Consider the following DFA:

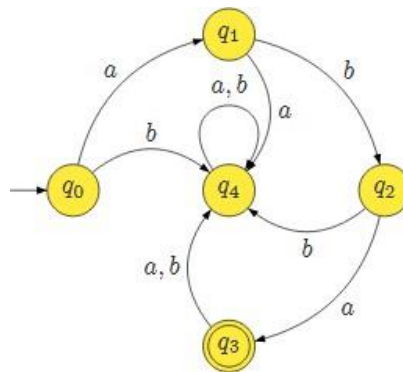


Figure 1: DFA M

- Write down the formal definition of machine M.
- Write the traces (computations) in M for the following strings: ab- bab, ab, ϵ . Which of these strings are accepted by M? Justify your answers.
- What is the language accepted by M? Justify your answer.