Instructions: Solve all questions. Show your work where applicable.

Question 1 (2 marks)

Construct a DFA that accepts all strings from the language L = {strings of size not divisible by 3}. Draw the state diagram and provide the transition table.

Question 2 (2 marks)

Given the following DFA, determine whether the strings "1011" and "1010" are accepted or rejected. Show the path of computation for each string.

State diagram:

- States: $\{q_0, q_1, q_2\}$ Initial state: q_0 Final state: q_2

- Transitions:

    o $\delta(q_0, 0) = q_0, \delta(q_0, 1) = q_1$

    o $\delta(q_1, 0) = q_2, \delta(q_1, 1) = q_0$

    o $\delta(q_2, 0) = q_2, \delta(q_2, 1) = q_2$

Question 3 (1 mark)

How many states can the equivalent DFA have in the worst case if the original NFA has N states?

Question 5

Find the minimum automata: (Use Table Filling / Equivalence method)

State / Σ	0	1
→ q0	q1	q2
q1	q3	q4
q2	q5	q6
q3	q3	q4
q4	q5	q6
*q5	q3	q4
q6	q5	q6