(b)

Let L be the language of the DFA above. How many equivalence classes does $\sim_L$ have? Justify your answer.

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from proposition 62 of the book:
Suppose M is a DFA whose language is L. if x and y end at the same state of M, then $x \sim_L y$.
In the above DFA, $\{q_0\}$ and $\{q_0, q_1\}$ end in the same states of N so $\{q_0\} \sim_L \{q_0, q_1\}$. The other states have unique output sets so are in their own equivalence classes.
$\therefore$ the number of equivalence classes in $\sim_L$ is 3.