(b)

Construct a DFA recognising the following language:

$$L = \{w \in \Sigma^* | \text{ every odd position of } w \text{ is } 1\}$$

Justification not required.

Let DFA M recognise $L = L(M)$, M has:

- states $Q = \{q_0, q_1, q_2, q_3\}$
- start state $q_0 \in Q$
- accept states $A = \{q_0, q_1, q_2\}$ and,
- transition function δ :

Input State	Letter	Output State
q_0	1	q_1
q_0	$a \in \Sigma, a \neq 1$	q_3
q_1	$a \in \Sigma$	q_2
q_2	1	q_1
q_2	$a \in \Sigma, a \neq 1$	q_3
q_3	$a \in \Sigma$	q_3