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The alphabet $\sum$ is given by $\{0, 1\}$

(a)

The context free grammar that generates the language

$\{\omega \mid \omega \text{contains at least three 1s}\}$ is given by

$S \to P1P1P1P$
$P \to 0P \mid 1P \mid \varepsilon$

(b)

The context free grammar that generates the language $\{\omega \mid \omega \text{starts and ends with the same symbol}\}$ is given by

$S \to 0P0 \mid 1P1 \mid 0 \mid 1$
$P \to 0P \mid 1P \mid \varepsilon$

(c)

The context free grammar that generates the language

$\{\omega \mid \text{the length of } \omega \text{is odd}\}$ is given by

$S \to 0 \mid 1 \mid 00S \mid 01S \mid 10S \mid 11S$
(or)
$S \to 0 \mid 1 \mid 0S0 \mid 0S1 \mid 1S0 \mid 1S1$

(d)

The context free grammar that generates the language $\{\omega \mid \text{the length of } \omega \text{is odd and its middle symbol is a 0}\}$ is given by

$S \to 0 \mid 0S0 \mid 0S1 \mid 1S0 \mid 1S1$

(e)

The context free grammar that generates the language $\{\omega \mid \omega = \omega^R, \text{that is, } \omega \text{is a palindrome}\}$ is given by

$S \to 0 \mid 1 \mid 0S0 \mid 1S1 \mid \varepsilon$

(f)

The context free grammar that generates the language

$\{\ \}$ is given by

$S \to S$