

PS04-04

January 28, 2018

a. $\{a^n b^{2n} c^k : n, k \geq 1\}$

$$\begin{aligned} S &\rightarrow NC \\ C &\rightarrow Cc \mid c \\ N &\rightarrow abb \mid aNbb \end{aligned}$$

b. $\{a^n b^k a^n : n, k \geq 1\}$

$$\begin{aligned} S &\rightarrow aSA \mid aBA \\ A &\rightarrow a \\ B &\rightarrow b \mid bB \end{aligned}$$

c. a

d. $\{a, b\}^* - \{palindromes\}$

$$\begin{aligned} S &\rightarrow XSX \mid N \\ N &\rightarrow aRb \mid bRa \\ R &\rightarrow XRX \mid X \mid \varepsilon \\ X &\rightarrow a \mid b \end{aligned}$$