

Tarea 18

1. Encuentre una gramática que genere cada uno de los siguientes lenguajes:

$$a) L = \{ a^n b c^{n+1} \mid n \geq 0 \} \quad S \rightarrow aSb \quad a^n b^n$$

$$S \rightarrow aSc \mid bc$$

$$b) L = \{ a^m b^n \mid m \geq n \geq 0 \}$$

$$S \rightarrow aSb \mid a$$

$$c) L = \{ a^{n+2} b^n \mid n \geq 0 \}$$

$$S \rightarrow aaA \mid a \quad S \rightarrow aAb \mid aa$$

$$A \rightarrow aAb \mid \epsilon$$

$$d) L = \{ a^{2n} b c^n \mid n \geq 0 \}$$

$$S \rightarrow aaSc \mid b$$

$$e) L = \{ a^n b^m c^{n+m} \mid n \geq 0 \text{ y } m \geq 0 \}$$

$$S \rightarrow aSc \mid A$$

$$A \rightarrow bSc \mid \epsilon$$

$$f) L = \{ a^n b^m c^m a^n \mid n \geq 0 \text{ y } m \geq 0 \}$$

$$S \rightarrow aSa \mid A$$

$$A \rightarrow bAc \mid \epsilon$$

$$g) L = \{a^n b^n c^m d^m \mid n \geq 0 \text{ y } m \geq 0\}$$

$$S \rightarrow AB$$

$$A \rightarrow aAb \mid \epsilon$$

$$B \rightarrow cBd \mid \epsilon$$

$$h) L = \{a^n b^{n+m} c^m \mid n \geq 0 \text{ y } m \geq 0\}$$

$$S \rightarrow AB$$

$$A \rightarrow aAb \mid \epsilon$$

$$B \rightarrow bBc \mid \epsilon$$

$$i) L = \{a^m b^n \mid m \neq n\}$$

$$S \rightarrow AB$$

$$A \rightarrow$$

$$j) L = \{a^n b^n \mid 0 \leq n \leq m \leq 2n\}$$

$$S \rightarrow AB$$

$$A \rightarrow aA \mid a$$

$$B \rightarrow bB \mid \epsilon$$

$$k) L = \{a^n b^{n+m} c^{2n} \mid m \geq 0, n \geq 0\}$$

$$S \rightarrow AB$$

$$A \rightarrow aAb \mid \epsilon$$

$$B \rightarrow bBcc \mid \epsilon$$

$$l) L = \{a^m b^n c^p \mid n \geq m + p \text{ y } p \leq n - m\}$$

$$S \rightarrow ABC$$

$$A \rightarrow aAb \mid \epsilon$$

$$B \rightarrow bB \mid \epsilon$$

$$C \rightarrow bCc \mid \epsilon$$

$$m) L = \{w \in \{a,b\}^* \mid w = w^R\}$$

\rightarrow bsb | a s a | a | b | ϵ