

1. Propose a grammar that would accept any word (English word). Use Greek letters to represent groups of characters making sure that you have a table that describes their meaning.

OR

Strings over $\{a, b, c, d\}$ whose language is $\{a^n b^2 n c^m d^2 m \mid n, m \geq 0\}$

$S \rightarrow A$

$A \rightarrow a \mid A B \mid (\text{empty})$

$B \rightarrow bb \mid B C \mid (\text{empty})$

$C \rightarrow c \mid C D \mid (\text{empty})$

$D \rightarrow dd \mid (\text{empty})$

2. Derive the expression tree for $(n + (n + (n + n)))$, given the following grammar:

$E \rightarrow T$

$E \rightarrow (E + E)$

$T \rightarrow n$

