

The point values are to the left of the problem number.

(1)1. Describe the language $L(G)$ for the following grammar.

$G = (V, V_T, S, P)$ where $V = \{S, A, 0, 1\}$, $V_T = \{0, 1\}$, and P consists of

$S \rightarrow S0$

$S \rightarrow A1$

$A \rightarrow 0A$

$A \rightarrow 0$

(2)2. Write the productions of #1 in BNF.

(2)3. Give the productions for a grammar that generates the following language.

$00(11)^*01$

(1)4. Classify the following grammar using the Chomsky hierarchy.

$G = (V, V_T, S, P)$ where $V = \{S, A, 0, 1\}$, $V_T = \{0, 1\}$, and P consists of

$S \rightarrow A0$

$S \rightarrow \lambda$

$A \rightarrow 0A$

$A \rightarrow 1$

(1)5. Derive the following word using the grammar of #4.

00010

(1)6. Use a parse tree to derive the word in #5.

(2)7. Write the Chomsky hierarchy of grammars including the machines that recognize the associated languages.