Context-Free grammars. Variant 1.

1. Develop a context-free grammar for balanced strings of (), [], {}. Write down derivations and parse trees for the strings ([]){}, [({})].
2. Develop a context-free grammar for the language $\{0^n10^n, n>0\}$. Write down derivations and parse trees for the strings 00100, 00010.

Context-Free grammars. Variant 2.

1. Develop a context-free grammar for superposition of functions M(X,Y,…) – maximum of arguments, m(X,Y,…) – minimum of arguments. Write down derivations and parse trees for the strings M(X,m(A,B),C), M((A,m(B,C),X).
2. Develop a context-free grammar for the language {wu: $w \in \{0,1\}^*$, "u" is "w" written from the right to the left and inverted}. Write down derivations and parse trees for the strings 0101, 01010.

Context-Free grammars. Variant 3.

1. Develop a context-free grammar for regular expressions with the alphabet X={0,1}. Write down derivations and parse trees for the strings (0+10*)*(1+11), 00+(1*+0+).
2. Develop a context-free grammar for the language $\{0^n10^m; n,m>0, n<m\}$. Write down derivations and parse trees for the strings 0100, 00100.