Ch2—exercises

Please construct context-free grammars **without ε-productions** from the following languages (10%).

a) {ω| ω∈(a,b,c)* and the numbers of a's and b's and c's occurred in ω are **even**}

b) {$a^ib^j$|**i≥(2j+1)** and j≥0}

c) {ω| ω∈(a,b,c)* and the numbers of a's and b's occurred in ω are **odd**}

d) {$a^ib^j$|**i≥(j+1)** and j≥0}

e) {ω| ω∈(a,b,c)* , ω is **lead by a** and the numbers of a's and b's occurred in ω are **even** }

f) {$a^{2i}b^{2j}$|**j≥i≥1**}

g) {ω| ω∈(a,b,c)* and ω **starts with a and ends with b**, **the numbers of a's and c's occurred in ω** are **even**}

h) {$a^ib^jc^k$|**j≥(i+k+1)** and **i≥0, k≥1**}

j) {ω| ω∈(a,b,c)* and ω starts with a or b, ends with c, and the numbers of a's and b's and c's occurred in ω are **even**}

k) $a^{2i-1}b^{2j-1}c^{2k-1}$ $(i\geq 1, j\geq i+k, k\geq 1)$