For each language list and derive 5 valid strings and two invalid strings

1. Find a regular grammar that generates the language L (aa^* (ab^+ a)*).

2. Construct right- and left-linear grammars for the language

$$L = \{a^n b^m : n \geq 2, m \geq 3\}.$$

3. Construct a right-linear grammar for the language L ((aab^*ab)*).

4. Find regular grammars for the following languages on { a, b}.

(a) $L = \{w : n_a(w)$ and $n_b(w)$ are both even$\}$.
(b) $L = \{w : (n_a(w) - n_b(w)) \bmod 3 = 1\}$.
(c) $L = \{w : (n_a(w) - n_b(w)) \bmod 3 \neq 1\}$.
(d) $L = \{w : (n_a(w) - n_b(w)) \bmod 3 \neq 0\}$.
(e) $L = \{w : |n_a(w) - n_b(w)|$ is odd$\}$.

5. Construct right linear and left linear grammar for the regular expression

a) $(000^* + 111^*)^*$

b) $(01 + 10)(01 + 10)(01 + 10)$

c) $(0 + 1(01^*0)^*1)^*$

d) $bba(ab)^* + (ab + ba^*b)^*ba$