1. Ex. 1: Give a context-free grammar to generate the following language $\mathcal{L}$:

$$\mathcal{L} = \{ w \in \{0,1\}^* \mid w \text{ contains at least four } 1 \}$$

2. Ex. 2: Give a context-free grammar to generate the following language $\mathcal{L}$:

$$\mathcal{L} = \{ w \in \{0,1\}^* \mid w = \text{reverse}(w) \wedge |w| \text{ is odd} \}$$

3. Ex. 3: Give a context-free grammar to generate the following language $\mathcal{L}$:

$$\mathcal{L} = \{ w \in \{0,1\}^* \mid w = \text{reverse}(w) \}$$

4. Ex. 4: Give a context-free grammar to generate the following language $\mathcal{L}$:

$$\mathcal{L} = \{ a^i b^j c^k \mid i,j,k \in \mathbb{N} \wedge i + j = k \}$$

5. Ex. 5: Give a context-free grammar to generate the following language $\mathcal{L}$:

$$\mathcal{L} = \{ 0^n 1^n \mid n \in \mathbb{N} \} \cup \{ 0^n 1^{2n} \mid n \in \mathbb{N} \}$$