

TEST 3, FALL 2025

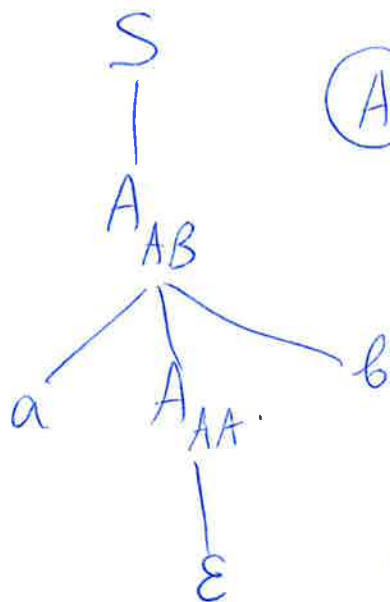
SOLUTIONS TO PROBLEMS 1-2

①

$$\begin{array}{r} 1 - (1 - 2) \\ \hline 1 \quad 1 \quad 2 - - \\ \hline - \quad - \quad - \quad - \\ - \quad - \quad - \quad - \\ - \quad - \quad - \quad - \end{array}$$

$$\begin{array}{r} 1 \quad 1 \quad 2 \quad - \quad - \\ \hline 1 \quad 1 \quad \textcircled{2} \quad \textcircled{-1} \quad 2 \\ \quad \quad 1 \quad \textcircled{1} \quad \textcircled{1} \\ \quad \quad \quad 1 \end{array}$$

②



$$\textcircled{A} \xrightarrow{a, \epsilon \rightarrow b} \textcircled{A}$$

$$\textcircled{A} \xrightarrow{b, b \rightarrow \epsilon} \textcircled{B}$$

$$A_{AB} \rightarrow aA_{AA}b$$

General:

$$\textcircled{p} \xrightarrow{a, \epsilon \rightarrow t} \textcircled{q}$$

$$A_{ps} \rightarrow aA_{qt}b$$

$$\textcircled{\Gamma} \xrightarrow{b, t \rightarrow \epsilon} \textcircled{S}$$