Nama . M. Dafta Rizky Sutrisno
NRP : 5025231207

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1) $S \rightarrow xbaax \mid ax$
$x \rightarrow xa \mid xb \mid \varepsilon$
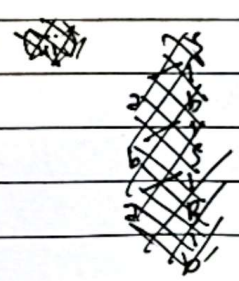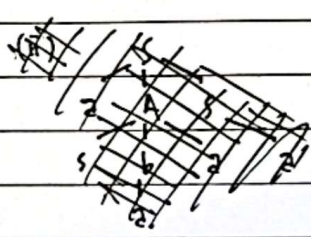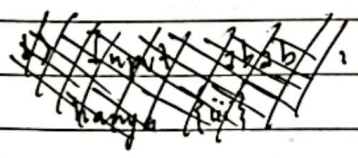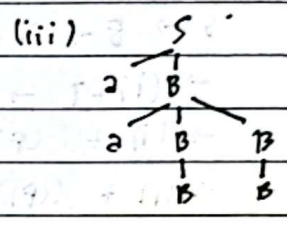
a. Leftmost Derivation
$S \rightarrow xbaax \rightarrow xabaax \rightarrow \varepsilon abaax \rightarrow \varepsilon aba a\varepsilon$
string : $\varepsilon aba'\varepsilon$
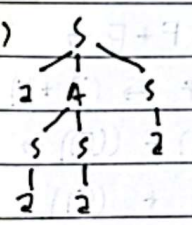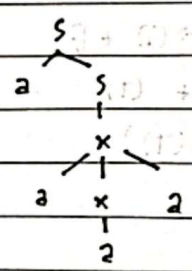
b. Rightmost Derivation
$S \rightarrow xbaax \rightarrow xbaaxb \rightarrow xbaa\varepsilon b \rightarrow \varepsilon baa\varepsilon b$
string : $\varepsilon ba'\varepsilon b$
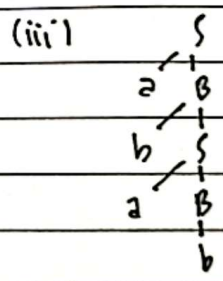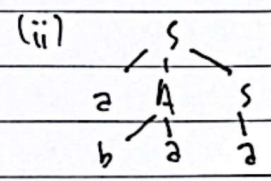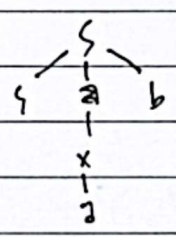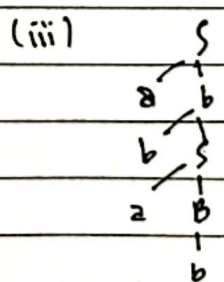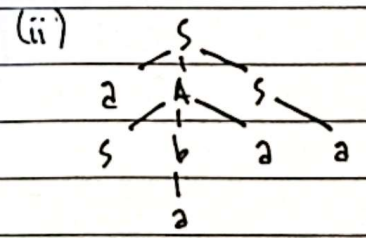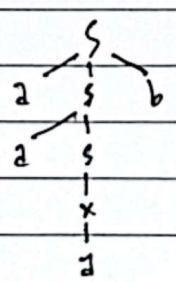
2) a) Input aaa :
hanya {i, ii}

b) Input abaa :
hanya {ii}

c) Input abab :
hanya {iii}

3) a. $((i)^* (i+i)) + i$

$S \to E \to T + E \to F+E \to (E) + E \to (T) + E$
$\to (F^*T) + E \to ((E)^* T) + E \to ((i)^* T) + E$
$\to ((i)^* F) + E \to ((i)^* (E)) + E \to ((i)^* (T+E)) + E$
$\to ((i)^* (F +E)) + E \to ((i)^* (i + E)) + E \to ((i)^* (i +T)) + E$
$\to ((i)^* (i+F)) + E \to ((i)^* (i+i)) + E \to ((i)^* (i+i) + T$
$\to ((i)^* (i+i)) + F \to ((i)^* (i+i)) + i$

b. $(i) + ((i))$

$S \to E \to T + E \to F + E \to (E) + E \to (i) + E$
$\to (i) + T \to (i) + F \to (i) + (E) \to (i) + (T)$
$\to (i) + (F) \to (i) + ((E)) \to (i) \to ((T))$
$\to (i) + ((F)) \to (i) + ((i))$