Compiler Construction

Construct the characteristic finite state machine for the following grammar.

\[
\begin{align*}
S & \rightarrow A \; B \; \text{eof} \\
A & \rightarrow A \; B \; | \; B \; a \\
B & \rightarrow (A) \; | \; b
\end{align*}
\]

[6 marks]

Explain what is meant by the FOLLOW set for a non-terminal symbol in a grammar, and derive the FOLLOW sets for \( A \) and \( B \) in the above grammar.

[4 marks]

Construct, with explanation, the SLR(1) action and goto matrices for the above grammar.

[5 marks]

Illustrate how the SLR(1) parsing algorithm works for this grammar by showing the successive states of the parser stack and input stream while parsing

\[
\text{b a b ( b a ) eof}
\]

[5 marks]