Instructions: Total 10 marks. Closed Book. Answer all questions in the space provided.

1. (4 Marks) Give a brief (one sentence) definition for each of the following terms.

   a. $L(G)$ (the language generated by a grammar G)

   b. ambiguous grammar
2. Consider the following BNF grammar G:

1. \( S \rightarrow (A) \)
2. \( S \rightarrow S \)
3. \( A \rightarrow a b \)
4. \( A \rightarrow b a \)
5. \( A \rightarrow A A \)

2.a. (3 marks) Show the parse tree according to G for the input string:

\((a b b a a b) (b a)\)

2.b. (3 marks) Give an ordered list of the productions (i.e. matched handles) that would be used in a bottom up left-to-right shift-reduce parse of the same input string \((a b b a a b) (b a)\). Use the production numbers shown on the left of the grammar given above to refer to the productions (i.e., your answer will be a list of production numbers in the order that the productions would be used in a bottom-up left-right shift-reduce parse of the input string).