1 (a). Yes/Tr $S \to a \mid b$ $S \to T \mid b$
                                         $T \to a$.

(b).   Yes/Tr

Assume grammar is unambiguous but
the language of the grammar is ambiguous
Grammar is unambiguous $\Rightarrow$ every sentence
                              generated by grammar has
              unique parse tree
                    $\Rightarrow$ semantics of sentence is
                              unambiguous
                    $\Rightarrow$ language is unambiguous
                              [Contradiction]

(c). No/Fa.
Expression language discussed in class.

(d) No/Fa.   aba is a palindrome -
               not generated by the grammar

(e) Yes/Tr.   ++ has higher precedence than
                        + and *
               * has higher precedence than
                        +.

2. G1 and G3 generates all palindromes

   G2 generates all strings over a & b.

   G2 > G1

   G2 > G3

   G1 and G3 are equivalent.

3.

(a) Yes.   1 + 2 + 3 has two different
                        parse trees (from class)

(b).   − , * has higher prec. than +, /

   / is left, − is left, * is left.

4.(a) Yes. − The program contains a block
                        w/ begin & end
         − Each statement is labeled
         − Arith expression follows the grammar
                                              rule
         − conditional expression follows rule
                        the grammar rule

         − Assignment & if... then follow
                                        rules

   (b). No. − label allowed only one time (first
                                                stmt)

         − begin... end block may contain
                one statement