```
Num   ::= [0-9]+
Id    ::= [a-zA-Z] [a-zA-Z0-9]*
Str   ::= ' " `[^"]* '"`
```

Answers

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Question 1 (Grammar):

```
Prg    ::= Stmts
Block  ::= "{" Stmts "}" | Stmt
Stmts  ::= Stmt ";" Stmts | Stmt
Stmt   ::= "skip" | Id ":=" AExp
           | "write" "(" Id ")" | "write" "(" Str ")"
           | "write" Id | "write" Str | "read" Id
           | "if" BExp "then" Block "else" Block
           | "if" "(" BExp ")" "{" Block "}" "else"
           "{" Block "}" | "while BExp "do"
           Block | "while" "(" BExp ")" Block
```

```
AExp ::= T "+" AExp
       | T "-" AExp
       | T

T ::= F "*" T
    | F "/" T
    | F "%" T
    | F

F ::= "(" AExp ")"
    | Id | Num
```

```
BExp ::= BExpA "||" BExp | BExpA
BExpA ::= BExpC "&&" BExpA | BExpC
BExpC ::= AExp "==" AExp
        | AExp "!=" AExp
        | AExp "<" AExp
        | AExp ">" AExp
        | AExp "<=" AExp
        | AExp "=>" AExp | BExpT
BExpT ::= "true" | "false"
        | "(" BExp ")"
```
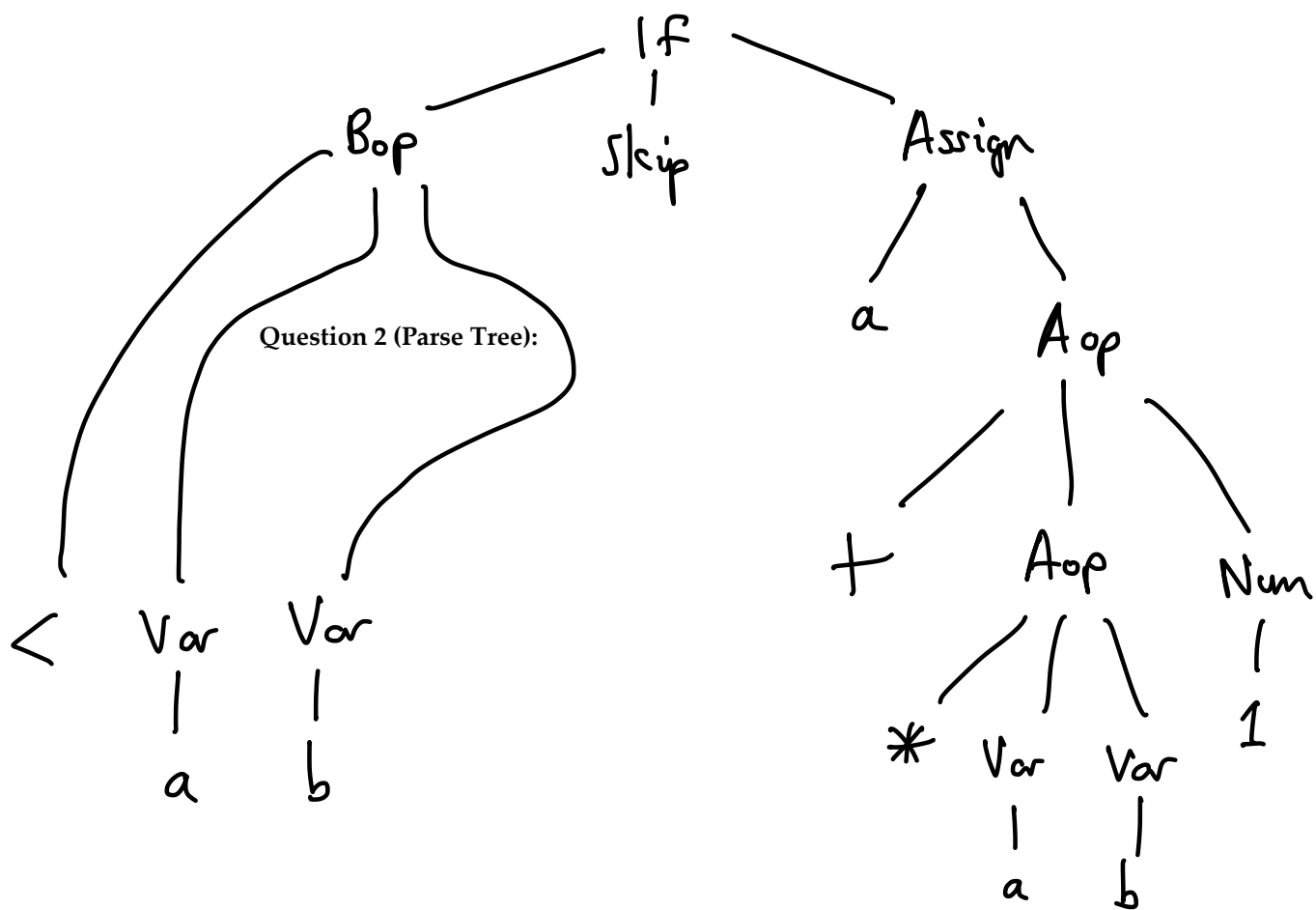
Question 2 (Parse Tree):

If
Bop
Skip
Assign
a
Aop
<
Var
Var
a
b
+
Aop
Num
Aop
1
*
Var
Var
a
b

Question 3 (Timings):

n	secs
100	0.1
500	7.4
700	17.1
1000	58.6
1500	200.2
2000	330.4