# Quiz 5

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. (40) Give the parse tree for the following grammar that yields **w=x+y\*z^2-16**. **A** is the start symbol.

**A->I = E**



**E->E+T | E-T | T**

**T-> T\*F | T/F | F**



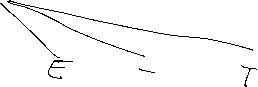
**F->P^F | P**



**P->(E) | I | Ds**

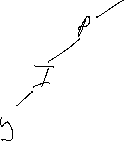
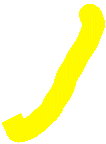
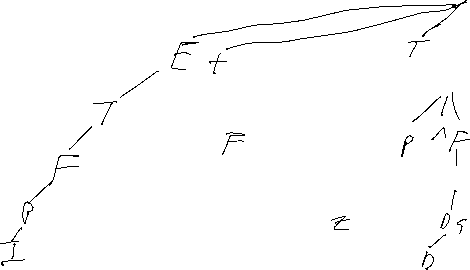
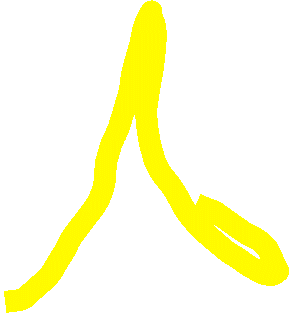
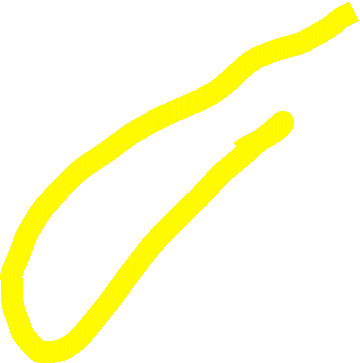


**I->w|x|y|z**



**Ds->D Ds | D**

**D->0 | 1 | … | 9**



1. (30) Draw a line for each EBNF pattern on the left to each string on the right that could have come from that pattern. Note that I am using non-terminals, here.

**EBNF String (of non-terminals)**

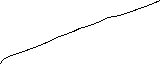
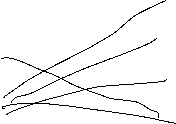
CBC



C ( A | B ) [A] C

BBB

C [ A | B ] {A|C}



BAB

{ B| A } {C | B}

CC

1. (20) Give the EBNF for all strings containing characters **a,b**,**c** that contain at least one **a** (and may have 0 or more of **b** or **c**).

