**CSCI 204 In-Class Activity**

**Evaluate Postfix Expressions**

**solution**

1. Assume the variables have the given values. Manually evaluate the following postfix expressions. Write in each step the result of partial evaluation. Any division operations are assumed to be integer division, i.e., the result is a truncated integer, e.g., 17/10 results in 1 (one).

A = 3, B = 10, C = 4, D = 5.

1. B A + C D \* +
2. B A \* C D \* A – +
3. B D / A B \* B C D + + \* +

 B A + C D \* + ==> 10 3 + 4 5 \* + ==> 13 4 5 \* + ==> 13 20 + = 33

 B A \* C D \* A - + ==> 10 3 \* 4 5 \* 3 - +==> 30 20 3 - + ==> 30 17 + = 47

 B D / A B \* B C D + + \* + ==> 10 5 / 3 10 \* 10 4 5 + + \* + ==> 2 30 10 4 5 + + \* + ==> 2 30 10 9 + \* + ==> 2 30 19 \* + ==> 2 570 + = 572

1. Manually convert the following infix expressions into postfix ones. Note: you need to “fully parenthesize” the expressions first before converting.
2. (A + B) \* (C – D)
3. A + B \* C – D
4. A \* B + C \* D – F
5. A \* (B + C) – C \* D

(A + B) \* (C – D) ==> ((A + B) \* (C – D)) ==> ((A B +) \* (C D -)) ==> ((A B +) (C D -) \*) ==> A B + C D - \*

A + B \* C – D ==> (((A + (B \* C)) – D)) ==> (((A + (B C \*)) – D)) ==> (((A (B C \*) +) – D)) ==> (((A (B C \*) +) D -)) ==>A B C \* + D –

A \* B + C \* D – F ==> (((A \* B) + (C \* D)) – F) ==> (((A B \*) + (C D \*)) – F) ==> (((A B \*) (C D \*) + ) F -) ==> A B \* C D \* + F –

A \* (B + C) – C \* D ==> ((A\*(B + C) – (C \* D))) ==> ((A \* (B C +) – (C D \*))) ==> ((A (B C +) \* (C D \*) - ))) ==> A B C + \* C D \* -