

# CARLETON UNIVERSITY

## Department of Systems and Computer Engineering

**SYSC 3101**

**Programming Languages**

**Problem Analysis 2**

Monday, February 27<sup>th</sup>, 2012.

1. Draw a state diagram to recognize one form of the comments of the C-based programming languages, those that begin with /\* and end with \*/.
2. Design a state diagram to recognize the floating-point literals of the C-based programming languages.
3. For the following grammar rules, perform the pairwise disjointness test.
  - a)  $A \rightarrow aB \mid b \mid BB$
  - b)  $A \rightarrow aB \mid bA \mid aBb$
  - c)  $A \rightarrow aaA \mid b \mid caB$
4. Show a complete parse, including the parse stack contents, input string, and action for the string  $id * (id + id)$ , using the grammar and parse table in Table 1.

1.  $E \rightarrow E + T$
2.  $E \rightarrow T$
3.  $T \rightarrow T * F$
4.  $T \rightarrow F$
5.  $F \rightarrow ( E )$
6.  $F \rightarrow id$

State	Action						Goto		
	id	+	*	(	)	\$	E	T	F
0	S5		S4				1	2	3
1		S6				accept			
2		R2	S7		R2	R2			
3		R4	R4		R4	R4			
4	S5			S4			8	2	3
5		R6	R6		R6	R6			
6	S5			S4				9	3
7	S5			S4					10
8		S6			S11				
9		R1	S7		R1	R1			
10		R3	R3		R3	R3			
11		R5	R5		R5	R5			

Table 1: Parsing table