program moduleDeclarations otherModules driverModule otherModules

moduleDeclarations moduleDeclaration moduleDeclarations

moduleDeclarations EPSILON

moduleDeclaration DECLARE MODULE ID SEMICOL

otherModules module otherModules

otherModules EPSILON

module DEF MODULE ID ENDDEF TAKES INPUT SQBO input\_plist1 SQBC SEMICOL ret moduleDef

ret RETURNS SQBO output\_plist1 SQBC SEMICOL

ret EPSILON

driverModule DRIVERDEF DRIVER PROGRAM DRIVERENDDEF moduleDef

moduleDef START statements END

input\_plist1 ID COLON dataType input\_plist2

input\_plist2 COMMA ID COLON dataType input\_plist2

input\_plist2 EPSILON

output\_plist1 ID COLON type output\_plist2

output\_plist2 COMMA ID COLON type output\_plist2

output\_plist2 EPSILON

dataType INTEGER

dataType REAL

dataType BOOLEAN

dataType ARRAY SQBO range\_arrays SQBC OF type

range\_arrays index\_arr RANGEOP index\_arr

type INTEGER

type REAL

type BOOLEAN

statements statement statements

statements EPSILON

statement ioStmt

statement simpleStmt

statement declareStmt

statement conditionalStmt

statement iterativeStmt

ioStmt GET\_VALUE BO ID BC SEMICOL

ioStmt PRINT BO var\_print BC SEMICOL

boolConstt TRUE

boolConstt FALSE

var\_print boolConstt

var\_print ID p1

var\_print NUM

var\_print RNUM

p1 SQBO sign new\_index SQBC

p1 EPSILON

simpleStmt assignmentStmt moduleReuseStmt

assignmentStmt ID whichStmt

whichStmt valueIDStmt

whichStmt valueARRStmt

valueIDStmt ASSIGNOP expression SEMICOL

valueARRStmt SQBO element\_index\_with\_expressions SQBC ASSIGNOP expression SEMICOL

index\_arr sign new\_index

new\_index NUM

new\_index ID

sign PLUS

sign MINUS

sign EPSILON

moduleReuseStmt optional USE MODULE ID WITH PARAMETERS actualParaList SEMICOL

actualParaList sign n8 n9

n8 NUM

n8 RNUM

n8 boolConstt

n8 ID n7

n9 COMMA sign n8 n9

n9 EPSILON

n7 SQBO element\_index\_with\_expressions SQBC

n7 EPSILON

optional SQBO idList1 SQBC ASSIGNOP

optional EPSILON

idList1 ID idList2

idList2 COMMA ID idList2

idList2 EPSILON

expression arithmeticOrBooleanExpr u

u unary\_op new\_NT

new\_NT BO arithmeticExpr BC

new\_NT var\_id\_num

var\_id\_num ID

var\_id\_num NUM

var\_id\_num RNUM

unary\_op PLUS

unary\_op MINUS

arithmeticOrBooleanExpr anyTerm n1

n1 logicalOp anyTerm n1

n1 EPSILON

anyTerm arithmeticExpr n2

anyTerm boolConstt

n2 relationalOp arithmeticExpr

n2 EPSILON

arithmeticExpr term n3

n3 op1 term n3

n3 EPSILON

term factor n4

n4 op2 factor n4

n4 EPSILON

factor BO arithmeticOrBooleanExpr BC

factor NUM

factor RNUM

factor boolConstt

factor ID n5

n5 SQBO element\_index\_with\_expressions SQBC

n5 EPSILON

arrExpr arrTerm arr\_N4

arr\_N4 op1 arrTerm arr\_N4

arr\_N4 EPSILON

arrTerm arrFactor arr\_N5

arr\_N5 op2 arrFactor arr\_N5

arr\_N5 EPSILON

arrFactor ID

arrFactor NUM

arrFactor boolConstt

arrFactor BO arrExpr BC

element\_index\_with\_expressions sign n6

element\_index\_with\_expressions arrExpr

n6 new\_index

n6 BO arrExpr BC

op1 PLUS

op1 MINUS

op2 MUL

op2 DIV

logicalOp AND

logicalOp OR

relationalOp LT

relationalOp LE

relationalOp GT

relationalOp GE

relationalOp EQ

relationalOp NE

declareStmt DECLARE idList1 COLON dataType SEMICOL

conditionalStmt SWITCH BO ID BC START caseStmt1 default1 END

caseStmt1 CASE value COLON statements BREAK SEMICOL caseStmt2

caseStmt2 CASE value COLON statements BREAK SEMICOL caseStmt2

caseStmt2 EPSILON

value NUM

value TRUE

value FALSE

default1 DEFAULT COLON statements BREAK SEMICOL

default1 EPSILON

iterativeStmt FOR BO ID IN range\_for\_loop BC START statements END

iterativeStmt WHILE BO arithmeticOrBooleanExpr BC START statements END

range\_for\_loop index\_for\_loop RANGEOP index\_for\_loop

index\_for\_loop sign\_for\_loop new\_index\_for\_loop

new\_index\_for\_loop NUM

sign\_for\_loop PLUS

sign\_for\_loop MINUS

sign\_for\_loop EPSILON