

Assignment 2

(A1 and A2)

Prog : stmt-list  
stmt-list : stmt stmt-list |  $\epsilon$   
stmt : PRINT stmt' | PRINT string  
stmt' : expr | string  
string : BEGINQUOTE charlist ENDQUOTE  
charlist : LETTER charlist |  $\epsilon$   
expr : term expr'  
expr' : + term expr' | - term expr' |  $\epsilon$   
term : factor term'  
term' : \* factor term' | / factor term' |  $\epsilon$   
factor : (expr) | NUM

FOLLOW:

Prog: \$

A3

FIRST

|                           |                        |
|---------------------------|------------------------|
| prog: PRINT, ε            | BEGINQUOTE: BEGINQUOTE |
| stmt-list: PRINT, ε       | ENDQUOTE: ENDQUOTE     |
| stmt: PRINT               | LETTER: LETTER         |
| stmt': (, NUM, BEGINQUOTE | + : +    - : -         |
| string: BEGINQUOTE        | * : *    ) : )         |
| char-list: LETTER, ε      | / : /    ( : (         |
| expr: (, NUM              | NUM: NUM               |
| expr': +, -, ε            |                        |
| term: (, NUM              |                        |
| term': *, /, ε            |                        |
| factor: (, NUM            |                        |
| PRINT: PRINT              |                        |

A4

term: factor term / factor term  
factor: (expr) | NUM

---

FOLLOW:

Prog: \$  
stmt-list: \$  
stmt: \$, PRINT  
stmt': \$, PRINT  
string: \$  
charlist: ENDQUOTE  
expr: ), \$  
expr': ), \$  
term: +, -, ), \$  
term': +, -, ), \$  
factor: ~~\*~~, /, +, -, ), \$

A5

| Non terminal | Input Symbol               |                 |            |                     |             |             |            |                  |               |             |             |            |
|--------------|----------------------------|-----------------|------------|---------------------|-------------|-------------|------------|------------------|---------------|-------------|-------------|------------|
|              | PRINT                      | BEGINQ          | ENDQUOTE   | LETTER              | +           | -           | )          | *                | /             | NUM         | (           | \$         |
| Pro g        | stmt-list                  |                 |            |                     |             |             |            |                  |               |             |             | $\epsilon$ |
| stmt list    | stmt- <del>stmt-list</del> |                 |            |                     |             |             |            |                  |               |             |             | $\epsilon$ |
| stmt         | PRINT stmt                 |                 |            |                     |             |             |            |                  |               |             |             |            |
| stmt'        |                            | string          |            |                     |             |             |            |                  |               | expr        | expr        |            |
| string       |                            | BQ char list EQ |            |                     |             |             |            |                  |               |             |             |            |
| char list    |                            |                 | $\epsilon$ | LETTER<br>char list |             |             |            |                  |               |             |             |            |
| expr         |                            |                 |            |                     |             |             |            |                  |               | term expr   | term expr   |            |
| expr'        |                            |                 |            |                     | + term expr | - term expr | $\epsilon$ |                  |               |             |             | $\epsilon$ |
| term         |                            |                 |            |                     |             |             |            |                  |               | factor term | factor term |            |
| term'        |                            |                 |            |                     | $\epsilon$  | $\epsilon$  | $\epsilon$ | * factor<br>term | / factor term |             |             | $\epsilon$ |
| factor       |                            |                 |            |                     |             |             |            |                  |               | NUM         | (expr)      |            |

A6

