1. En algunos lenguajes de programación se permite la asignación múltiple, en la que varias variables pueden recibir el mismo valor. Los que siguen son algunos ejemplos de sentencias en los que se hace uso de esta forma de escritura:

a:=inc:=minimo:=expresion;

total:=precio:=expresión;

* 1. Escriba en BNF la sintaxis de este tipo de asignaciones con las siguientes condiciones: la sentencia debe terminar con “;” y el valor de la derecha debe ser una expresión como la desarrollada en el ejercicio 7

|  |  |
| --- | --- |
| **P´ -> P**  **P -> L;**  **L -> id=L**  **L -> id=E**  **E -> E+T**  **E -> E-T**  **E -> T**  **T -> T\*F**  **T -> T/F**  **T -> F**  **F -> id**  **F -> cte**  **F -> (E)** | **<programa´>::=<programa>**  **<programa>::=<lista>;**  **<lista>::=id=<lista>**  **<lista>::=id=<expresion>**  **<expresion>::=<expresion>+<termino>**  **<expresion>::=<expresion>-<termino>**  **<expresion>::=<termino>**  **<termino>::=<termino>\*<factor>**  **<termino>::=<termino>/<factor>**  **<termino>::=<factor>**  **<factor>::=id**  **<factor>::=cte**  **<factor>::=(<expresion>)** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Estado 00**  **P´-> .P**  **P -> .L;**  **L -> .id=L**  **L -> .id=E** | **Estado 01 (00 P)**  **P´-> P.** | **Estado 02 (00 L)**  **P -> L.;** | **Estado 03 (00 id)(05 id)**  **L -> id.=L**  **L -> id.=E** |
| **Estado 04 (02 ;)**  **P -> L;.** | **Estado 05 (04 =)(07 =)**  **L -> id=.L**  **L -> .id=L**  **L -> .id=E**  **L -> id=.E**  **E -> .E+T**  **E -> .E-T**  **E -> .T**  **T -> .T\*F**  **T -> .T/F**  **T -> .F**  **F -> .id**  **F -> .cte**  **F -> .(E)** | **Estado 06 (05 L)**  **L -> id=L.** | **Estado 07 (05 id)(12 id)(13 id)(14 id)(15 id)(16 id)**  **L -> id.=L**  **L -> id.=E**  **F -> id.** |
| **Estado 08 (05 E)**  **L -> id=E.**  **E -> E.+T**  **E -> E.-T** | **Estado 09 (05 T)**  **E -> T.**  **T -> T.\*F**  **T -> T./F** | **Estado 10 (05 F)(12 F)(13 F)(14 F)**  **T -> F.** | **Estado 11 (05 cte)(12 cte)(13 cte)(14 cte)(15 cte)(16 cte)**  **F -> cte.** |
| **Estado 12 (05 ()(12 ()(13 ()(14 ()(15 ()(16 ()**  **F -> (.E)**  **E -> .E+T**  **E -> .E-T**  **E -> .T**  **T -> .T\*F**  **T -> .T/F**  **T -> .F**  **F -> .id**  **F -> .cte**  **F -> .(E)** | **Estado 13 (08 +)(17 +)**  **E -> E+.T**  **T -> .T\*F**  **T -> .T/F**  **T -> .F**  **F -> .id**  **F -> .cte**  **F -> .(E)** | **Estado 14 (08 -)(17 -)**  **E -> E-.T**  **T -> .T\*F**  **T -> .T/F**  **T -> .F**  **F -> .id**  **F -> .cte**  **F -> .(E)** | **Estado 15 (09 \*)(18 \*)(19 \*)**  **T -> T\*.F**  **F -> .id**  **F -> .cte**  **F -> .(E)** |
| **Estado 16 (09 /)(18 /)(19 /)**  **T -> T/.F**  **F -> .id**  **F -> .cte**  **F -> .(E)** | **Estado 17 (12 E)**  **F -> (E.)**  **E -> E.+T**  **E -> E.-T** | **Estado 18 (13 T)**  **E -> E+T.**  **T -> T.\*F**  **T -> T./F** | **Estado 19 (14 T)**  **E -> E-T.**  **T -> T.\*F**  **T -> T./F** |
| **Estado 20 (15 F)**  **T -> T\*F.** | **Estado 21 (16 F)**  **T -> T/F.** | **Estado 22 (17 ))**  **F -> (E).** |  |
|  |  | **PRI(P)={id}**  **PRI(L)={id}**  **PRI(E)={id,cte,(}**  **PRI(T)={id,cte,(}**  **PRI(F)={id,cte,(}** | **SGT(P)={$}**  **SGT(L)={;}**  **SGT(E)={;,+,-,)}**  **SGT(T)={;,+,-,),\*,/}**  **SGT(F)={;,+,-,),\*,/}** |
| **GOTO** | **DESPLAZAMIENTOS** | | **GRAMÁTICA Y ESTADOS** |
| **01 (00 P)**  **02 (00 L)**  **06 (05 L)**  **08 (05 E)**  **09 (05 T)**  **09 (12 T)**  **10 (05 F)**  **10 (12 F)**  **10 (13 F)**  **10 (14 F)**  **10 (15 F)**  **10 (16 F)**  **17 (12 E)**  **18 (13 T)**  **19 (14 T)**  **20 (15 F)**  **21 (16 F)** | **03 (00 id)**  **03 (05 id)**  **04 (02 ;)**  **05 (04 =)**  **05 (07 =)**  **07 (05 id)**  **07 (12 id)**  **07 (13 id)**  **07 (14 id)**  **07 (15 id)**  **07 (16 id)**  **11 (05 cte)**  **11 (12 cte)**  **11 (13 cte)**  **11 (14 cte)**  **11 (15 cte)**  **11 (16 cte)** | **12 (05 ()**  **12 (12 ()**  **12 (13 ()**  **12 (14 ()**  **12 (15 ()**  **12 (16 ()**  **13 (08 +)**  **13 (17 +)**  **14 (08 -)**  **14 (17 -)**  **15 (09 \*)**  **15 (18 \*)**  **15 (19 \*)**  **16 (08 /)**  **16 (09 /)**  **16 (18 /)**  **16 (19 /)**  **22 (17 ))** | **R01 E01 P´ -> P**  **R02 E04 P -> L;**  **R03 E06 L -> id=L**  **R04 E08 L -> id=E**  **R05 E18 E -> E+T**  **R06 E19 E -> E-T**  **R07 E09 E -> T**  **R08 E20 T -> T\*F**  **R09 E21 T -> T/F**  **R10 E10 T -> F**  **R11 E07 F -> id**  **R12 E11 F -> cte**  **R13 E22 F -> (E)** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | P | L | E | T | F | id | cte | = | ; | ( | ) | + | - | \* | / | $ | R |
| 00 | 01 | 02 |  |  |  | D03 |  |  |  |  |  |  |  |  |  |  |  |
| 01 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | OK | R01 |
| 02 |  |  |  |  |  |  |  |  | D04 |  |  |  |  |  |  |  |  |
| 03 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 04 |  |  |  |  |  |  |  | D07 | R02 |  |  |  |  |  |  |  | R02 |
| 05 |  | 06 | 08 | 09 | 10 | DXX | D11 |  |  | D12 |  |  |  |  |  |  |  |
| 06 |  |  |  |  |  |  |  |  | R03 |  |  |  |  |  |  |  | R03 |
| 07 |  |  |  |  |  |  |  | D05 | R11 |  | R11 | R11 | R11 | R11 | R11 |  | R11 |
| 08 |  |  |  |  |  |  |  |  | R04 |  |  | D14 | D14 |  |  |  |  |
| 09 |  |  |  |  |  |  |  |  | R07 |  | R07 | R07 | R07 | D15 | D16 |  |  |
| 10 |  |  |  |  |  |  |  |  | R10 |  | R10 | R10 | R10 | R10 | R10 |  | R10 |
| 11 |  |  |  |  |  |  |  |  | R12 |  |  |  |  |  |  |  | R12 |
| 12 |  |  | 17 | 09 | 10 | D07 | D11 |  |  | D12 |  |  |  |  |  |  |  |
| 13 |  |  |  | 18 | 10 | D07 | D11 |  |  | D12 |  |  |  |  |  |  |  |
| 14 |  |  |  | 19 | 10 | D07 | D11 |  |  | D12 |  |  |  |  |  |  |  |
| 15 |  |  |  |  | 20 | D07 | D11 |  |  | D12 |  |  |  |  |  |  |  |
| 16 |  |  |  |  | 21 | D07 | D11 |  |  | D12 |  |  |  |  |  |  |  |
| 17 |  |  |  |  |  |  |  |  |  |  |  | D14 | D14 |  |  |  |  |
| 18 |  |  |  |  |  |  |  |  | R05 |  | R05 | R05 | R05 | D15 | D16 |  | R05 |
| 19 |  |  |  |  |  |  |  |  | R06 |  | R06 | R06 | R06 | D15 | D16 |  | R06 |
| 20 |  |  |  |  |  |  |  |  | R08 |  | R08 | R08 | R08 | R08 | R08 |  | R08 |
| 21 |  |  |  |  |  |  |  |  | R09 |  | R09 | R09 | R09 | R09 | R09 |  | R09 |
| 22 |  |  |  |  |  |  |  |  | R13 |  | R13 | R13 | R13 | R13 | R13 |  | R13 |

* 1. Hacer el árbol de parsing para el siguiente programa:

actual:=promedio:=contador:= promedio/ 342 + (contador\*contador);

**id=id=id=id/cte+(id\*id);**

|  |  |
| --- | --- |
| **F -> id**  **T -> F**  **F -> cte**  **T -> T/F**  **E -> T**  **F -> id**  **T -> F**  **F -> id**  **T -> T\*F**  **E -> T**  **F -> (E)**  **T -> F**  **E -> E+T**  **L -> id=E**  **L -> id=L**  **L -> id=L**  **P -> L; OK**  **Bison ¿?** |  |