**Exercice 4 :**

1)

P(S)={while,if ,id}

P( C)= p(D)= p(E )={ bid, (}

P(C')= {or,ε}

P(D')={ and, ε}

S(S)= {$, ; , else}

S( C)={do, then}

S( C')=suiv ( C)={do,then}

S(D)=suiv(D')= p(C')/ε U suiv(C )={or,do,then}

S( E)=p(D')/εUsuiv(D)U {)} Usuiv(D')={and, or, do , then, )}

2)

| | while | do | if | then | else | id | = | or | and | bid | ( | ) | ; | $ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S | S→whil e c do S; | | If C then S else S; | | | S→id=i d | | | | | | | | |
| C | | | | | | | | | | C→DC' | C→D C' | | | |
| C' | | C'→ ε | | C'→ ε | | | | C'→o r DC' | | | | | | |
| D | | | | | | | | | | D→ED' | D→E D' | | | |
| D' | | D'→ ε | | D'→ ε | | | | D'→ε | D' →a nd DE' | | | | | |
| E | | | | | | | | | | E→bid | E→(E) | | | |

3)

| Pile | Entrée | Sortie |
|---|---|---|
| $S | If bid then id=id else id=id; $ | |
| $;Selse S then C if | If bid then id=id else id=id; $ | |
| $;Selse S then C | bid then id=id else id=id; $ | |
| $;Selse S then C'D | bid then id=id else id=id; $ | |
| $;Selse S then C'D | bid then id=id else id=id; $ | |
| $;Selse S then C'D'E | bid then id=id else id=id; $ | |

| | | |
|---|---|---|
| $;Selse S then C'D'E | bid then id=id else id=id; $ | |
| $;Selse S then C'D'bid | bid then id=id else id=id; $ | |
| $;Selse S then C'D' | then id=id else id=id; $ | |
| $;Selse S then C' | then id=id else id=id; $ | |
| $;Selse S then | then id=id else id=id; $ | |
| $;Selse S | id=id else id=id; $ | |
| $;Selse id=id | id=id else id=id; $ | |
| $;Selse id= | =id else id=id; $ | |
| $;Selse id | id else id=id; $ | |
| $;Selse | else id=id; $ | |
| $;S | id=id; $ | |
| $;id=id | id=id ; $ | |
| $;id= | =id ; $ | |
| $;id | Id;$ | |
| $; | ;$ | |
| $ | $ | |

Mot accepté

4) S→ if C then S else S;→ if DC' then S else S;→if ED'C' then S else S;→if bid D'C' then S else S;→ if bid C' then S else S;→if bid then S else S;if bid then id=id else S;→if bid then id=id else id=id;

**Exercice 1:**

1)

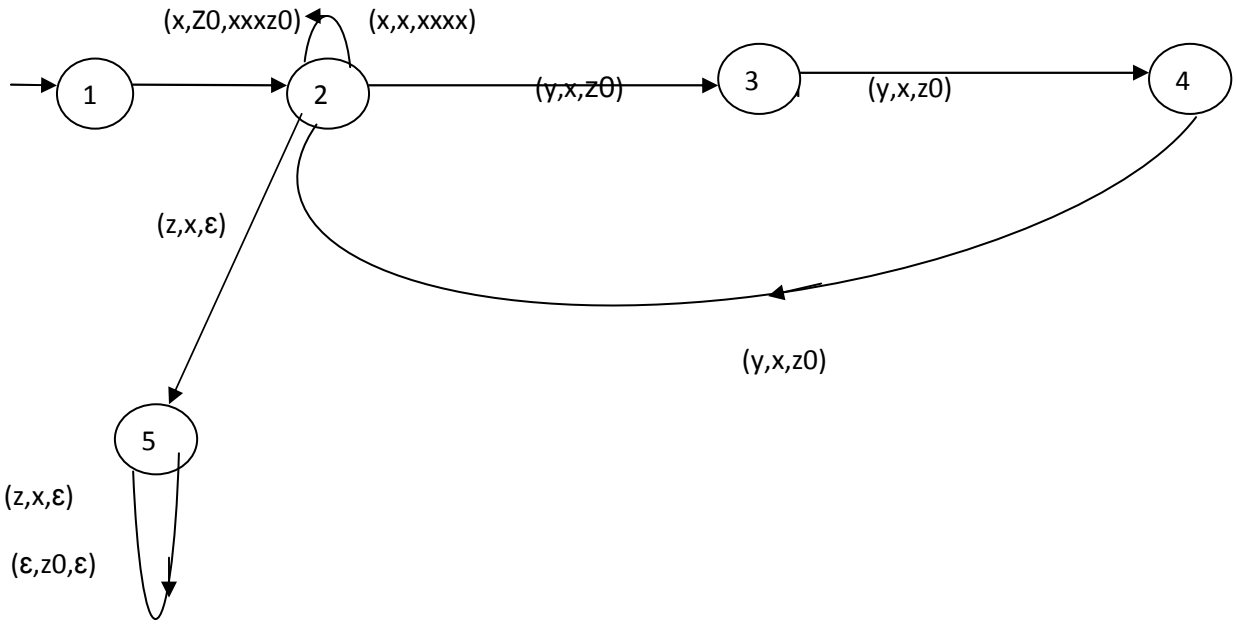
S→xSzzz|xAzzz

A→yyyA|ε

2)

S→xSzzzz→xyyyAzzz→xyyyzzz

3)



4) (1,xyyyzzz,z0)|----- (2,yyyzzz,xxxz0)|------(3,yyzzz,xxxz0) )|------(4,yzzz,xxxz0) )|------(2,zzz,xxxz0) )|------(5,zz,xxz0) )|------(5,z,xz0) )|------(5,ε,z0)

**Exercice 2 :**

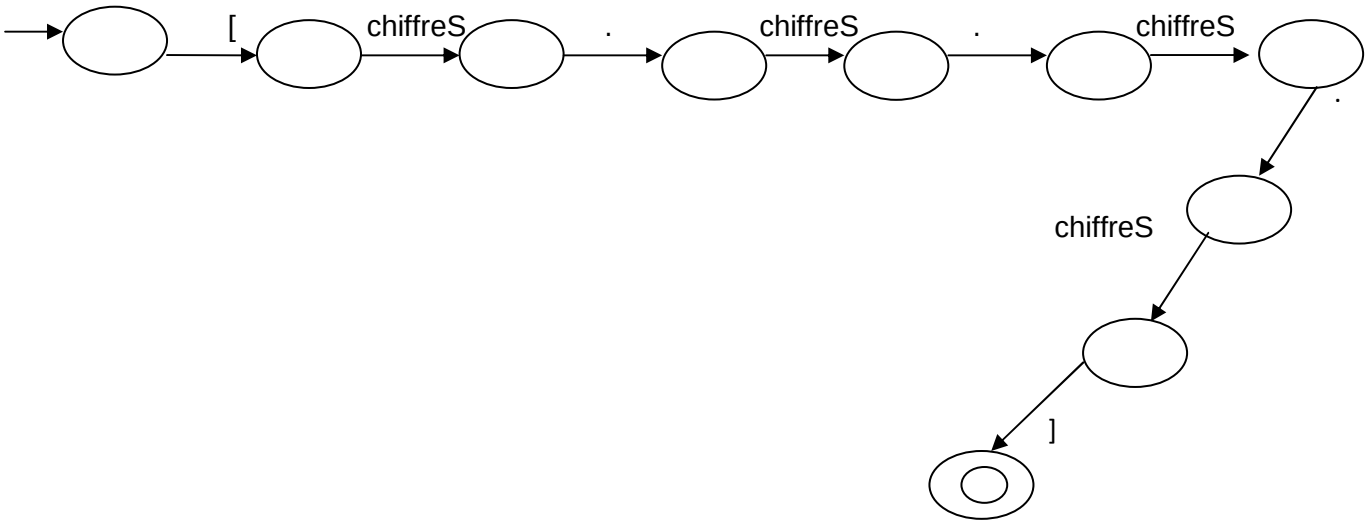
1)

Adresse→ [chiffreS.chiffreS.chiffreS.chiffreS]

chiffreS→chiffre|chiffre chiffre|chiffre chiffre chiffre

chiffre →[0-9]

2)




**Exercice 3 :**

1)

1) S→SAB→baAB→baabAB→baabaB→baababa
2) S→BAS→baAS→baabAS→baababa

2)

S→BASS'|BSAS'|BS'|baS'

S'→ABS'|ε

B→bBB'|baB'

B'→bAB'|ε

A→abBA|abA|a

3)

S→BS''|baS'

S''→ASS'|SAS'|S'

S'→ABS'|ε

B→bB''

B''→BB'|aB'

B'→bAB'|ε

A→abA'|a

A'→BA|A

2eme iteration

S→BS''|baS'

S''→ASS'|SAS'|S'

S'→ABS'|ε

B→bB''

B''→BB'|aB'

B'→bAB'|ε

A→aA''

A''→bA'|ε

A'→BA|A