

(α)

```
<Word> ==>  
<X> ==>  
0<X> ==>  
00<X> ==>  
000<X> ==>  
0000<X> ==>  
00000
```

```
<Word> ==>  
<Let>10<Let> ==>  
1<Let>10<Let> ==>  
11<Let>10<Let> ==>  
1110<Let> ==>  
11100<Let> ==>  
111000<Let> ==>  
111000
```

```
<Word> ==>  
0<Word>1 ==>  
00<Word>11 ==>  
00<X>11 ==>  
00011
```

```
<Word> ==>  
0<Word>1 ==>  
00<Word>11 ==>  
00<Y>11 ==>  
001<Y>11 ==>  
001111
```

(β)

$\langle W \rangle \Rightarrow$
 $\langle X \rangle \Rightarrow$
 $\langle D \rangle \langle X \rangle \langle D \rangle \Rightarrow$
 $a \langle X \rangle \langle D \rangle \Rightarrow$
 $a \langle D \rangle \langle X \rangle \langle D \rangle \langle D \rangle \Rightarrow$
 $aa \langle X \rangle \langle D \rangle \langle D \rangle \Rightarrow$
 $aa \langle D \rangle \langle X \rangle \langle D \rangle \langle D \rangle \langle D \rangle \Rightarrow$
 $aab \langle X \rangle \langle D \rangle \langle D \rangle \langle D \rangle \Rightarrow$
 $aaba \langle D \rangle \langle D \rangle \langle D \rangle \Rightarrow$
 $aabab \langle D \rangle \langle D \rangle \Rightarrow$
 $aababb \langle D \rangle \Rightarrow$
 $aababba$

$\langle W \rangle \Rightarrow$
 $\langle Y \rangle \langle X \rangle \Rightarrow$
 $\langle D \rangle \langle Y \rangle \langle D \rangle \langle X \rangle \Rightarrow$
 $a \langle Y \rangle \langle D \rangle \langle X \rangle \Rightarrow$
 $a \langle D \rangle \langle Y \rangle \langle D \rangle \langle D \rangle \langle X \rangle \Rightarrow$
 $ab \langle Y \rangle \langle D \rangle \langle D \rangle \langle X \rangle \Rightarrow$
 $abb \langle D \rangle \langle D \rangle \langle X \rangle \Rightarrow$
 $abbb \langle D \rangle \langle X \rangle \Rightarrow$
 $abbbb \langle X \rangle \Rightarrow$
 $abbbb \langle D \rangle \langle X \rangle \langle D \rangle \Rightarrow$
 $abbbbba \langle X \rangle \langle D \rangle \Rightarrow$
 $abbbbbaa \langle D \rangle \Rightarrow$
 $abbbbbaaa$

$\langle W \rangle \Rightarrow$
 $\langle X \rangle \langle Y \rangle \Rightarrow$
 $\langle D \rangle \langle X \rangle \langle D \rangle \langle Y \rangle \Rightarrow$
 $a \langle X \rangle \langle D \rangle \langle Y \rangle \Rightarrow$
 $aa \langle D \rangle \langle Y \rangle \Rightarrow$
 $aab \langle Y \rangle \Rightarrow$
 $aab \langle D \rangle \langle Y \rangle \langle D \rangle \Rightarrow$
 $aabb \langle Y \rangle \langle D \rangle \Rightarrow$
 $aabb \langle D \rangle \langle Y \rangle \langle D \rangle \langle D \rangle \Rightarrow$
 $aabba \langle Y \rangle \langle D \rangle \langle D \rangle \Rightarrow$
 $aabbab \langle D \rangle \langle D \rangle \Rightarrow$
 $aabbabb \langle D \rangle \Rightarrow$
 $aabbabbb$