Problem: $L = \{x \mid x = W\#Y, where\ WR\ (reverse\ of\ W)\ is\ a\ substring\ of\ Y\ and\ W,Y\ \varepsilon\ \{0,1\}^*\ \}$

Solution: (CFG)

$S \rightarrow AB$
$A \rightarrow 0A0 \mid 1A1 \mid \#B$
$B \rightarrow 0B \mid 1B \mid \wedge$

Marking Distribution:

25% $Marks \rightarrow W\#W^R$
50% $Marks \rightarrow W\#\{0,1\}^*\ W^R$
50% $Marks \rightarrow W\#\ W^R\{0,1\}^*$;
100% $Marks \rightarrow W\#\ \{0,1\}^*W^R\{0,1\}^*$

Solution: (PDA)

a ⟶ 0
b ⟶ 1

• PDA (Solution)

a, $/A$
a, A/AA
a, B/AB

a, A/A
a, B/B
b, A/A
b, B/B

a, A/∧
b, B/∧

→ (S)   #, $/$ → (A)   (B)
      #, A/A
      #, B/B   ∧, A/A
                    ∧, B/B
                    ∧, $/$ a, $/$
                                        b, $/$
b, $/B$ ∧, $/$
b, B/BB
b, A/BA   ∧, $/$
              (F) ←   (C)

                                        a, $/$
                                        b, $/$