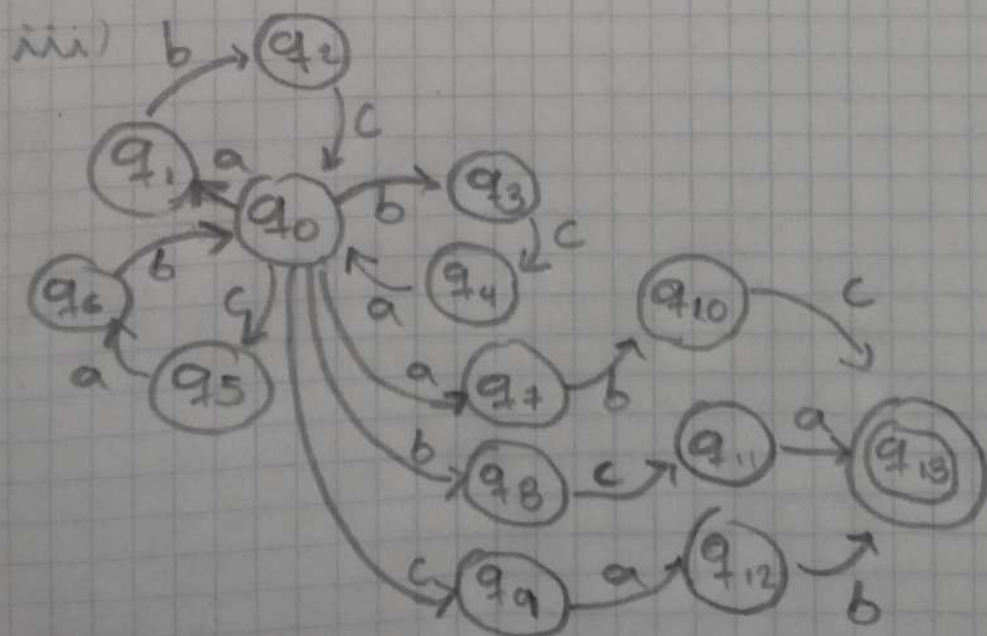
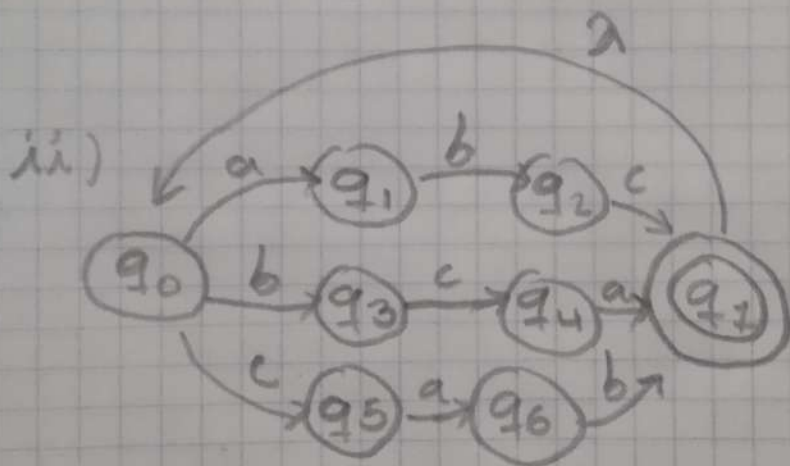
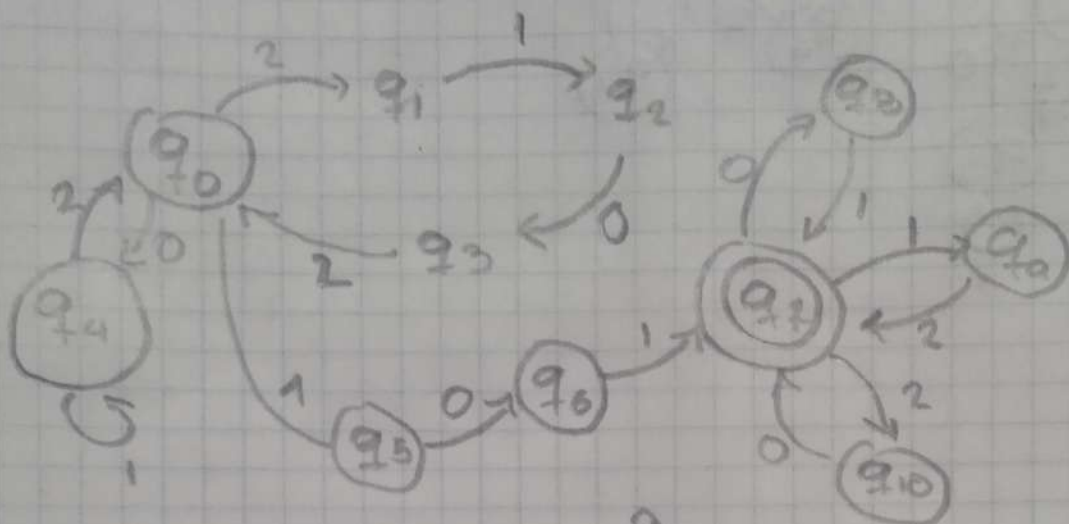
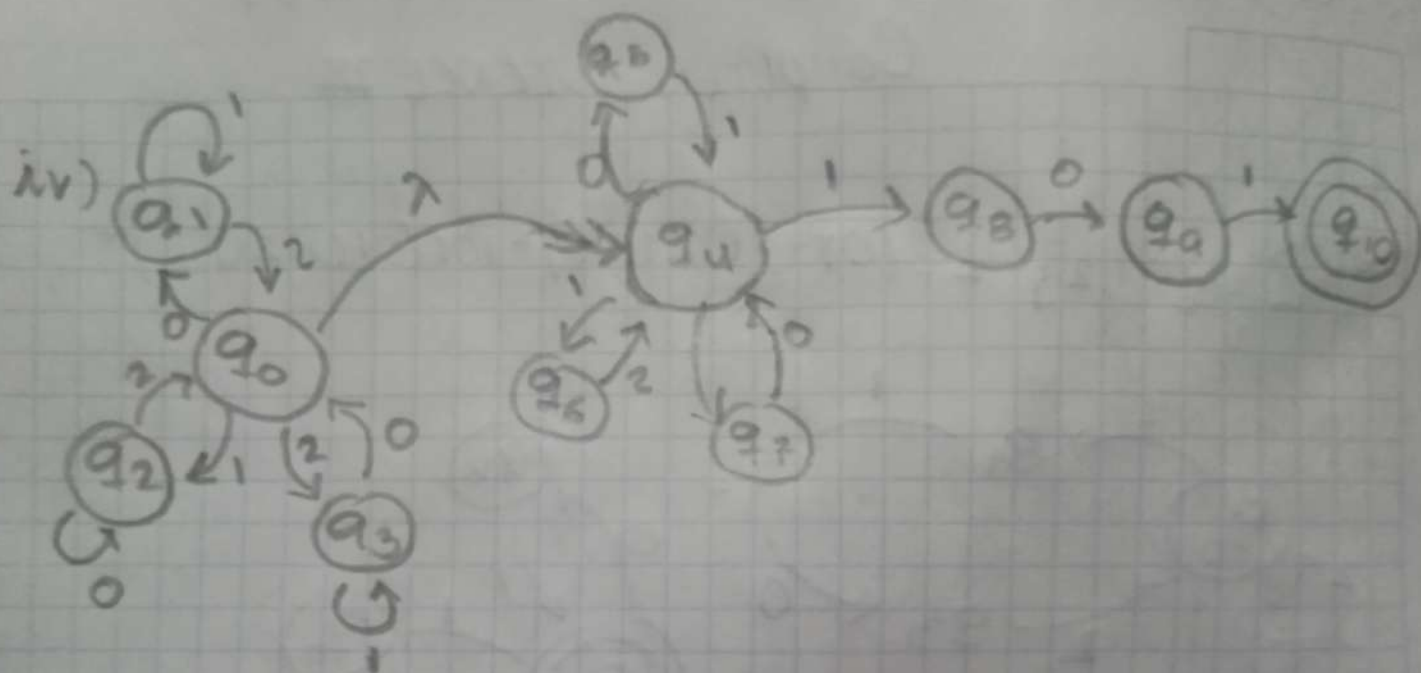


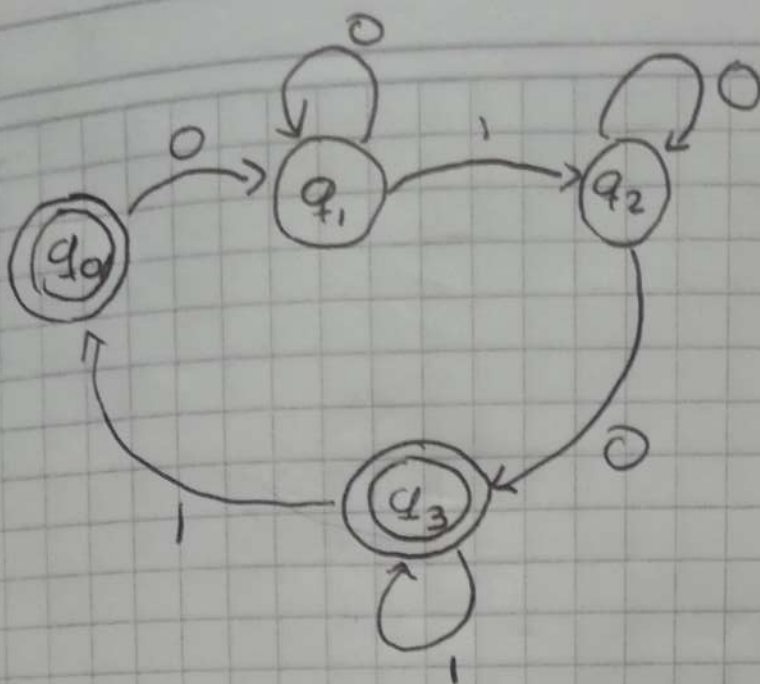
1,

i)  $\Sigma = \{0, 1, 2\}$ .  $L = (01+202102)^* 101(01012020)^*$



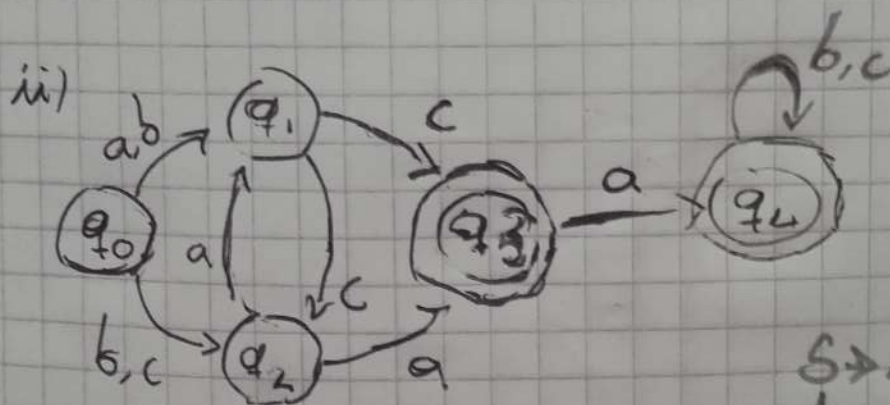


2. i)



$S \rightarrow A$   
 $A \rightarrow \lambda \mid 0B$   
 $B \rightarrow 0B \mid 1C$   
 $C \rightarrow 0C \mid 0D$   
 $D \rightarrow 1D \mid 1A \mid \lambda$

$$(00^*10^*01^*1)^* \cup (00^*10^*01^*)$$



$S \rightarrow A \mid E$   
 $A \rightarrow aB \mid bB$   
 $B \rightarrow caB \mid cC \mid caC$   
 $C \rightarrow aD \mid \lambda$   
 $D \rightarrow bD \mid cD \mid \lambda$   
 $E \rightarrow bF \mid cF$   
 $F \rightarrow acF \mid aC \mid acC$

$$((caub)(ca)^*(c \cup ca)) \cup ((buc)(ac)^*(a \cup ac)))$$

$$(\lambda \cup a(buc)^*)$$



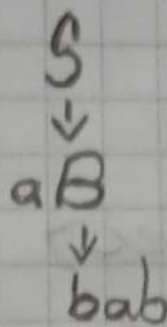
3.1 i)  $S \rightarrow aAd$   
 $A \rightarrow aAd \mid B$   
 $B \rightarrow bBc \mid bc$

ii)  $S \rightarrow AB$   
 $A \rightarrow aAb \mid ab$   
 $B \rightarrow cBd \mid cd$

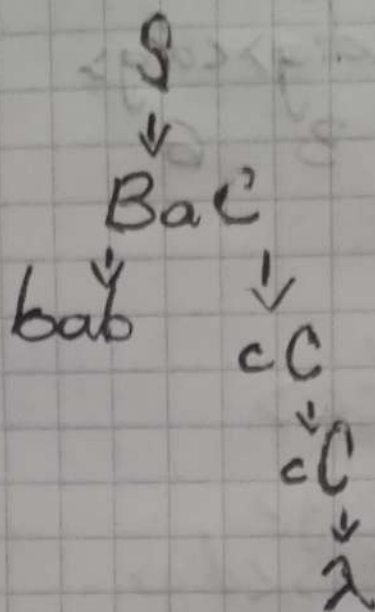
iii)  $S \rightarrow A \mid C$   
 $A \rightarrow aAd \mid aBd$   
 $B \rightarrow cBd \mid cd$   
 $C \rightarrow DE$   
 $D \rightarrow aDb \mid ab$   
 $E \rightarrow cEd \mid cd$

iv)  $S \rightarrow A$   
 $A \rightarrow aAc \mid B$   
 $B \rightarrow bBc \mid bc$

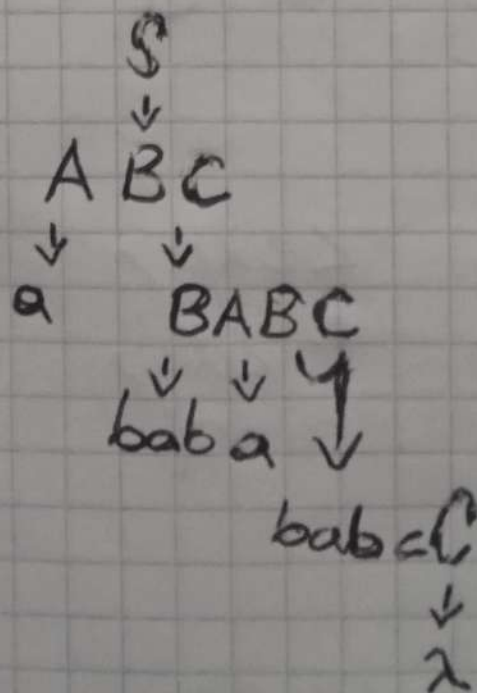
4.1)  $w_1 = abab$



$w_2 = babacc$



$w_3 = ababababe$





$$5.1 \quad W_1 = 47.236$$

$\langle \text{dig} \rangle$	$\langle \text{dec} \rangle$	$\langle \text{exp} \rangle$
$\langle \text{dig} \rangle \langle \text{dig} \rangle$	$\cdot \langle \text{dig} \rangle$	$\lambda$
4      7	$\langle \text{dig} \rangle \langle \text{dig} \rangle$	
	2 $\langle \text{dig} \rangle \langle \text{dig} \rangle$	
	3      6	

$$W_2 = 321.25 E + 35$$

$\langle \text{dig} \rangle$	$\langle \text{dec} \rangle$	$\langle \text{exp} \rangle$
$\langle \text{dig} \rangle \langle \text{dig} \rangle$	$\cdot \langle \text{dig} \rangle$	$E + \langle \text{dig} \rangle$
3 $\langle \text{dig} \rangle \langle \text{dig} \rangle$	$\langle \text{dig} \rangle \langle \text{dig} \rangle$	$\langle \text{dig} \rangle \langle \text{dig} \rangle$
2      1	2      5	3      5

$$W_3 = 0.8 E 9$$

$\langle \text{dig} \rangle$	$\langle \text{dec} \rangle$	$\langle \text{exp} \rangle$
0	$\cdot \langle \text{dig} \rangle$	$E \langle \text{dig} \rangle$
	8	9

$$W_4 = 0.8 E + 9$$

$\langle \text{dig} \rangle$	$\langle \text{dec} \rangle$	$\langle \text{exp} \rangle$
0	$\cdot \langle \text{dig} \rangle$	$E + \langle \text{dig} \rangle$
	8	9

6.)  $w_1 = \text{My Variable}$

<let><ls>

M <let><ls>  
Y <let><ls>

V <let><ls>

a <let><ls>

r <let><ls>

i <let><ls>

a <let><ls>

b <let><ls>

l <let><ls>

e  $\lambda$

$w_3 = \text{String2int}$

<let><ls>

s <let><ls>

t <let><ls>

r <let><ls>

i <let><ls>

n <let><ls>

g <dig><ls>

2 <let><ls>

i <let><ls>

n <let><ls>

+  $\lambda$

$w_2 = \text{temp2}$

<let><ls>

+ <let><ls>

e <let><ls>

m <let><ls>

p <dig><ls>

2  $\lambda$