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Section: BCS-5B
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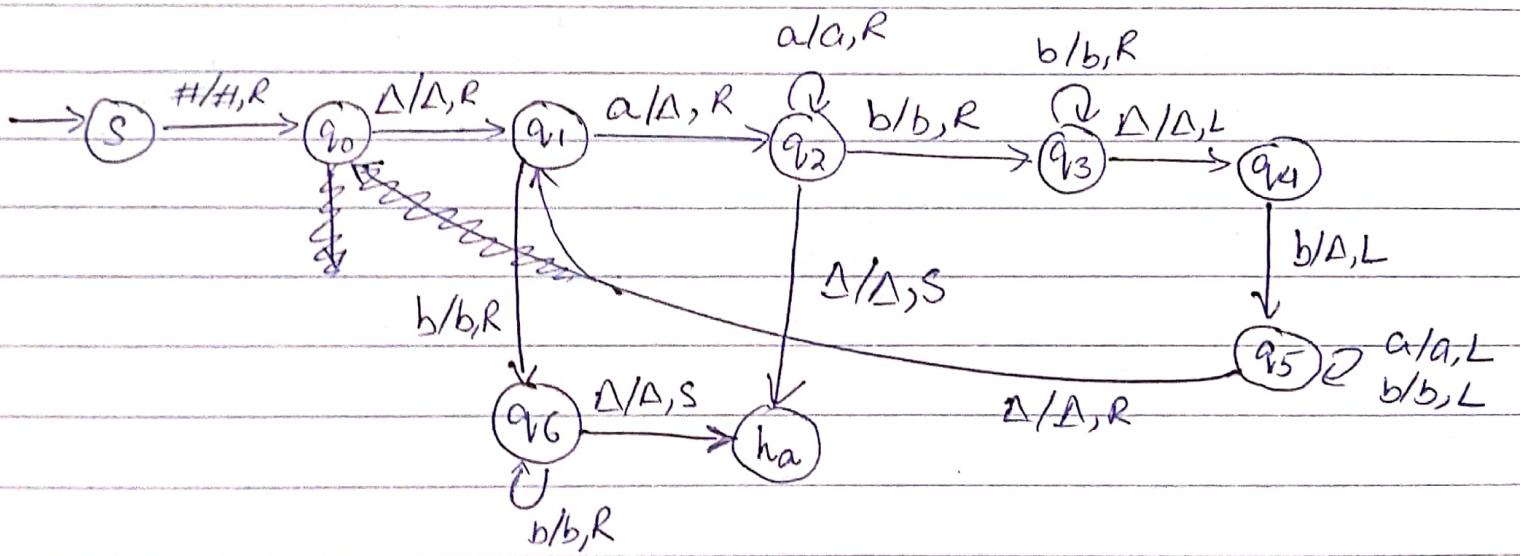
Question 1

For the following language draw a transition diagram for a turing machine. that accepts the language

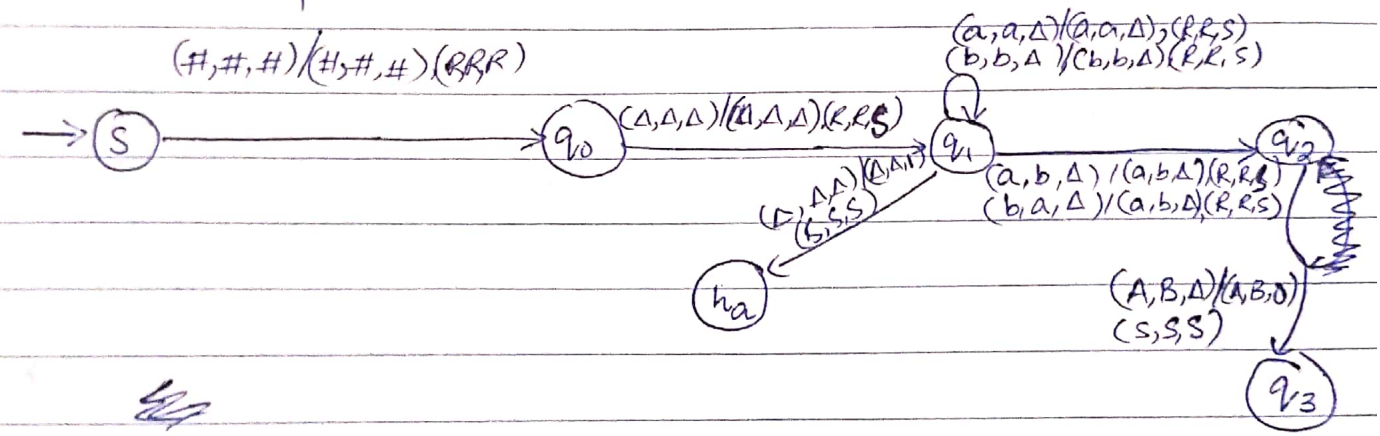
$$\{a^i b^j \mid i \neq j\}$$



Question 2

E: $\{a,b\}^* \times \{a,b\}^* \rightarrow \{0,1\}$ defined by $E(x,y) = 1$ if $x = y$,
$E(x,y) = 0$ otherwise.

Multitape. X on tape 1, Y on tape 2, Result on tape 3



$A = \{a,b\}$

$B = \{a,b\}$

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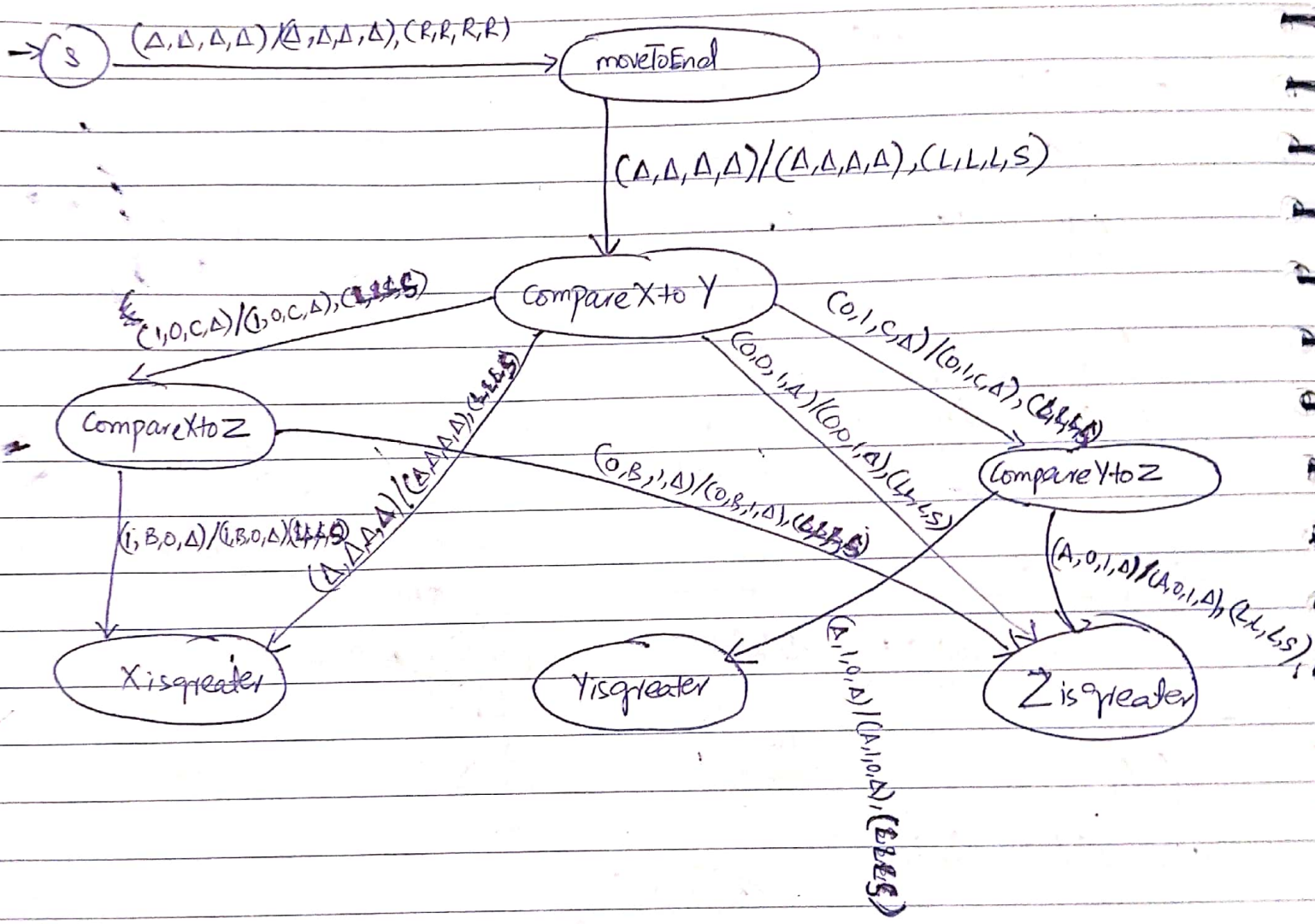
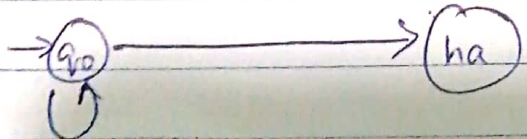
Question 3



moveTo End

(Δ,Δ,Δ,Δ)/(Δ,Δ,Δ,Δ),(S,S,S,S)



(A,B,C,Δ)/(A,B,C,Δ),(R,R,R,S)
(A,Δ,Δ,Δ)/(A,0,0,Δ),(R,R,R,S)
(Δ,B,Δ,Δ)/(0,B,0,Δ),(R,R,R,S)
(Δ,Δ,C,Δ)/(0,0,C,Δ),(R,R,R,S)
(A,B,Δ,Δ)/(A,B,0,Δ),(R,R,R,S)
(A,Δ,C,Δ)/(A,0,C,Δ),(R,R,R,S)
(Δ,B,C,Δ)/(0,B,C,Δ),(R,R,R,S)

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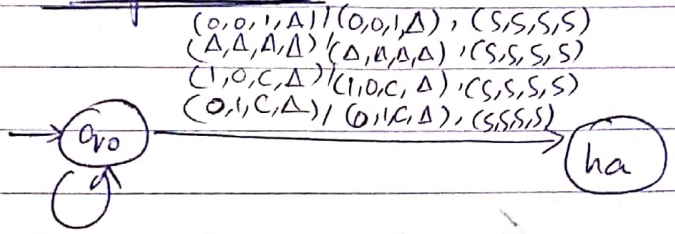
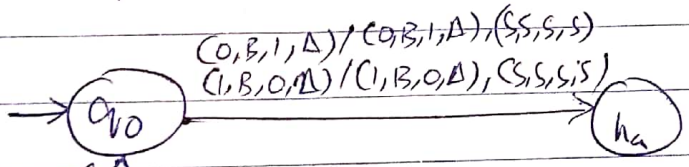
Compare X to Y



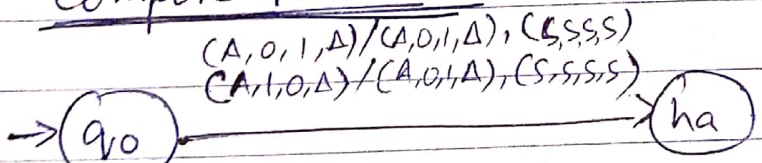
(A,A,A,Δ)/(A,A,A,Δ),(L,L,L,S)

Compare X to Z



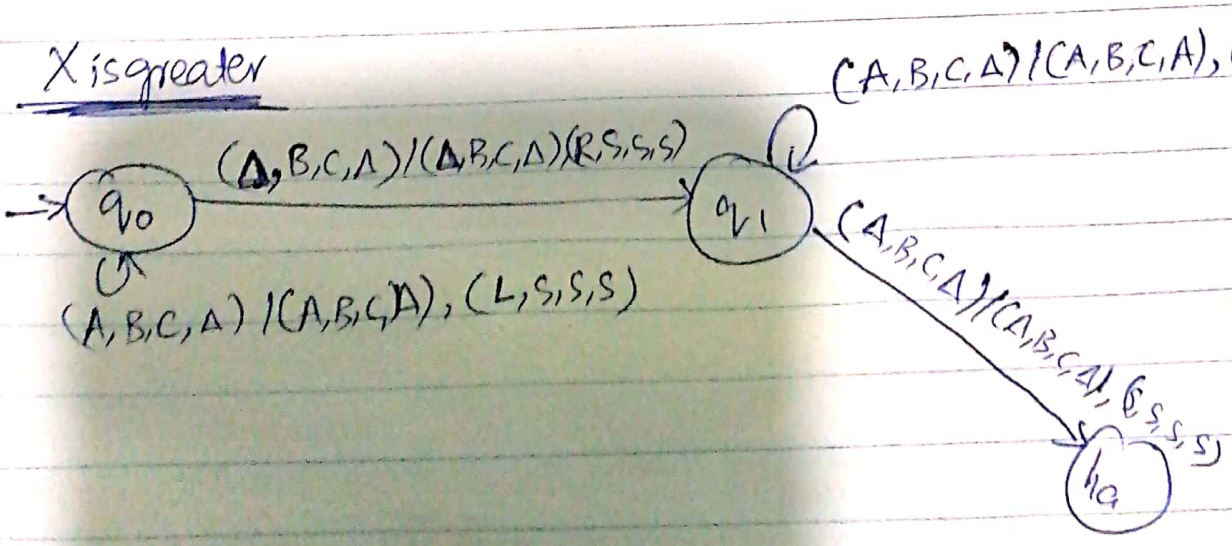
(A,B,A,Δ)/(A,B,A,Δ), (L,L,L,S)

Compare Y to Z



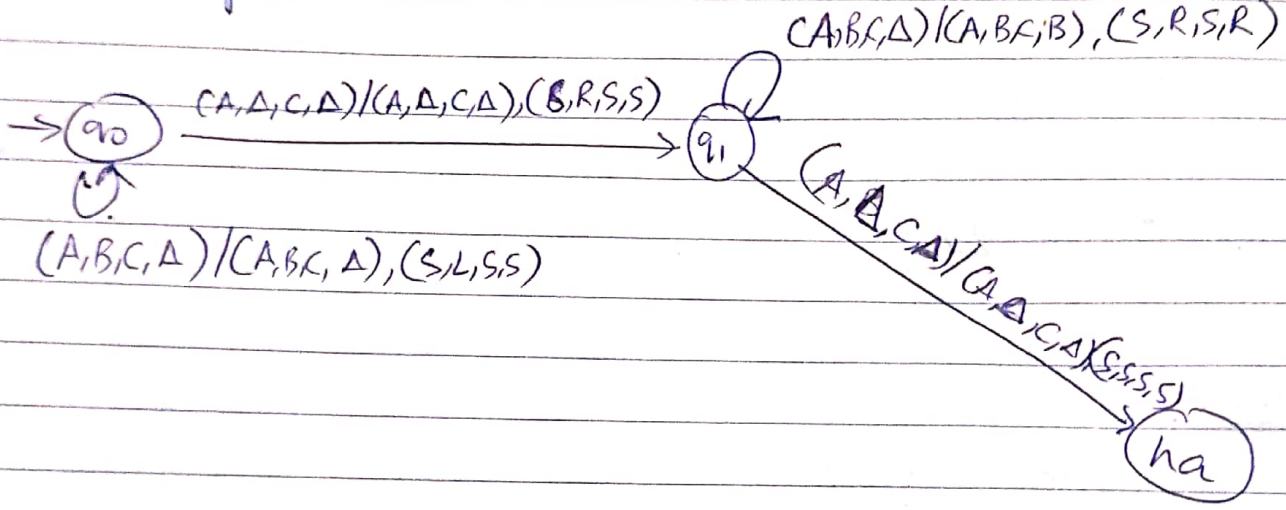
(A,B,B,Δ)/(A,B,B,Δ), (L,L,L,S)

X is greater



(A,B,C,Δ)/(A,B,C,A), (L,S,S,S)

Y is greater



Z is greater