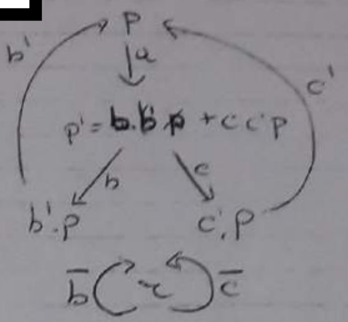
Es 5

Text

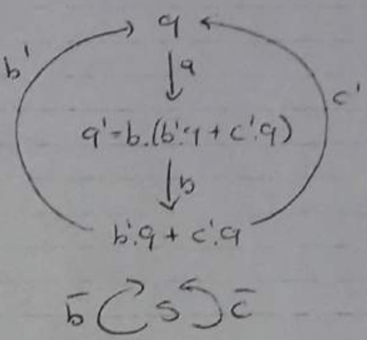
$p \overset{def}{=} \mathrm{rec}\,X.\,(a.(b.b'.X + c.c'.X))$

$r \overset{def}{=} \mathrm{rec}\,Z.\,(\bar{b}.Z + \bar{c}.Z)$



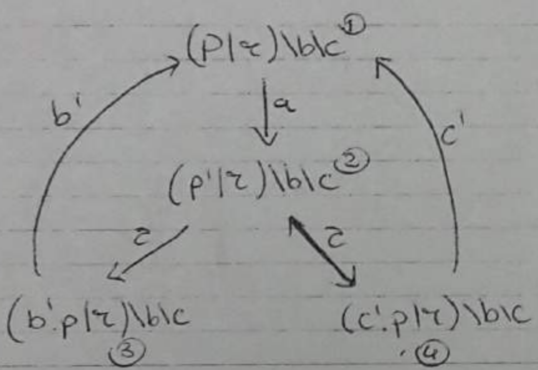
$q \overset{def}{=} \mathrm{rec}\,Y.\,a.(b.(b'.Y + c'.Y))$

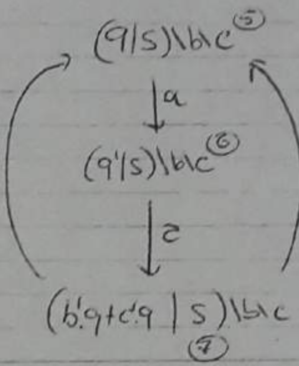
$s \overset{def}{=} (\mathrm{rec}\,V.\,\bar{b}.V) \mid (\mathrm{rec}\,W.\,\bar{c}.W)$



① The LTSs for r and s are isomorphic and thus r and s are strong bisimilar

②





③ $R_0 = \{\{①,②,③,④,⑤,⑥,⑦\}\}$

$R_1 = \{\underset{\Downarrow a}{\{①,⑤\}}, \underset{\Downarrow b'}{\{③\}}, \underset{\Downarrow c'}{\{④\}}, \underset{\Downarrow b'\ \Downarrow c'}{\{②,⑥,⑦\}}\}$

$R_2 = \{\{①,⑤\}, \{③\}, \{④\}, \{②\}, \{⑥,⑦\}\}$ because $② \overset{\tau}{\Rightarrow} ③$ cannot be simulated by ⑥ and ⑦

$R_3 = \{\{①\}, \{⑤\}, \{③\}, \{④\}, \{②\}, \{⑥,⑦\}\}$

$R_4 = R_3$

Thus ① and ⑤ are not equivalent according to weak bisimilarity