CS 302 — 15 December, 2016

QUIZ 9

ANSWER

$G = (\{S,A,B\}, \{a,b,c\}, P, S)$ where productions are :

$P : S \rightarrow SA \mid a \; ; \; A \rightarrow BS \mid Bb \mid a \; ; \; B \rightarrow cA$

(a) Eliminate left recursion : $S \rightarrow aC \; ; \; C \rightarrow AC \mid e$

Eliminate common left symbol **B** : $A \rightarrow BD \mid a \; ; \; D \rightarrow S \mid b$ and keep on substituting to yield **R1** productions (**B** becomes unreachable !) :

$R1 : S \rightarrow aC \; ; \; A \rightarrow cAD \mid a \; ; \; C \rightarrow cADC \mid aC \mid e \; ; \; D \rightarrow aC \mid b$

where $G1 = (\{S,A,C,D\}, \{a,b,c\}, R1, S)$

(b) $(q_c, e, X) \rightarrow (q, Y)$: if $X=S$ then no possible transition; if $X=A$ then $Y=AD$; if $X=C$ then $Y=ADC$; if $X=D$ then no possible transition.