CS 302 — 22 April, 2021

REMOTE QUIZ 7

Duration : 20 minutes

ANSWERS

(a) *(3 pts) See the relevant slide.*

(b) *(7 pts)* $P=(Q=\{q_0,q,q'\} ,\Sigma=\{a,b\} , \Gamma=\{a,b,Z_0\} ,\delta , q_0 ,Z_0)$ *transitions given by* δ *are :*

$(q_0 , a, Z_0) \rightarrow \{(q_0 , Z_0),(q , aZ_0)\}$
$(q, a, a) \rightarrow (q, aa)$
$(q, b, a) \rightarrow (q', e)$
$(q', b, a) \rightarrow (q', e)$
$(q', e, Z_0) \rightarrow (q', e)$

(i) *(3 pts)* $L = \{a^{n+m} b^m ; n \geq 0 , m > 0\}$ *accepted by empty stack by* ***P*** *above.*

(ii) *(1 pt) No! because of* $(q_0 , a, Z_0) \rightarrow \{(q_0 , Z_0),(q , aZ_0)\}$ *P is a nondeterministic PDA.*

(iii) *(3 pts) No!* ***L*** *above does NOT have the* ***prefix property*** *:* $a^3b < a^3b^2$ *are both in* ***L*** *.*

Hence by the theorem proved in class ***L*** *cannot be accepted by a DPDA by empty stack.*