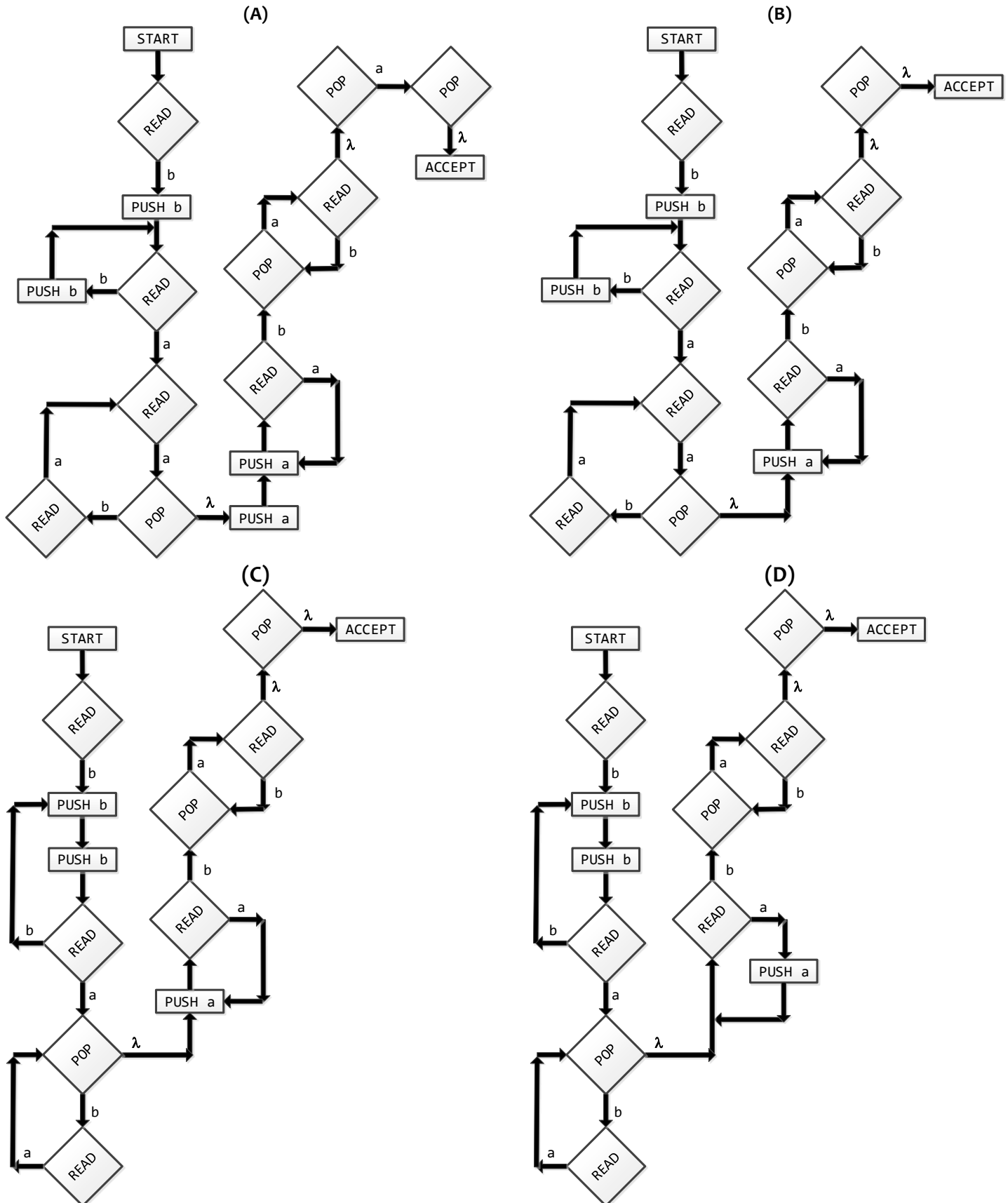




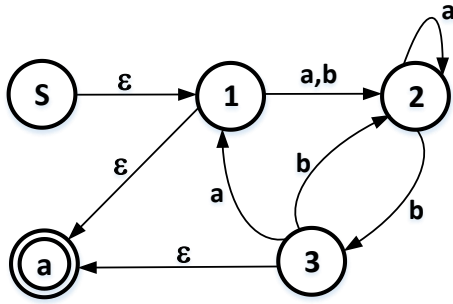
1. Students have to obey [Engineering Faculty Exam Execution Instructions](#).
2. Brief information about the exam will be given at the beginning from lecturer, then no one is allowed to ask a question during the exam.
3. Questions are related to 1,2,12 of [Program Learning Outcomes](#).

NUMBER :	NAME :	SIGNATURE :	GRADE :
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1. Which PDA does not accept the language $L = \{ b^i a^j b^k, j=2i+k+1, i>0, k>0 \}$? (40P)

You'll loose 5P from wrong answer!

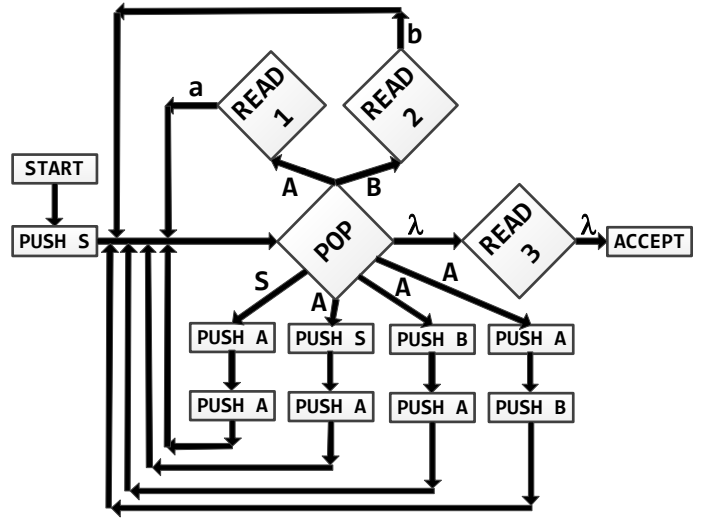


2. Write FA state deletion orders for the REs below. (30P)

$[(a+b)(a+bb)^*ba]^*[\epsilon+(a+b)(a+bb)^*b]$			
$[(a+b)a^*b(ba^*b)^*a]^*[\epsilon+(a+b)a^*b(ba^*b)^*]$			
$\epsilon+(a+b)a^*b[[b+a(a+b)]a^*b]^*(\epsilon+a)$			
$\epsilon+(a+b)a^*b[ba^*b+a(a+b)a^*b]^*(\epsilon+a)$			
$\epsilon+(a+b)[a+b[b+a(a+b)]]^*b(\epsilon+a)$			
$\epsilon+(a+b)[a+bb+ba(a+b)]^*(b+ba)$			

$S \rightarrow AA$
 $A \rightarrow AS \mid AB \mid BA \mid a$
 $B \rightarrow b$

3. Draw the parse tree for the **babaaa** word using nondeterministic PDA equivalent of the grammar above and the table. (30P)



	State	Stack	Tape	16	Push A	AA	babaaa
01	Push S	S	babaaa	17	Push A	AAA	babaaa
02	Pop	λ	babaaa	18	Pop	AA	babaaa
03	Push A	A	babaaa	19	Push A	AAA	babaaa
04	Push A	AA	babaaa	20	Push B	BAAA	babaaa
05	Pop	A	babaaa	21	Pop	AAA	babaaa
06	Push A	AA	babaaa	22	Read 2	AAA	babaaa
07	Push B	BAA	babaaa	23	Pop	AA	babaaa
08	Pop	AA	babaaa	24	Read 1	AA	babaaa
09	Read 2	AA	babaaa	25	Pop	A	babaaa
10	Pop	A	babaaa	26	Read 1	A	babaaa
11	Push S	SA	babaaa	27	Pop	λ	babaaa
12	Push A	ASA	babaaa	28	Read 1	λ	babaaa
13	Pop	SA	babaaa	29	Pop	λ	babaaa
14	Read 1	SA	babaaa	30	Read 3	λ	babaaa
15	Pop	A	babaaa	31	Accept	λ	babaaa

