


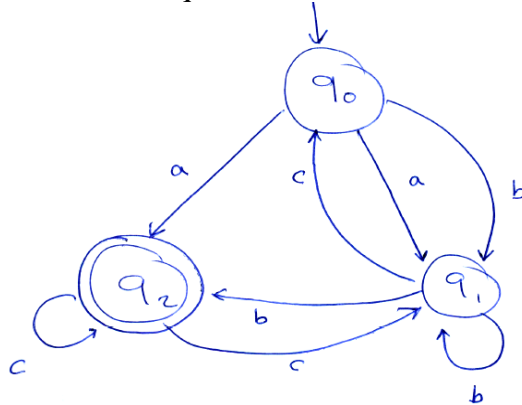
QFO-AP-FI-021	اسم النموذج: نموذج حل الامتحان	جامعة فيلادلفيا
رقم الاصدار: 2	الجهة المصدرة: كلية تكنولوجيا المعلومات	 Philadelphia University
Revision 2		
التاريخ: 2018/11/14	الجهة المدققة: عمادة ضمان الجودة	
عدد صفحات النموذج: 1		

Lecturer: Prof. Nameer N. EL-Emam
Internal Examiner: Dr. Raad Alwan
Semester one of academic year: 2019-2020
Department of CS
Course Name: Computation Theory
Date: 18/12/2019
Time: 50 min.

Second Exam

Q1/(7 marks)

Convert the following NFA machine to the equivalent DFA machine:



Q1/

$$M_{NFA} = \langle Q, I, q_0, \delta, F \rangle$$

$$M_{DFA} = \langle Q_D, I_D, q_{0D}, \delta_D, F_D \rangle$$

$$\text{e.g. } Q = \{q_0, q_1, q_2\}$$

$$\text{then } Q_D = \{q_0, q_1, q_2, q_{01}, q_{02}, q_{12}, q_{012}\}$$

$$I = \{a, b, c\} = I_D$$

$$q_0 = q_{0D} \Rightarrow q_0$$

$$F = \{q_2\} \Rightarrow F_D = \{q_2, q_{02}, q_{12}, q_{012}\}$$

$$\delta_D(q_0, a) = q_{12}$$

$$\delta_D(q_{01}, a) = q_{12}$$

$$\delta_D(q_0, b) = q_1$$

$$\delta_D(q_{01}, b) = q_{12}$$

$$\delta_D(q_1, b) = q_{12}$$

$$\delta_D(q_{01}, c) = q_0$$

$$\delta_D(q_1, c) = q_0$$

$$\delta_D(q_2, c) = q_{12}$$

$$\delta_D(q_{01}, a) = q_{12}$$

$$\delta_D(q_{02}, b) = q_1$$

$$\delta_D(q_{02}, c) = q_{12}$$

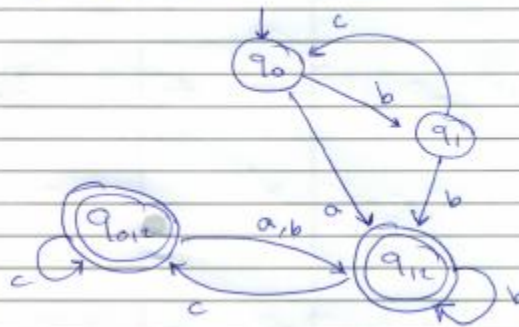
$$\delta_D(q_{12}, b) = q_{12}$$

$$\delta_D(q_{12}, c) = q_{012}$$

$$\delta_D(q_{12}, a) = q_{12}$$

$$\delta_D(q_{012}, b) = q_{12}$$

$$\delta_D(q_{012}, c) = q_{012}$$

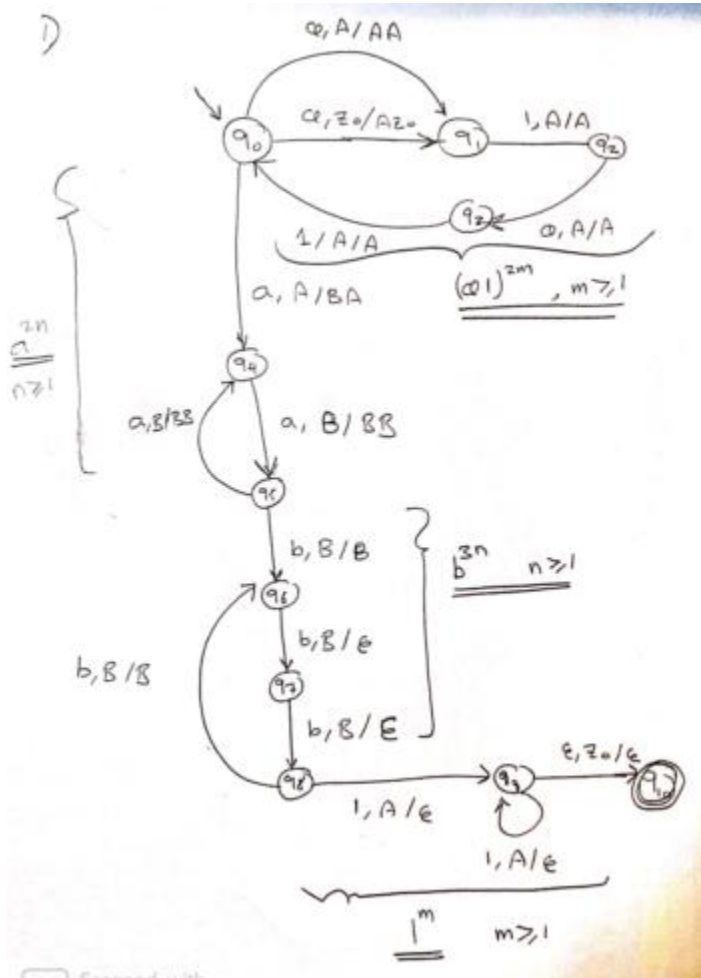


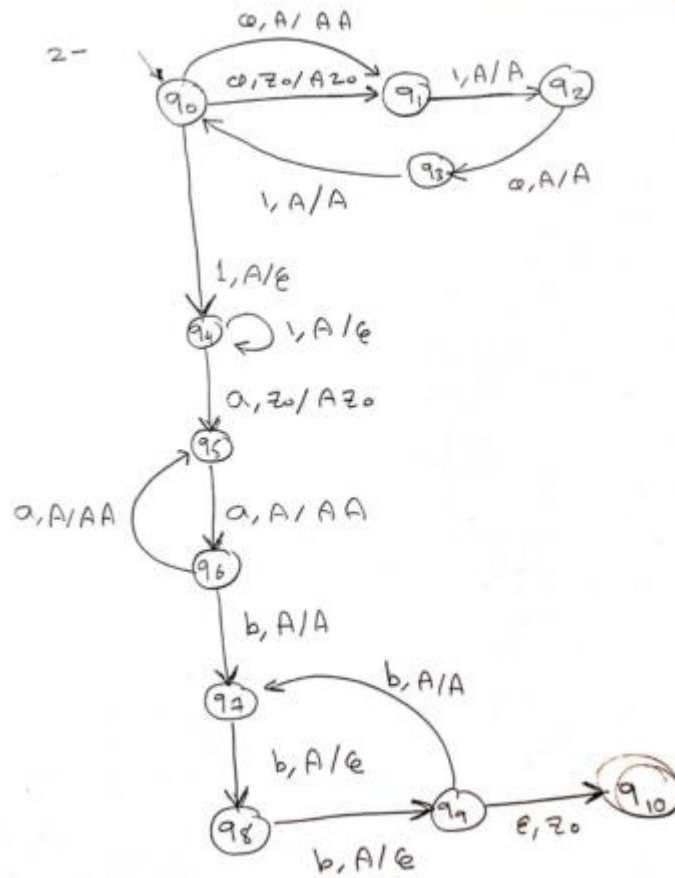
Q2/(7 marks)

Construct PDA as language acceptor that recognizes each of the following languages:

$$1 - L = \{(01)^{2m} a^{2n} b^{3n} 1^m \mid n, m \geq 1\}$$

$$2 - L = \{(01)^{2m} 1^m a^{2n} b^{3n} \mid n, m \geq 1\}$$



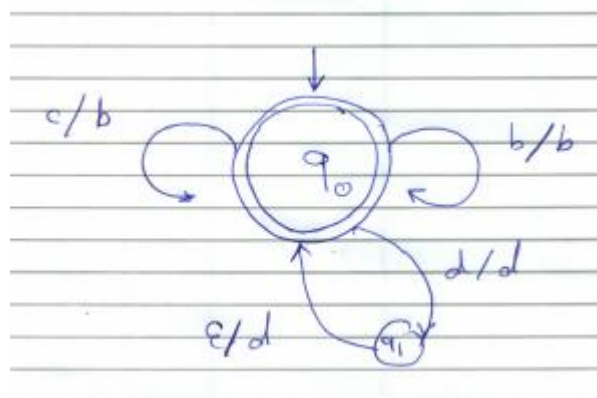


Q3/(6 marks)

Construct FSAT that accepts L1 and produces L2:

$$L1 = ((b+c)^* + d^*)^*$$

$$L2 = (b^* + dd^*)^*$$



GOOD LUCK