No:
Adı-Soyadı (Name-Surname):

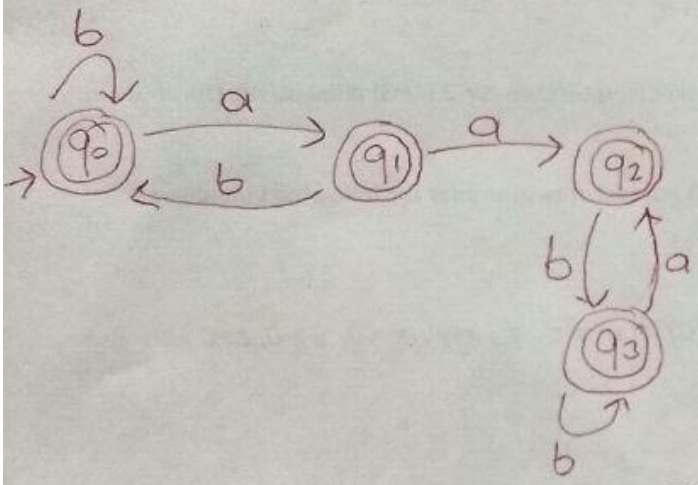
05.08.2019
17:00-18:10

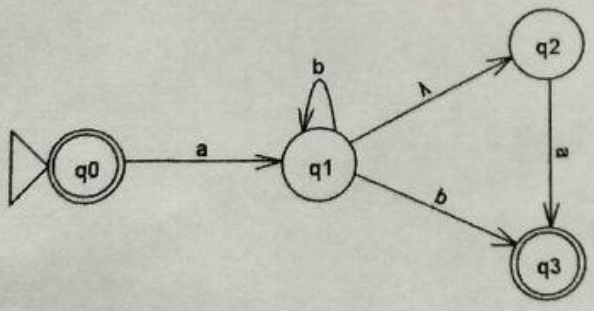
KBÜ BİLGİSAYAR MÜHENDİSLİĞİ BÖLÜMÜ
BLM323 OTOMATA TEORİSİ
YAZ OKULU ARA SINAV SORULARI

S1) Aşağıda tanımı verilen makineyi tasarlayınız.

Bir DFA ∑ = {a, b} alfabesinden oluşan ve "aa" alt stringinin birden fazla oluşumunu içeren stringler hariç tüm stringleri tanımaktadır. (15 puan)
Örn: "aaa" iki tane "aa" içerir, dolayısıyla kabul edilmez.

Q1) Construct a machine following: A DFA accepts all strings containing no more than one occurrence of the string "aa" in the alphabet ∑ = {a, b} (15 pts.)
Exp: "aaa" contains two occurrences of "aa" then it is not accepted.





S2) Yukarıdaki Sonlu Otomataya göre tablodaki stringlerin ACCEPT/REJECT (KABUL/RET) durumlarını işaretleyiniz. (14 puan)

Q2) Specify the ACCEPT/REJECT status of the strings in the table according to the above Finite Automata. (14 pts.)

String	Accepted (Kabul)	Rejected (Ret)
λ	✓	
a		✓
ba		✓
ab	✓	
abba	✓	
aa	✓	
aaa		✓

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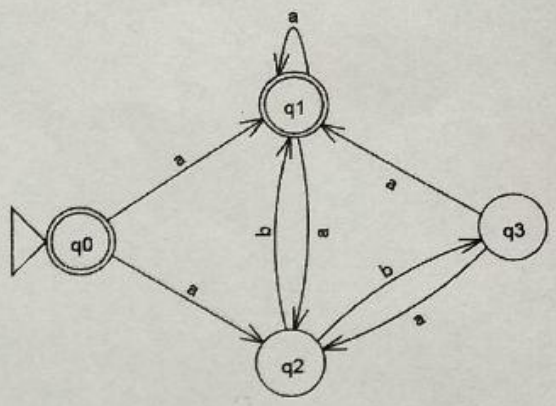
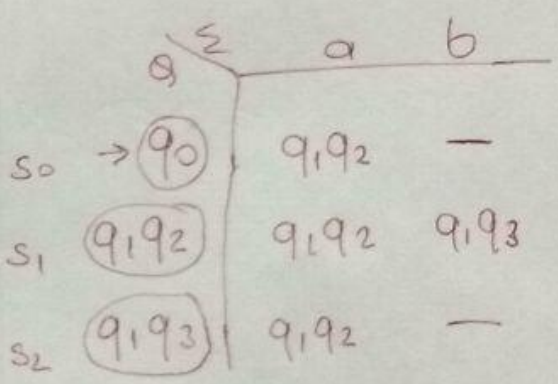
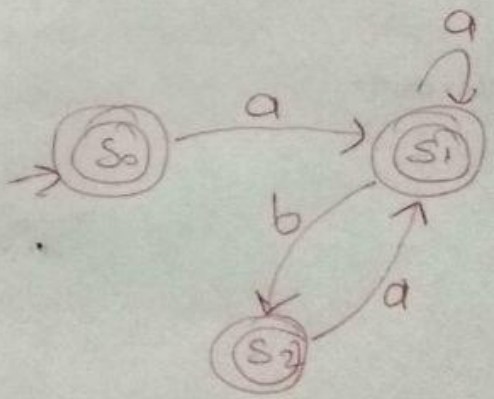


S3) Yukarıdaki NFA'ya denk DFA'yı bulunuz. (15 puan)

Q3) Convert the above NFA to DFA. (15 pts.)

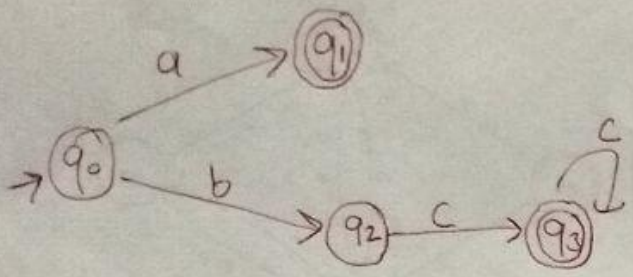




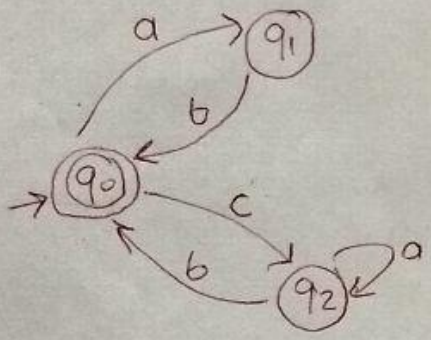
S4) Aşağıdaki Düzenli Deyimlerin Sonlu Otomata karşılıklarını bulunuz. (25 puan)

Q4) Find the FAs equivalent to the REs following. (25 pts.)

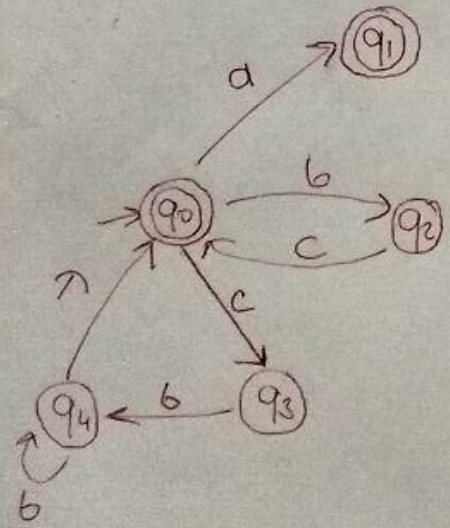
A) a + bcc*



B) (ab + ca*b) *



C) a + (bc + cbb*) *



S5) Aşağıdaki gramerlerin türettiği dillerin tanımını yapınız. (20 puan)

Q5) Write a description of the language generated by following grammars (20 pts.)

A) S -> aSa | aAa
A -> bA | λ

$L = \{ a^n b^n a^m \mid m \geq 1, n \geq 0 \}$

B) S -> aSb | aSbbb| ab

$L = \{ a^m b^n \mid 1 \leq n \leq m \leq 3n \}$

S6) Aşağıdaki dilleri türeten tür-2 (CFG) dilbilgisi oluşturunuz. (20 puan)

Q6) Write a context-free grammar for following languages (20 pts.)

A) $L(G) = \{ a^x b^y c^z,\ z = x+y,\ x > 0,\ y > 0, z > 0 \}$

$S \rightarrow aSc \mid aAc$
$A \rightarrow bAc \mid bc$

B) $L(G) = \{ w \mid w \in (0+1)^*, |w| \text{ is odd} \}$
(length of w is odd, w stringinin uzunluğu tek)

$S \rightarrow 0A \mid 1A$
$A \rightarrow 0S \mid 1S \mid \lambda$