No:
Adı-Soyadı (Name-Surname):

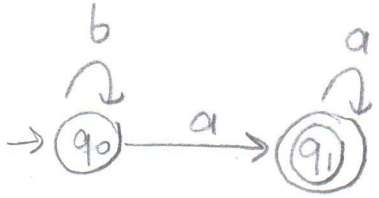
01.08.2018
11:00-12:10

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

S1) Aşağıda tanımı verilen makineyi tasarlayınız.

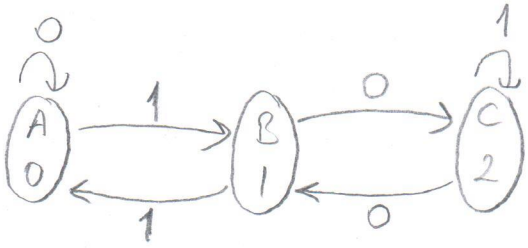
Bir DFA Σ = {a, b} alfabesinden oluşan ve "a" içerip, "ab" içermeyen dizgileri tanımaktadır. (20 puan)

Q1) Construct a machine following: A DFA accepts a string that contains "a" and does not contain "ab" in the alphabet Σ = {a, b} (20 pts.)



S2) İkilik bir sayının 3 ile bölümünden kalanı (mod3) çıktı olarak veren bir Moore makinesi tasarlayınız. (10 puan)

Q2) Construct a Moore machine that gives an output of mod3 for binary numbers. (10 pts.)



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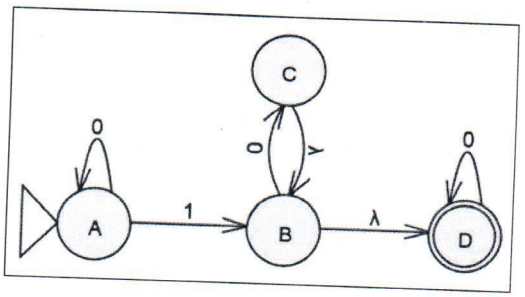
SUMMER SCHOOL MIDTERM EXAM QUESTIONS

S3) Aşağıdaki NFA'daki λ- geçişlerini yok ediniz. NFA'nın son halini çiziniz. (20 puan)

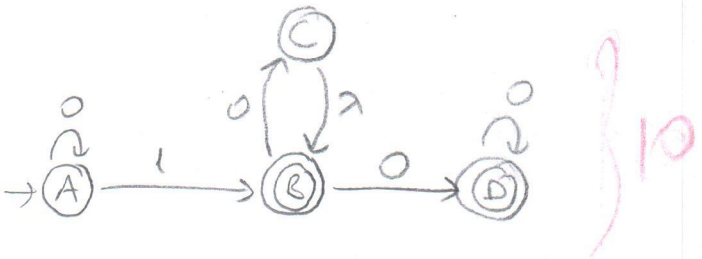
Q3) Remove λ- transtions for following NFA. Draw the final NFA. (20 pts.)



$\delta(B,\lambda)=D$

$\delta(D,0)=D \Rightarrow \delta(B,0)=D$

B final

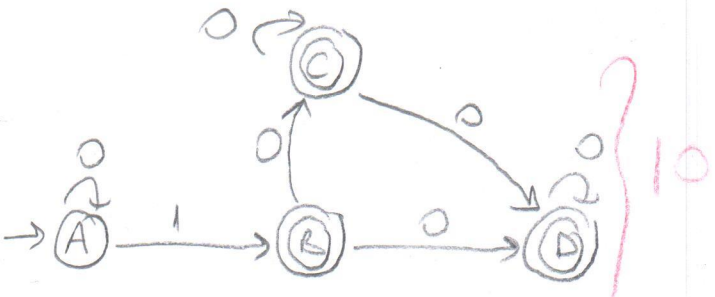


10

$\delta(C,\lambda)=B$

$\delta(B,0)=D \Rightarrow \delta(C,0)=D$

$\delta(B,0)=C \Rightarrow \delta(C,0)=C$



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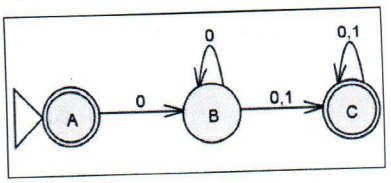
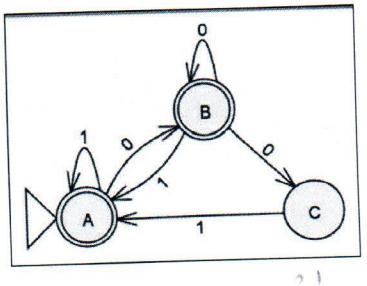
S4) Aşağıda sonlu otomalara ait düzgün deyimleri bulunuz. (30 puan)

Q4) Convert the following FAs to REs. (30 pts.)



RE: $\lambda + 00^*(0+1)(0+1)^*$ 10

RE(A) RE(C)



RE: RE(A) + RE(B) 25

$A = \lambda + A1 + B1 + C1$
$B = A0 + B0$
$C = B0$ } 5

$B = A0 + B0 = A00^*$

$C = B0 = A00^*0$

$A = \lambda + A1 + B1 + C1$

$A = \lambda + A1 + A00^*1 + A00^*01$

$A = \lambda + A(1 + 00^*1 + 00^*01)$

$A = (1 + 00^*1 + 00^*01)^*$ } 10

$B = A00^*$

$B = (1 + 00^*1 + 00^*01)^* 00^*$ } 10

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

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

A) S -> XY
X -> aXb | abab
Y -> Ybc | λ

L = $\{ a^* abab\, b^x (bc)^y \mid x \geq 0, y \geq 0 \}$

B) S -> Sa | Aa
A -> Ab | B
B -> Bcc | cc

L = $\{ c^{2z} b^y a^x \mid x \geq 1, y \geq 0, z \geq 1 \}$

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

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

A) L(G) = { $a^{x+2} b^{y+1}$, $x \geq 1$, $y > 2x$ }

i) S → aaaAbbbb
A → aAbbb | Abb | λ

ii) - - -

B) L(G) = { $a^x b^y c^z$, $y \geq 1$, $z \geq 1$, $x > y + z$ }

i) S → aAc
A → aAc | B
B → aCb
C → aCb | D
D → aAa

ii) S → aSc | aAc
A → aAb | aAa

iii) - - - - - - -