

Öğr. No. (Std. No.) :

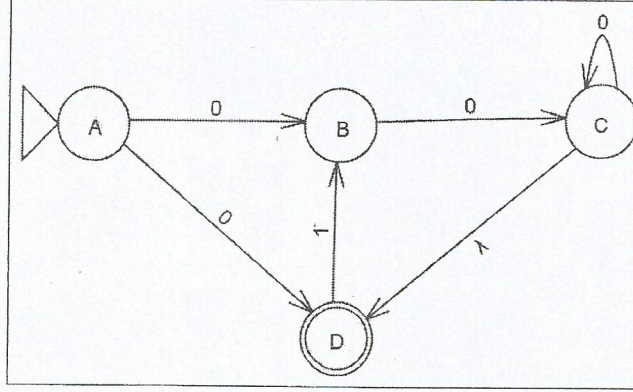
Ad (Name) :

Soyad (Surname) :

1	2	3	4	TOTAL

KARABUK UNIVERSITY, DEPARTMENT OF COMPUTER ENGINEERING
BLM322-OTOMATA TEORİSİ, CME322-AUTOMATA THEORY
Yaz Okulu Final Sınavı, Summer School Final Exam, 21.08.2017

S1) Q1)



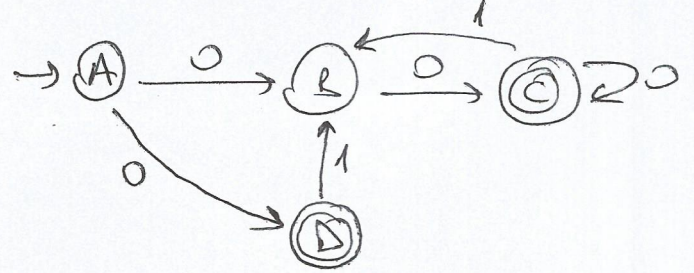
A) (15 p.) Yukarıda verilen NFA'nın λ -geçişini (C-D arası) yok ediniz. λ -geçişini yok ettikten sonra oluşan yeni NFA'yı çiziniz. (Remove λ -transition (between C and D) for the NFA that is given above. Show the NFA after removing λ -transition.)

B) (25 p.) λ -geçiş yok edilen NFA'ya ait RE'yi bulunuz. (Convert NFA to RE after removing λ -transition.)

A) $\delta(C, \lambda) = D$

$\delta(D, 1) = B \Rightarrow \delta(C, 1) = B$

C final



B) $A = \lambda$

$B = A0 + C1 + D1$

$C = B0 + C0$

$D = A0 = 0$

$B = A0 + D1 + C1$

$B = 0 + 01 + C1$

$C = B0 + C0$

$C = (0 + 01 + C1)0 + C0$

$C = 00 + 010 + C10 + C0$

$C = 00 + 010 + C(10 + 0)$

$C = (00 + 010)(10 + 0)^*$

$RE(C) + RE(D)$

$(00 + 010)(10 + 0)^* + 0$

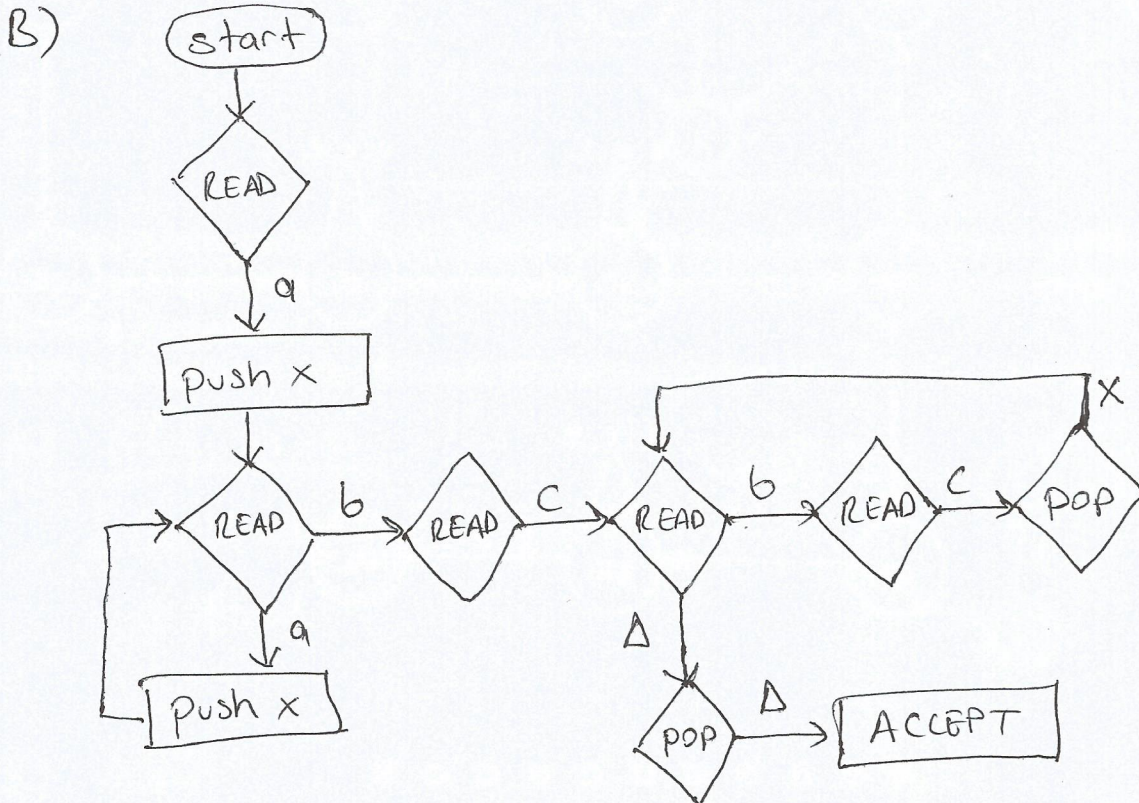
S2) Q2)

$$L = \{a^n (bc)^{n+1} \mid n \geq 1\}$$

A) (10 p.) L dili için bir tür-2 dilbilgisi (CFG) oluşturunuz. (Write a CFG (type-2 grammar) for the language L.)

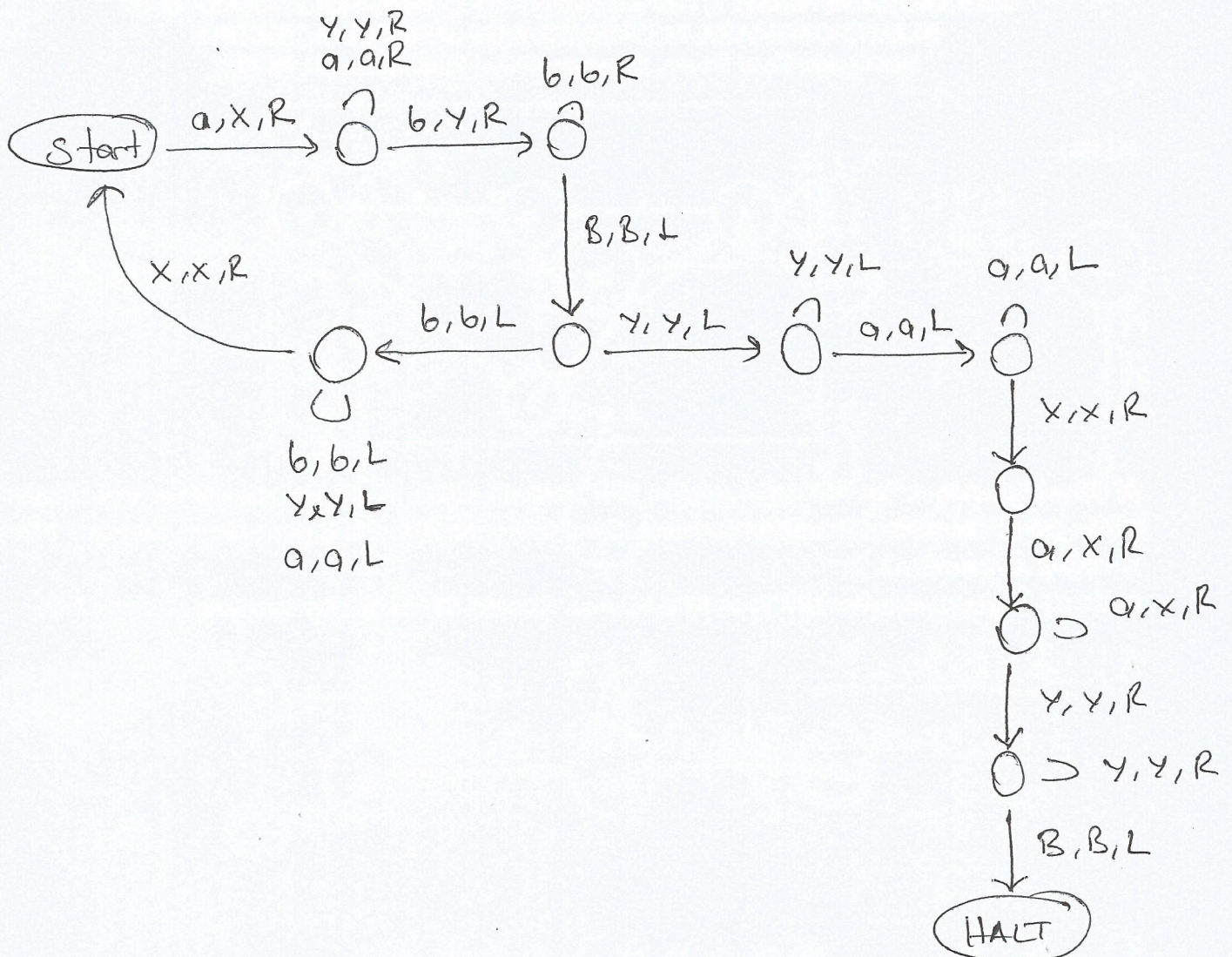
B) (25 p.) L dili bir PDA tasarlayınız. (Construct a PDA for the language L.)

A) $S \Rightarrow aSbc \mid abc bc$ $S \Rightarrow aAbc bc$
 $A \Rightarrow aAbc \mid \lambda$



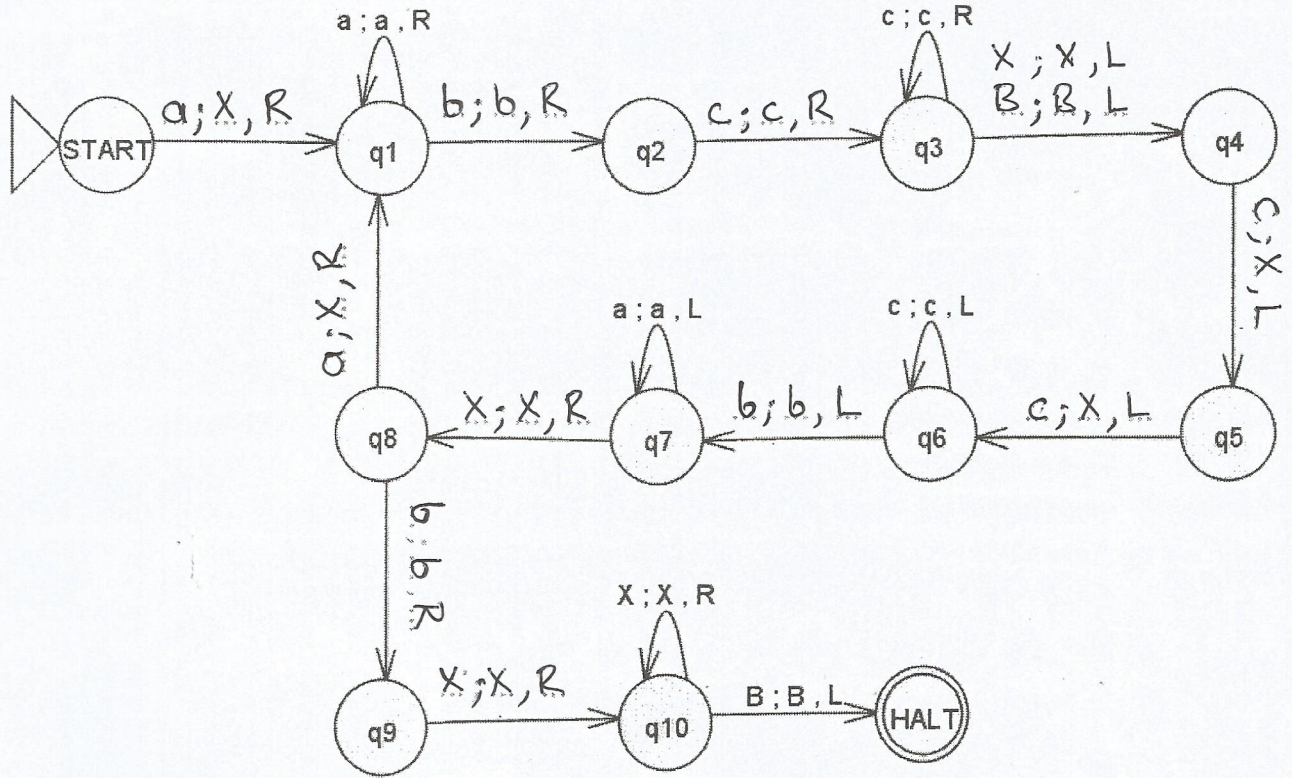
S3) Q3) (25p.) L dili bir TM tasarlayınız. (Construct a TM for the language L.)

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



S4) Q4) (10p.) L dili verilen TM'de eksik bırakılan yerleri aşağıdaki örnekte olduğu gibi HALT edecek şekilde tamamlayınız. (Complete the blanks in the given TM as halting a given string att the following example.)

$$L = \{a^n b c^{2n} \mid n \geq 1\}$$



a a a b c c c c c c B
X a a b c c c c X X B
X X a b c c X X X X B
X X X b X X X X X X B

^

HALT