

KBÜ BİLGİSAYAR MÜHENDİSLİĞİ BÖLÜMÜ
BLM323 OTOMATA TEORİSİ
FİNAL SINAV SORULARI

S1) Aşağıdaki CFG'yi CNF'a dönüştürünüz. Tüm adımları gösteriniz. (30 p.)

Q1) Convert the following CFG into CNF. Show all steps during conversion. (30 p.)

$S \rightarrow aS \mid X$
 $X \rightarrow bXc \mid \lambda$

① $S_0 \rightarrow S$
 $S \rightarrow aS \mid X$
 $X \rightarrow bXc \mid \lambda$

② $X \rightarrow \lambda$ $S \rightarrow \lambda$
 $S_0 \rightarrow S$ $S_0 \rightarrow S \mid \lambda$
 $S \rightarrow aS \mid X \mid \lambda$ $S \rightarrow aS \mid X \mid a$
 $X \rightarrow bXc \mid bc$ $X \rightarrow bXc \mid bc$

③ $S \rightarrow X$
 $S_0 \rightarrow S \mid \lambda$
 $S \rightarrow aS \mid bXc \mid bc \mid a$
 $X \rightarrow bXc \mid bc$

$S_0 \rightarrow S$

$S_0 \rightarrow aS \mid bXc \mid bc \mid a \mid \lambda$
 $S \rightarrow aS \mid bXc \mid bc \mid a$
 $X \rightarrow bXc \mid bc$

④ $S_0 \rightarrow AS \mid YC \mid BC \mid a \mid \lambda$
 $S \rightarrow AS \mid YC \mid BC \mid a$
 $X \rightarrow YC \mid BC$
 $Y \rightarrow BX$
 $A \rightarrow a$
 $B \rightarrow b$
 $C \rightarrow c$

KBU DEPARTMENT OF COMPUTER ENGINEERING
CME323 AUTOMATA THEORY
FINAL EXAM QUESTIONS

S2) Aşağıdaki L dilinin düzenli olmadığını ispatlayınız. (10 p.)
Q2) Prove that the following language L is not regular. (10 p.)

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

$x = uvw$

$a \dots a \dots ab \dots b$
 $u \quad v \quad w$

$u = a^s \quad v = a^t \quad w = a^r b^q$

$m = n+1$ olsun.

$a^{n+1} b^n \in L$

$s+t+r = n+1$ $q = n$

$s+t+r > q$

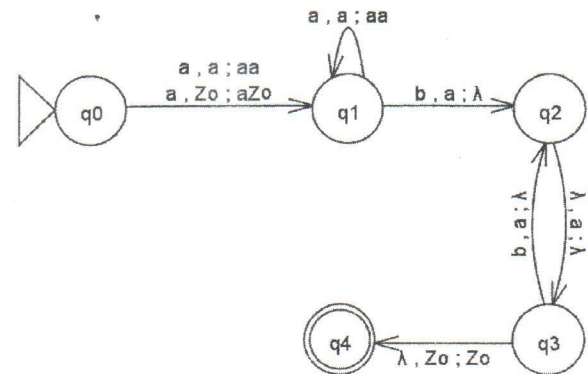
$\epsilon = 0$

$a^{n+1-t} b^n \notin L$

L düzenli değildir.

S3) Aşağıdaki PDA'nın tanıdığı dilin tanımını yapınız. (10 p.)

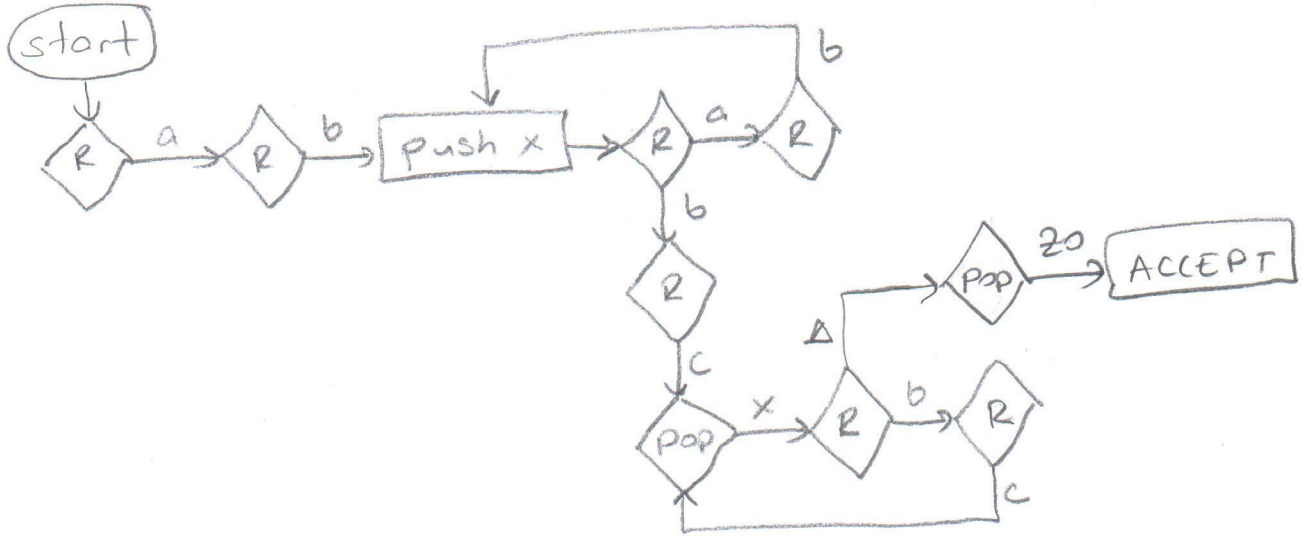
Q3) Define a language that accept by the following PDA. (10 p.)



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

S4) Aşağıdaki dile ait CFG'yi yazınız. L dilini tanıyan bir PDA (flowchart) tasarlayınız. Q4) Write a CFG for the following language L. Construct a PDA for the language L. (30 p.) $L = \{ (ab)^m (bc)^n \mid m > 0, n > 0, m = n \}$

$$S \rightarrow abSbc \mid abbc$$



S5) Aşağıdaki dili tanıyan TM'yi tasarlayınız. Q5) Construct a TM for the following language. (30 p.)

$$L = \{ a^i b^j c^k \mid i > 0, j > 0, k > 0, i > j > k \}$$

