



National University of Modern Languages, Islamabad

Faculty of Engineering & Computer Science

Department of Computer Science

Second Quiz

BS CS (6 A/B) Morning-Fall-2022

Automata Theory

Faculty Name: Farhad Muhammad Riaz

Maximum Time Allowed: 20 minutes

Maximum Points: 05

Name: _____

Instruction:

- Please don't write unnecessary information, be specific.
- Write your answer within the space you provide.

QNO1. Remove the unit Production from the Grammar bellow

[02]

$S \rightarrow a|aA|B|C$

$A \rightarrow aB|\lambda$

$B \rightarrow Aa$

$C \rightarrow cCD$

$D \rightarrow ddd$

We have two unit production: B and C so the production 1 become S produced a/aA/Aa/cCD

QNO2. Consider the grammar

[03]

$S \rightarrow SAB | \lambda$

$A \rightarrow aA | a$

$B \rightarrow bB | \lambda$

- For string **aabaaabb** prove the grammar is ambiguous
- Remove the ambiguity
 - USE CNF to Remove the ambiguity**
- Draw the regular Expression of the above language



National University of Modern Languages, Islamabad

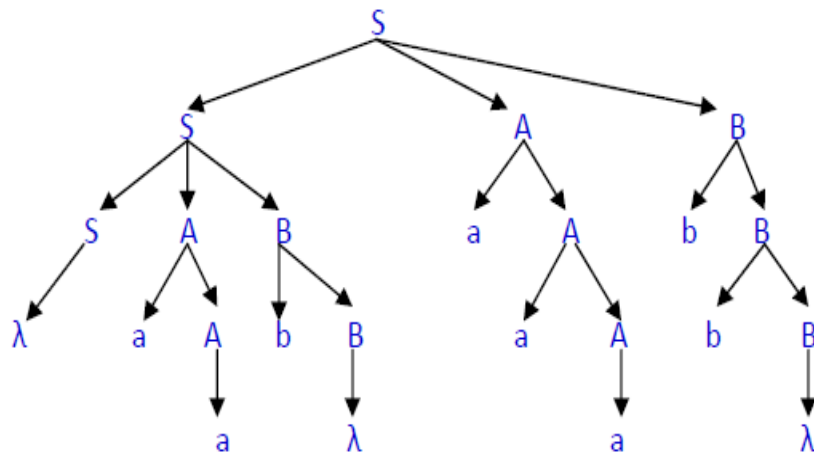
Faculty of Engineering & Computer Science

Department of Computer Science

a) Give a leftmost derivation of aabaaabb.

$S \Rightarrow SAB \Rightarrow SABAB \Rightarrow \lambda ABAB \Rightarrow \lambda aABAB \Rightarrow \lambda aabBAB$
 $\Rightarrow \lambda aab\lambda AB \Rightarrow \lambda aab\lambda aAB \Rightarrow \lambda aab\lambda aaAB \Rightarrow \lambda aab\lambda aaaB \Rightarrow \lambda aab\lambda aaabB$
 $\Rightarrow \lambda aab\lambda aaabbB \Rightarrow \lambda aab\lambda aaabb\lambda \Rightarrow aabaaabb$

b) Draw the derivation tree:



c) Give a regular expression for L(G). $(a^*ab^*)^*$