



Yashoda Technical Campus, Satara

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Faculty of Engineering
Department of Computer Science and Engineering

Subject:- Theory of Computation Tutorial Question Class-TY CSE

Tutorial No.1

Sr. No.	Question	
1	Differentiate between the Deterministics finite autamata & Non-Deterministics finite autamata.	
2	Design the DFA for Even number of a's & Even number of b's Odd number of a's & Even number of b's Even number of a's & Odd number of b's Odd number of a's & Odd number of b's Also write down 4 more examples of DFA design.	
3	Construct the NFA for all language in which second last bit is 1. Also write down 4 more examples of NFA design.	
4	Explain Mealy & Moore Machine with example. Solve examples to Convert Mealy machine into its equivalent Moore machine & Moore machine to Mealy machine.	
5	Convert NFA to DFA, Convert NFA with null to NFA.	
6	Write down the pumping lemma theorem with example.	

Tutorial No.2

Sr. No.	Question	
1	Explain the Chomsky Hierarchy classification of grammars	
2	Consider the grammar given as $G = (\{S, A\}, \{a, b\}, P, S)$ Where production P consists of, $S \rightarrow aAS \mid a$ $A \rightarrow SbA \mid SS \mid ba$ Find a) Leftmost derivation b) Rightmost derivation c) Parse tree for the string "aabbba".	
3	Eliminate NULL production from the grammar G given below: $S \rightarrow a / Xb / aYa$ $X \rightarrow Y / \epsilon$ $Y \rightarrow b / X$ Write the productions after elimination	

Vision of department: To lead in technical, quality education, innovation, research for development of sustainable & inclusive technology for the society.

Mission of department: 1. To create ambience of academic excellence through state of art infrastructure. 2. To create student-centric pedagogy that will lead to employability. 3. To create a software engineering professional with knowledge of multidisciplinary fields, can provide innovative products & service to society. 4. To train and motivate the students for lifelong learning, employability, and entrepreneurship.



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4	Illustrate the different ways of simplification of Grammar. Eliminate Unit production from the grammar G given below: $S \rightarrow Aa/B$ $B \rightarrow A/bb$ $A \rightarrow a/bc/B$ Write the productions after elimination	
5	Consider production of grammar $G=(N, T, P, S)$, $S \rightarrow S+S/S^*S/a/b$ generate string $a+a*b$ Compute a) Leftmost derivation b) Rightmost derivation c) Parse tree for the string " $a+a*b$ ".	
6	Define the terms a) Leftmost derivation b) Rightmost derivation c) Parse tree d) Leftmost derivation tree e) Rightmost derivation tree f) Context free grammar g) Regular Grammar	

Tutorial No.3

Sr. No.	Question	
1	Explain the linear or regular grammar Also explain types of linear grammar	
2	Convert the following Right Linear Grammar into Left linear grammar. 1. $S \rightarrow bA$ $A \rightarrow aA/bB/b$ $B \rightarrow bA$ 2. $S \rightarrow bB$ $B \rightarrow bC$ $B \rightarrow aB$ $B \rightarrow b$ $C \rightarrow a$	
3	Write the steps for converting LLG into RLG. Convert the following Left Linear Grammar into Right linear grammar. 1. $S \rightarrow Aa/Bb$ $A \rightarrow Bb$ $B \rightarrow Ba/b$	
4	Explain the Chomsky's Normal form & Greibach Normal form with example	
5	Convert the CFG into Chomsky's Normal Form 1. $S \rightarrow ABA$ $A \rightarrow aA/\epsilon$ $B \rightarrow bB/\epsilon$ 2. Convert the following CFG to CNF: $S \rightarrow aSa bSb a b aa bb$	
6	How to convert the CFG into Greibach Normal Form (Write steps) And Convert given grammar into GNF $S \rightarrow CA/BB$ $B \rightarrow b/SB$ $C \rightarrow b$ $A \rightarrow a$	
7	Check whether the given grammar is ambiguous or not- 1. $S \rightarrow a / abSb / aAb$ $A \rightarrow bS / aAAb$ 2. Show that the given grammar is ambiguous grammar. $E \rightarrow E+E$ $E \rightarrow E * E$ $E \rightarrow a$	

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Tutorial No.4

Sr. No.	Question	
1	Explain the Push Down Automata with example & different types of Push Down Automata.	
2	Differentiate between the Deterministic & Non-Deterministic Push Down Automata	
3	Explain the main components of Push Down Automata	
4	Construct the PDA for the language 1. $L=a^n b^n$, 2. $L=a^n b^{2n}$ 3. $L=a^{2n} b^n$ 4. $L=a^n b^m$ 5. WW^R even length palindrome 6. WCW^R odd length palindrome 7. $a^n b^m c^n$	
5	Explain the relative powers of DPDA & NPDA.	

Tutorial No.5

Sr. No.	Question	
1	Design the turing machine for A) equal no of a's & b's. B) $a^n b^n c^n$ or $0^n 1^n 2^n$ where $n \geq 1$	
2	Design the turing machine for which recognizes palindromes over a,b	
3	Design the turing machine for to find the one's complement of binary number.	
4	Explain the Halting problem of turing machine with neat diagram	
5	Explain the church's turing hypothesis.	
6	Explain the variants of turing machine also explain turing machine with stay options.	
7	Explain the Universal Turing Machine in detail.	

Subject Teacher

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