# MAY 2022:

Differentiate between Moore machine and Mealy machine.

What do you mean by ambiguous grammar? Prove that the following grammar is ambiguous.

Distinguish between NFA and DFA

What is Halting problem? Explain with example.

What is a regular expression? Design DFA corresponding to the regular expression: (0+1)* 101 (0+1)

Define the structure of Push Down Automata (PDA). Explain the power and limitations of PDA.

Design PDA to accept language L = {a^nb^2n I n >= 1}.

Define CFG. Design a CFG for the language L = { on 1 2n I n 0 }.

Find the leftmost derivation, rightmost derivation and parse trees for the string aaabbabbba using CFG:

S → aB / bA

A → aS / bAA / a

B → bS / aBB/ b

Describe Chomsky Normal Form (CNF). Convert the following CFG to CNF

S → aAbB

A → Ab / b

B → Ba / a

Explain Greibach Normal Form (GNF) Convert the following CFG to GNF

S → XY

X → 0X / IY / I

Y → 1

What is a Turing Machine (TM) ? Explain the working of TM with a neat sketch. Also describe the variants of TM

Design a TM to accept (a^n b^n c^n). Can a DFA be designed for the same? Justify.

Application of FA, CFG, PDA and TM

Chomsky Hierarchy

Right Linear and Left Linear Grammars

Phases of Compiler

Reduced DFA

# MAY 2023:

Describe Moore machine with all tuples in detail.

Arrange a mealy machine to accept all strings ending with 00 or 11.

Design DFA to accept strings over the alphabet ∑ = {a,b} containing even number of a's.

Evaluate given context-free grammar and Identify whether it is ambiguous or not.

S a | Sa | bSS | SSb | SbS

Draw diagram for Chomsky hierarchy and Show all the types with proper explanation.

Design NFA for accepting input strings that contain either the keyword 000 or the keyword 010 and convert it into an equivalent DFA

Design a DFA corresponding to regular expression

(a+b)*aba (a+b)*

Design a Mealy machine that accepts strings ending in “00” and “11”. Convert the same to Moore Machine

Define CFG, obtain CFG for the following grammar: (110+11)*(10)*

Construct a Turing machine accepting palindromes over ∑={a,b}

Design a PDA for L = { a n b n | n>= 1}

Design a Moore machine which counts the occurrence of substring bba in input string.

Design a TM accepting the set of strings with equal number of 0’s and 1’s over {0,1}*

Write Short note on: Halting Problem in TM.

Explain applications of FM, PDA and Turing Machine with examples

# DEC 2023:

Define the following terms and give an example of each:

- Automata
- String
- Language
- Alphabet
- Grammar

What are the limitations of Finite Automata?

What do you mean by ambiguous grammar?

Design Turing Machine to add two unary numbers.

Describe the language of the following regular expressions as concisely as possible.

- 1(0+1)*0
- (aa)*(bb)*(b)
- (ab+ba)*
- (A-Z) (a-z) *(a+e+i+o+u)
- (a-z) (a-z | 0-9)*

Write down the regular expression for the following language.

- L is a language for all strings over {0,1} having an odd number of 1s and any number of 0s.
- L is language for all strings over {0,1} having number of 10 or 11

What is a compiler? Describe the different phases of a compiler.

Design Push Down Automata (PD for the language L={anba2n|n≥0}

What do you mean by Deterministic Finite Automata (DF?

Design DFA for the language defined over ∑{0, 1} and consists of the

strings ending with 10.

Consider the grammar S → 0S0 | 1S1 | SS | λ.

Given the string 0101101110, find a leftmost and rightmost derivations with corresponding parse trees

What are Moore and Mealy machines. Design Moore and Mealy machines to convert each occurrence of ‘abb’ with ‘ab’

Convert the following grammar into Chomsky Normal Form (CNF)

S → a | aA | B

A → aBB | ε

B → Aa | b

Design a Turing Machine to accept the language L = {am bm : m>=1}

Variants of TM

Chomsky hierarchy

Power and Limitations of PDA.

Halting Problem

Regular Expressions

# MAY 2024:

Describe Moore machine with all tuples in detail. (05)

Find the Regular Expression corresponding to the grammar

S → AB / AS

A → a / aA

B → b

Construct mealy machine to accept all strings ending with 00 or 11.

Write a note on Universal Turing Machin(05)

Draw diagram for Chomsky hierarchy and Show all the types with proper explanation.

Design NFA for accepting input strings that contain either the keyword 000 or the keyword 010 and convert it into an equivalent DFA .

Design a DFA corresponding to regular expression (a+b)*aba (a+b)*

What are Moore and Mealy machines?

Design a Moore and Mealy machines to convert all occurrences of '1110' to '1011' over Σ {0, 1}.

Define CFG, obtain CFG for the following grammar (110+11)*(10)*

Construct a Turing machine accepting palindromes over ∑={a,b} (10)

Discuss power and limitations of PDA Compare it with FA and TM

Define CFG.

Find the leftmost derivation, rightmost derivation and parse trees for the string " aaabbabbba" using CFG:

S → aB / bA

A → aS / bAA / a

B → bS / aBB / b

Construct NFA for Binary strings that begin with 11 and end with 11 or begin with 00 and end with 00

Halting Problem in TM

Greibach Normal Form (GNF)

Applications of FM, PDA and Turing Machine with example