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# LNCT UNIVERSITY, BHOPAL

Enrollment No.

## CS- 303
## B.TECH (CS) III SEMESTER EXAMINATION [DECEMBER-2024]
## TOC

***Maximum Marks:*** 70 **Time Allowed: 3Hours**

***Note:-*** **Attempt all questions. Internal choice is given.**

**(SECTION –A)**

**1. Short Answer Type Questions (Attempt Any Five) [5x6=30]**

i. Construct DFA that will recognize all string of set{ 0,1} and ended with 011.

ii. Explain DFA and NFA with Example?

iii. Differentiate Mealy machine and Moore machine with diagram?

iv. Construct finite state machine for given Regular Expression?
i. (1+10)*(101+1)* ii. (0*+1*)

v. What is meant by Ambiguous Grammar? Test whether the grammar ambiguous or not. String to be generated "a(a)aa".
A-> AA
A->(A)
A->a

vi. Convert the following grammar into Greibach Normal Form.
S->ABA
A-> aA| ε
B->bB| ε

vii. Construct DFA for given NFA Parameter?
{(P,Q,R,S),(0,1), &,(P),(S)}

| & | 0 | 1 |
|---|---|---|
| P | P, Q | P |
| Q | R | R |
| R | S | - |
| S | S | S |

**(SECTION –B)**

**2. Long Answer Type Questions (Attempt Any Four) [4x10=40]**

i. State pumping lemma for context free languages.

ii. Obtain the *left and right derivation* for a string w=001122 for the *production rules* S->AB.A->01|0A1,B->2B|ε.

iii. Define Turing Machine? Explain types of Turing Machine.

iv. Design a Turing machine for the language over {0.1} containing strings. with equal number of 0's and 1's.

v. Explain the block diagram of PDA with its components Specification, language and transition table with example.

vi. Construct/Design Push Down Automata for the language $L = WCW^R \mid W \in (0+1)^*$ where $W^R$ is reverse string and C is input symbol

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