



ACE

Engineering College

(NBA ACCREDITED B.TECH COURSES & NAAC "A" GRADE)

An Autonomous Institution

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

III B.Tech I Semester Regular(R18) (2020-21)

Sub:FLAT

ASSIGNMENT 1:

Prove that DFA and NFA are equivalent in power?

2. Define Chomsky Normal Form. Also convert the following CFG to Chomsky Normal Form

$S \rightarrow bA \mid Ab$

$A \rightarrow bAA \mid aS \mid a$

$B \rightarrow aBB \mid bS \mid b$

3. State pumping lemma and prove that the set $\{a^n b^n / n \geq 1\}$ is not regular.

4. Define the following with example

a) Grammar b) Regular expression c) DFA d) NFA e) Epsilon Closure

5. Construct the FA for the following regular expressions

a) $(0+1)(00+11)(0+1)^*$

b) $(0+1)^* 111$

6. Explain about Chomsky Hierarchy?

7. Convert the following grammar into Chomsky Normal Form.

$S \rightarrow S_1 \mid S_2$

$S_1 \rightarrow S_1 b \mid Ab \mid \epsilon$

$A \rightarrow aAb \mid ab$

$S_2 \rightarrow S_2 a \mid Ba \mid \epsilon$

$B \rightarrow bBa \mid ba$

ASSIGNMENT 2:

1. Define the following

- (a) PDA
- (b) Recursive Languages
- (c) Recursively Enumerable Languages
- (d) Turing Machine
- (e) Decidable Language

2. Prove that the language $L = \{a^n b^n c^n / n \geq 1\}$ is not context free using Pumping Lemma.

3. Explain about Post Correspondence and Modified Post Correspondence Problems with examples.

4. Design a Turing Machine over $\Sigma = \{a, b\}$ to accept the language

$$L = \{ww^R / w \in (a, b)^*\}$$

5. Design a Turing Machine over $\Sigma = \{a, b\}$ to accept the language

$$L = \{wcw^R / w \in (a, b)^*\}$$

6. Explain the closure properties of Context Free Languages.

7. Convert the following PDA to CFG.

$$\text{PDA} = (\{q_0, q_1\}, \{0, 1\}, \{x, z_0\}, \delta, q_0, z_0)$$

□ is defined as

$$d(q_0, 1, z_0) = (q_0, xz_0)$$

$$d(q_0, 1, x) = (q_0, xx)$$

$$d(q_0, 0, x) = (q_0, x)$$

$$d(q_0, e, x) = (q_1, e)$$

$$d(q_1, e, x) = (q_1, e)$$

$$d(q_1, 0, x) = (q_1, xx)$$

$$d(q_1, 0, z_0) = (q_1, e)$$

