

Unit:-3

1. Consider the CFG with $\{S,A,B\}$ as the non-terminal alphabet $\{a,b\}$ as the terminal alphabet . S as the start symbol and the following set of production rules.

$$S \rightarrow ASA \mid aB \mid b$$

$$A \rightarrow B$$

$$B \rightarrow b \mid \varepsilon$$

Find the reduced grammar?

2. Define CFG .State and explain the closure properties of CFG.
3. Consider the CFG with $\{S,A,B\}$ as the non-terminal alphabet $\{a,b\}$ as the terminal alphabet . S as the start symbol and the following set of production rules.

$$S \rightarrow ab \mid bA$$

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

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

Find it is ambiguous or unambiguous grammar?

4. Obtain GNF for the CFG

$$S \rightarrow AB$$

$$A \rightarrow BS \mid b$$

$$B \rightarrow SA \mid a$$

5. Define Grammar? Explain about Chomsky classification of grammar?
6. State pumping lemma for Context free languages. Prove that $L = \{0^n 1^n 2^n \mid n \geq 1\}$ is not a CFG.