

K.D.K. COLLEGE OF ENGINEERING
DEPARTMENT OF INFORMATION TECHNOLOGY
SUBJECT- THEORY OF COMPUTATION
Assignment 4

1. Show that function $f(x,y)=x*y$ and $f(x,y)=xy$ is primitive recursive function
2. Consider the Grammar with Productions
 $S \rightarrow aAB,$
 $A \rightarrow bBb,$
 $B \rightarrow A | \epsilon$
Draw leftmost derivation tree of above given grammar
3. Show that the grammar $S \rightarrow aB+ab, A \rightarrow aAB | a, B \rightarrow ABb | b$ is ambiguous
4. Find a Grammar in Chomsky Normal form equivalent to
 $S \rightarrow aAbB$
 $A \rightarrow qA | q$
 $B \rightarrow bB | b$
5. Find the grammar in CNF
 $S \rightarrow -S, S \rightarrow [S@S], S \rightarrow a, S \rightarrow b$
6. What are the Steps for converting right linear grammar to equivalent left-linear grammar?
Convert the following right-linear grammar to equivalent left-linear grammar:
 $S \rightarrow 1B$
 $B \rightarrow 1C$
 $B \rightarrow 0B$
 $B \rightarrow 1$
 $C \rightarrow 0$
7. Design a PDA to accept the language $L = \{ WcW^R \mid W \in \{a,b\}^* \}$
8. Design a T.M to accept the language $L = \{ a^n b^n \mid n > 0 \}$
9. What are the different types of Turing Machine with neat diagram (Any six)