1. Eliminate left recursion in the following grammar (Remove direct & Indirect recursion)

$S \rightarrow Aa \mid b \quad A \rightarrow Ac \mid Sd \mid \epsilon$

2. For a given grammar below, construct an operator precedence relation matrix assuming * + are binary operators and id as terminal symbol and E as non terminal

$E \rightarrow E + E \quad E \rightarrow E * E \quad E \rightarrow id$

Parse the input id + id * id

3. Find First and follow set for given grammar below

$E \rightarrow TE' \quad E' \rightarrow +TE' \mid \epsilon$

$T \rightarrow FT' \quad T' \rightarrow *FT' \mid \epsilon$

$F \rightarrow (E) \quad F \rightarrow id$

4. For the following grammar construct LL(1) Parser Table

$S \rightarrow F \quad S \rightarrow (S-F) \quad F \rightarrow a$

Parse the string ((a-a) show the contents of stack and input buffer

5. Illustrate compiler internal representation of source program for the following statement after each phase

Position = initial + rate * 60

4) construct SLR parsing table for following grammar. Show how the parsing actions are done for the input string ()()$ Show stack content, input buffer action

~~$S \rightarrow (S)(S)$~~

$S \rightarrow (S)S$

$S \rightarrow \epsilon$

5) What do you mean by operator precedence grammar? With help of following given grammar, parse the input string "a+b*c*d"

$E \rightarrow E+T|T$

$T \rightarrow T*V|V$

$V \rightarrow a|b|c|d$

5) Construct LL(1) parsing table for the following grammar

$S \rightarrow aBDh$

$B \rightarrow cC$

$C \rightarrow bC|\epsilon$

$D \rightarrow EF$

$E \rightarrow g|\epsilon$

$F \rightarrow f|\epsilon$

Check the i/p string acbgh

6) consider the following grammar

$S \rightarrow (A) \mid 0$

$A \rightarrow SB$

$B \rightarrow , SB \mid \epsilon$

Is above grammar LL(1). Justify

7) For the following grammar, construct LR(0) parser table

$S \rightarrow aCDe$

$C \rightarrow Cbc$

$C \rightarrow b$

$D \rightarrow d$

Parse the i/p string abbcbcde

8) construct LR(0) Parser table for the following grammar

$S \rightarrow (L) \mid id$

$L \rightarrow S \mid L, S$

Variable: S and L

Terminals: (id ,)

9) construct predictive parser table

$E \rightarrow TE'$

$E' \rightarrow +TE' \mid \epsilon$

$T \rightarrow FT'$

$T' \rightarrow *FT' \mid \epsilon$

$F \rightarrow (E) \mid id$

10) find FIRST & FOLLOW for the following grammar

$S \rightarrow Aa$
$A \rightarrow BD$
$B \rightarrow b \mid \epsilon$
$D \rightarrow d \mid \epsilon$

11) Eliminate left recursion from the following

$S \rightarrow (L) \mid x$
$L \rightarrow L,S \mid S$

12) find FIRST & FOLLOW

$S \rightarrow Bb \mid Dd$
$B \rightarrow aB \mid \epsilon$
$D \rightarrow cD \mid \epsilon$