5. (a) Show that following grammar is LL(1). Also define FIRST and FOLLOW procedure : 10 Marks (CO1 & CO2)

$S \rightarrow AaAb|BbBa$

$A \rightarrow \varepsilon$

$B \rightarrow \varepsilon$

OR

(b) Consider the following grammar : 10 Marks (CO1 & CO2)

$S \rightarrow (L)|a$

$L \rightarrow L, S|S$

(i) What are the terminals, non-terminals and start symbol ?

(ii) Find parse tree for the following sentences :

(1) (a, a)

(2) (a, (a, a))

(3) (a, ((a, a), (a, a)))

Also construct the leftmost and rightmost derivation for (b).

(iii) What language does the grammar generate ?

H Roll No. .....

TMC–402

M. C. A. (FOURTH SEMESTER)

MID SEMESTER EXAMINATION, 2021

COMPILER DESIGN

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any ***one*** of the sub-questions.

(ii) Each question carries 10 marks.

1. (a) (i) What are the cousins of compiler ?

(ii) Explain about the role of lexical analyzer ? Explain how lexical analyzer removes white spaces from a source file.

10 Marks (CO1, CO2 & CO3)

P. T. O.

OR

(b) Construct the LL(1) parsing table for the following grammar :

10 Marks (CO1, CO2 & CO3)

$S \rightarrow aB|aC|Sd|Se$

$B \rightarrow bBc|f$

$C \rightarrow g$

2. (a) Explain the working of all the phases of compiler by taking one example.

10 Marks (CO1, CO2 & CO3)

OR

(b) Explain recursive descent parser. Construct a recursive descent parser for the following grammar :

10 Marks (CO1, CO2 & CO3)

$E \rightarrow aT$

$T \rightarrow aT|\varepsilon$

3. (a) (i) Show that following is ambiguous :

$S \rightarrow aSbS$

$S \rightarrow bSaS|\varepsilon$

(ii) Define the following functions :

yylex(); yywrap(), yyin() and yyleng()

10 Marks (CO1 & CO2)

OR

(b) (i) Explain, why it is better to have two passes in compiler than having one pass.

(ii) What is the use of symbol table in the process of compilation ?

10 Marks (CO1 & CO2)

4. (a) (i) Explain the types of compiler and also explain their features.

(ii) Compute the total number of tokens generated for the following code :

10 Marks (CO1 & CO2)

(1) scanf("%d%d", &a. &b);

(2) int a[i];

(3) int a[5][6];

OR

(b) What are the necessary to be carries but before the construction of predictive parsing ? Explain through a suitable example. 10 Marks (CO1 & CO2)