

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)

Department of Computer Science and Engineering (CSE)

MID SEMESTER EXAMINATION

DURATION: 1 Hour 30 Minutes

SUMMER SEMESTER, 2015-2016

FULL MARKS: 75

CSE 4801: Compiler Design

Programmable calculators are not allowed. Do not write anything on the question paper.

There are 4 (four) questions. Answer any 3 (three) of them.

Figures in the right margin indicate marks.

- Write down the names and functions of various phases/parts of a compiler. 10
- Discuss the roll of lexical analyzer in a compiler. What are the benefits of implementing lexical analyzer as a separate layer? 10
- What are the cousins of a compiler? What are their uses? 5

- In PASCAL programing language variables can be declare as per following format:- 10

$var_1, var_2, var_3, \dots, var_n : data_type$

Common data type keywords in PASCAL are *integer*, *character*, and *real*.

Design a grammar to recognize multiline of variable declarations in PASCAL format.

- Explain various types of syntax errors and their recovery strategies. 10
- Compare LR and LL parsers in detail. 5

- When is the elimination of left recursion from a grammar necessary? How this can be achieved? 5

- Find sets of *First* and *Follow* for all of the non-terminals in the following grammar. 10
- Consider that the set of *First* and *Follow* will be used to build the predictive parse table for the grammar. Make changes in the grammar if necessary.

$A \rightarrow A - B \mid B$

$B \rightarrow B * C \mid C$

$C \rightarrow -A \mid (A) \mid id \mid num$

- Construct LR(1) collection of items for the following grammar- 10
- $A \rightarrow BC$
 $B \rightarrow bC$
 $C \rightarrow dC \mid b$

4. a) A grammar G and its LR(0) states and transitions are given below. Build the SLR parse table accordingly.

Grammar G:

0: $S' \rightarrow SS$

1: $S \rightarrow (L)$

2: $S \rightarrow x$

3: $L \rightarrow S$

4: $L \rightarrow L, S$

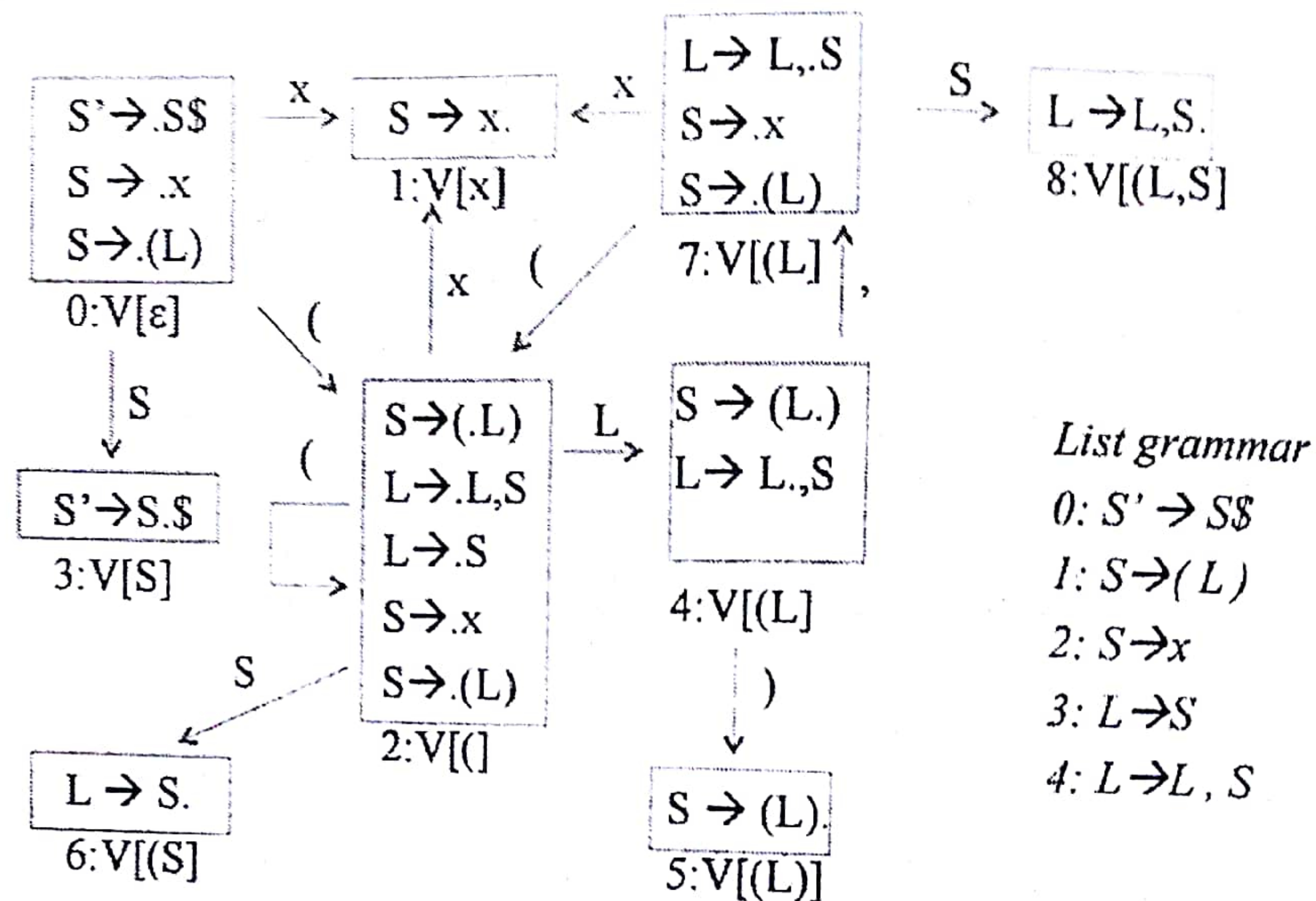


Figure 1: LR(0) states and transitions

- b) Show the SLR parsing steps for the input $(x,(x))\$$ with respect to grammar and parse table derived from question 4(a).