

--	--	--	--	--	--	--	--	--	--

Sixth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Compiler Design

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
atleast TWO questions from each part.**

PART – A

- 1 a. Explain the various phases of a compiler. Show the translation for an assignment statement.
 $c = a + b * 120;$
Clearly indicate the output of each phase. (12 Marks)
- b. Define regular expression definition. Write a regular expression for unsigned numbers. Also write the transition algorithm. (08 Marks)
- 2 a. What is left recursion and left factoring? Explain with suitable example. (06 Marks)
- b. For the following grammar :
 $E \rightarrow TE'$
 $E' \rightarrow +TE'/E$
 $T \rightarrow FT'$
 $T' \rightarrow * FT'/E$
 $F \rightarrow (E)/id$
 Perform predictive LL(1) parser and also parse the input string $id + id * id$. (14 Marks)
- 3 a. What is handle pruning? How they are used in the STACK implantation of shift reduce parser? Explain with the grammar.
 $E \rightarrow E + E / E * E / (E)/id$
 On the input string $w = id_1 + id_2 * id_3$. (06 Marks)
- b. Construct SLR(1) parsing table for the following grammar G.
 $S \rightarrow L = R$
 $S \rightarrow R$
 $L \rightarrow *R$
 $L \rightarrow id$
 $R \rightarrow L$
 Is this grammar SLR(1)? Justify your answer. (14 Marks)
- 4 a. Compare the relative merits and demerits of LALR, SLR and LR(1). (06 Marks)
- b. Write the algorithm for constructing a canonical sets of LR(1) items for grammar G. Apply the above algorithm to compute the canonical sets of LR(1) items for the following grammar.
 $S \rightarrow CC$
 $C \rightarrow eC/d$. (14 Marks)

PART – B

- 5 a. Define synthesized and inherited attributes. Give examples for each. (08 Marks)
- b. For the SDD given below, construct annotated parse tree for the input :
 Float a, b, c
 $D \rightarrow TL;$
 $T \rightarrow int/float;$
 $L \rightarrow L, id/id$. (12 Marks)

- 6 a. Define DAG. construct a DAG for the expression :
 $a + a * (b - c) + (b - c) * d.$ (06 Marks)
- b. What are three address code? Discuss its quadruples, triples and indirect triples representations. (06 Marks)
- c. Consider the assignment statement :
 $a = b * - c + b * - c$
Write the sequence of three address codes and give its quadruple, triple and indirect triple representations. (08 Marks)
- 7 a. Explain in detail the different storage allocation strategies. (08 Marks)
- b. Write a short note on the following terms :
i) Garbage collection
ii) Activation tree and activation record
iii) Displays. (12 Marks)
- 8 a. Discuss the various issues in the design of a code generator. (12 Marks)
- b. Mention the different types of optimization of basic blocks. Explain any two with example. (08 Marks)
