

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

Sixth Semester B.E. Degree Examination, June/July 2013

Compiler Design

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1
 - a. Explain three types of software productivity tools. (06 Marks)
 - b. Define sentinels. Give lookahead code with sentinels. (04 Marks)
 - c. Enlist algebraic laws for regular expressions. (07 Marks)
 - d. Give transition diagram for unsigned numbers. (03 Marks)

- 2
 - a. Write an algorithm to eliminate left recursion from a grammar, also give the syntax of the production. (05 Marks)
 - b. Consider the production:

$$S \rightarrow aAb$$

$$A \rightarrow cd/C.$$
 Show that recursive-descent parsing fails for the input string "acdb", also explain recursive descent algorithm. (07 Marks)
 - c. Find First and Follow for the given grammars:
 - i) $\text{stmt_sequence} \rightarrow \text{stmt stmt_sequence}'$
 $\text{stmt_sequence}' \rightarrow ; \text{stmt_sequence} / \epsilon$
 $\text{stmt} \rightarrow s$
 - ii) $S \rightarrow ,GH;$
 $G \rightarrow aF$
 $F \rightarrow bF / \epsilon$
 $H \rightarrow KL$
 $K \rightarrow m / \epsilon$
 $L \rightarrow n / \epsilon$
 (08 Marks)

- 3
 - a. What are two types of conflicts during shift reduce parsing? Give examples. (04 Marks)
 - b. For the given grammar $E \rightarrow E + n/n$. Construct parsing table of LL(1). Verify $3 + 4 + 5$ and show each step of verification with reference to parsing table. (08 Marks)
 - c. How to verify whether grammar is LL(1) or not? Show that:

$$S \rightarrow AaAb/BbBa$$

$$A \rightarrow \epsilon$$

$$B \rightarrow \epsilon$$
 is LL (1), without constructing any table. (08 Marks)

- 4
 - a. Construct the DFA of LR(0) items and SLR parsing table for the grammar:

$$\text{Stmt_sequence} \rightarrow \text{stmt_sequence}; \text{stmt}/\text{stmt}$$

$$\text{Stmt} \rightarrow S$$
 Identify Kernel and non Kernal items in state I_4 . (12 Marks)
 - b. Discuss the behaviour of the LR parser. (04 Marks)
 - c. For the grammar $A \rightarrow (A)/a$, construct LR(1) set of items. (04 Marks)

PART – B

- 5 a. Write annotated parse tree for $3*5 + 4n$ using Top down approach. Write semantic rules for each step. (08 Marks)
- b. Discuss S-attributes and L-attributes with respect to SDD (Syntax Directed Definition). (04 Marks)
- c. By considering an array type `int[3][3]`, write syntax directed translation with semantic rules. (08 Marks)
- 6 a. Enlist any four common three address instruction forms. (04 Marks)
- b. Define quadruples, triples and static single assignment form. (06 Marks)
- c. Write syntax directed definition for flow of control statements. (10 Marks)
- 7 a. Write a version of quick sort, in ML style using the nested functions. Give any four additional features of ML. (08 Marks)
- b. “Most programs exhibit a high degree of locality”, explain the statement. (05 Marks)
- c. “Garbage collection is seldom used in real time applications”, justify the statement. How language design affects the characteristics of memory usage. (07 Marks)
- 8 a. How register allocation and evaluation order plays an important role in a code generation? Discuss. (06 Marks)
- b. Write an intermediate code to set a 10×10 matrix to an identity matrix. (10 Marks)
- c. Define flow graph. How it is constructed? (04 Marks)

stupidid.com