



1059  
B.E. (Computer Science and Engineering)  
Sixth Semester  
CS-604: Compiler Design

Time allowed: 3 Hours

Max. Marks: 50

**NOTE:** Attempt five questions in all, including Question No. 1 (Section-A) which is compulsory and selecting two questions each from Section B-C.

x-x-x

Section-A		
Q1.	a) Differentiate between shift-reduce and Operator Precedence Parsers. b) Why parsing is implemented as a separate phase? c) Differentiate synthesis and inherited attributes. Under what cases, inherited attributes are useful. d) How can we have conflicts in LR parsers? e) What is maximal munch rule?	10
Section-B		
Q2.	a) What is Lex. Write a Lex program to count the number of words and lines in a sample program. b) Explain the construction of LALR parsers from CLR parser. Is it always possible to do so? Justify your answer.	5 5
Q3.	a) Consider the below grammar. Can it be used for operator precedence parsing? If yes proceed with parsing of the string $id + id * id$ . If not, modify the grammar appropriately and do the parsing for the same string. $E \rightarrow EAE \mid id \quad A \rightarrow + \mid x$ b) Define YACC. Which is favored by YACC in case of shift-reduce and R-R conflict,?	6 4
Q4.	a) Show the parsing of the input string <b>int id,id;</b> using shift-reduce parser for the grammar $S \rightarrow TL; T \rightarrow int \mid float \mid L, id \mid id$ . Highlight handles and content of stack at each step. Assume suitable priority order. b) Is the below grammar suitable for predictive parsing. Justify $S \rightarrow FR \quad R \rightarrow S \mid \epsilon \quad F \rightarrow id$ .	7 3
Section-C		
Q5.	a) What is the purpose of code optimization? Explain in detail loop optimization with example. b) Generate three address code for the given expression:- $d = (a-b) + (a-c) + (a-c)$ Convert this three address code to a code sequence using code generation algorithm.	3 7
Q6.	a) Consider the following Syntax Directed Translation Scheme (SDTS), with non-terminals $\{E, T\}$ and terminals $\{x, y\}$ . $E \rightarrow xT \{ \text{print } 1 \} \quad E \rightarrow x \{ \text{print } 2 \} \quad T \rightarrow Ey \{ \text{print } 3 \}$ Write the output printed by a top down and bottom-up parser for the input <b>xyy</b> . b) Define symbol table. What are the contents of a symbol table? Explain in detail the symbol table organization for Block-Structured languages.	5 5
Q7.	a) What is Activation Record and Program Control Block? How are these useful in run time memory management? b) Write a short note on storage allocation strategies of compiler.	05 05