

This question paper contains 2 printed pages.]

Your Roll No.

1734

A

MCA / IV Sem.
MCA 401 - COMPILER DESIGN
(Admissions of 2009 and onwards)

Time : 2 Hours

Maximum Marks : 50

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

Attempt all questions.

Parts of a question must be answered together.

Make suitable assumptions where necessary and state them

1. Write a lex program that accepts as input a e-program and outputs the following lines of text in a file

No. of lines ***

No. of occurrences of int ***

No. of occurrences of operators ***

*** should be replaced by actual numbers as applicable to input file
the following operators:

+ - * / % < <= > >= = <> ! ^ -> • | &| | && ~ 5
[P.T.O.]

2. What are default rules for resolving passing action conflicts in yacc? What do you mean by precedence of a production? Illustrate with the help of suitable example how a user can enforce desired precedence for a production. 4
3. Write a yacc program that outputs three address code in the form of quadruples for a c-like program that includes arithmetic expressions, assignment statements, conditional and unconditional jumps, and while statement. 10
4. Consider the grammar
- $$S \rightarrow SS + | S S^* | a$$
- (a) Remove left recursion from above grammar. 3
- (b) Construct recursive descent parser for above grammar. 5
- (c) Construct predictive parser table for above grammar. 5
- (d) Construct LR (0) passing table for above grammar. 5
- (e) Construct LR (1) passing table for above grammar. 5
5. Give translation scheme for a sequence of declarations.
- (a) Hence determine the types and relative addresses for the identifiers in the sequence of declarations:
- ```
float x ;
record {float x ; float y;} p;
```
- 5
- (b) Identify and illustrate with suitable examples two ways of code improvement that can be applied to intermediate code. 3