

INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR

Date 3.10.2005 14.00 Time: 30 min.

Full Marks 20 No. of Students: 58

Autumn Semester:, 2005

Department: Computer Science and Engineering

Sub. No: CS 43001

3<sup>rd</sup> and 4<sup>th</sup> Yr. B. Tech.(Hons.)

Sub. Name: Compiler Construction

Name : ----- Roll No:-----

**Instructions :** Answer **all** the questions. Answer only what is asked. Do rough work in separate sheet of paper.

1. Given the grammar  $S' \rightarrow S$   
 $S \rightarrow aBc \mid bCe \mid aCd \mid bBd$   
 $B \rightarrow e$   
 $C \rightarrow e$   
Deduce the LR(1) sets of items. (5)

2. Consider the grammar  
 $E \rightarrow E + T$

$E \rightarrow T$

$T \rightarrow T * F$

$T \rightarrow F$

$F \rightarrow \text{id}$

Develop the semantic actions against each rule, such that we can generate the postfix version of an infix expression. (5)

3. Given the grammar

$S \rightarrow (L)a$

$L \rightarrow L,S \mid S$

show the handle of each right sentential form for the string  $(a,(a,a))$  (3)

4. Given the intermediate code

1. location = -1
2. i = 0
3. if i < 100 goto 5
4. goto 13
5.  $t_1 = 4 \times i$
6.  $t_2 = A[t_1]$
7. if  $t_2 = x$  goto 9
8. goto 10
9. location = i
10.  $t_3 = i + 1$
11.  $i = t_3$
12. goto 3
- 13.

Determine the Basic Blocks and draw the block flow diagram. (7)

Block No.	Statements

Block Flow Diagram : (Next page)