



Department of Library  
BNM Institute of Technology  
A.S.K, 2nd Stage, BANGALORE-16

CS664

### Sixth Semester B.E Degree Examination, Dec. 07 / Jan. 08 Compiler Design

Time: 3 hrs.

Max. Marks:100

**Note :** Answer any FIVE full questions.

1.
  - a. Explain the different phases of a compiler with a block diagram. (10 Marks)
  - b. Construct transition diagram for the following: i) Relational operators ii) Identifiers and keywords iii) Unsigned numbers. (06 Marks)
  - c. Construct a NFA for regular expression  $(a / b)^* abb$  (04 Marks)
  
2.
  - a. Define Ambiguity. Show that the following grammar is ambiguous :  
 $E \rightarrow E + E / E - E / E * E / (E) / id$  (08 Marks)
  - b. Given the grammar:  $E \rightarrow E + T / T ; T \rightarrow T * F / F ; F \rightarrow (E) / id$ .
    - i) Remove left recursion.
    - ii) For the resulting grammar, construct LL (1) parsing table. (12 Marks)
  
3.
  - a. Determine the operating precedence relation table for the grammar :  
 $E \rightarrow E + E | E - E | E * E | E / E | E \uparrow E | (E) | - E | id$ , assuming
    - i)  $\uparrow$  is of highest precedence and right-associative.
    - ii)  $*$  and  $/$  are of next highest precedence and left associative and
    - iii)  $+$  and  $-$  are of lowest precedence and left - associative. (10 Marks)
  - b. Construct Canonical LR (1) parsing table for the grammar.  
 $E \rightarrow E + T / T ; T \rightarrow T * F / F ; F \rightarrow (E) / id$  (10 Marks)
  
4.
  - a. Construct LALR parsing table for the grammar :  $S \rightarrow C C ; C \rightarrow c C / d$ . (10 Marks)
  - b. Briefly explain the concept of syntax directed definition with an example. (10 Marks)
  
5.
  - a. Explain L - attributed definition in detail. (10 Marks)
  - b. Briefly explain the different data structures used for symbol table. (10 Marks)
  
6.
  - a. Briefly explain the different types of intermediate codes with an example. (10 Marks)
  - b. Explain the structure preserving transformation on Basic blocks. (10 Marks)
  
7.
  - a. Explain in detail various issues involved in Code Generation phase. (10 Marks)
  - b. Briefly explain any five kinds of code optimization with an example each. (10 Marks)
  
8. Write short notes on:
  - a. LEX
  - b. Recursive Descent Parsing.
  - c. Error recovery in Operator - precedence parsing.
  - d. DAG representation of Basic blocks. (20 Marks)

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