

Code: R7311502

<b>R7</b>
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B.Tech III Year I Semester (R07) Supplementary Examinations, May 2013

**AUTOMATA AND COMPILER DESIGN**

(Common to IT and CSS)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Define a regular expression. Give regular expressions for the following languages.
  - (i) String over the alphabet {a, b} ending with ab.
  - (ii) Strings over the alphabet {0, 1} that contain substring 10.
  - (iii) Strings over the alphabet {0, 1} that contain 1 in the 3<sup>rd</sup> position from right end.(b) Explain in brief about FA and its applications for the lexical analysis.
  
- 2 Construct predictive parsing table for the following grammar.  
bexpr  $\rightarrow$  bexpr or bterm / bterm  
bterm  $\rightarrow$  bterm and bfactor / bfactor  
bfactor  $\rightarrow$  not bfactor / (bexpr) / true / false  
Is this grammar LL (1)? Specify your answer with reason.
  
- 3 Construct LALR parsing table for the following grammar. Show the actions of the parser for the string (a, a).  
 $S \rightarrow a / \wedge / (R)$        $R \rightarrow T$        $T \rightarrow S, T / S$
  
- 4 (a) What is the use of a dependency graph for annotated parse trees? Explain with an example.  
(b) Write three address codes for the following C-program statements.  
if (a<b) { if (b<c) x = 1; } else x = 10;
  
- 5 (a) Explain how to represent the data types in type-trees and type-graphs.  
(b) What is type checker? Write translation scheme for the type checking of expression.
  
- 6 (a) Explain the dynamic storage allocation facilities provided by C language.  
(b) What is dangling reference in storage allocation? Explain with an example.
  
- 7 Explain about organization for optimizing compiler.
- 8 Explain about macros and their features.

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