7E4091

Roll No. _____ [Total No. of Pages : 3]

7E4091

B. Tech. VII Semester (Back) Examination, Nov/Dec-2011

Computer Engineering

7CS1 Compiler Construction

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five questions** selecting **one** question from **each unit.** All questions carry **equal marks.** Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) What are the various phases of a compiler? Explain the function of each phase using a suitable example. **(8)**

   b) What is Bootstrapping? Explain it. **(4)**

   c) Construct a finite automata accepting a string containing odd number of zeros and an even number of ones. **(4)**

OR

1. a) Define the following terms :-

   i) Token

   ii) Pattern

   iii) Lexeme

   iv) Regular expression. **(2×4)**

   b) Explain the concept of input buffering in detail. **(6)**

   c) What types of errors are reported by Lexical analysis. **(2)**

Unit - II

2. a) What is left recursion? How we can remove left recursion from a grammar. **(6)**

b) Show that the following grammar :-

$S \rightarrow Aa\ Ab / Bb\ Ba$
$A \rightarrow \in$
$B \rightarrow \in$

is LL (1) but not SLR (1). **(6)**

c) Explain the followings :-

i) Contest free grammar

ii) FIRST and FOLLOW. **(2×2)**

OR

2. a) Explain the model of non - recursive predictive parser using an algorithm. **(6)**

b) Construct a canonical LR parsing table from the following grammar :-

$S \rightarrow CC$
$C \rightarrow eC$
$C \rightarrow d$ **(8)**

c) Explain the following terms :-

i) Handles

ii) Viable prefix. **(1×2)**

Unit - III

3. a) Explain the meaning of quadruples, triples and indirect triples using a suitable example. **(8)**

b) Define the followings :-

i) S - attributed definition

ii) L - attributed definition. **(4×2)**

OR

3. a) Define SDD? Explain the various forms of Syntax directed definitions. **(8)**

   b) Write short notes on the followings :-

      i) Dependency graph

      ii) Intermediate code representation. **(4×2)**

Unit - IV

4. a) Explain different parameter passing mechanisms for a procedure call. **(8)**

   b) Explain the various data structures for symbol table organisation. **(8)**

OR

4. a) Write short notes on the followings :-

      i) Stack allocation

      ii) Heap allocation. **(4×2)**

   b) What are activation records. Explain different fields of activation records. **(8)**

Unit - V

5. a) Explain principle sources of code optimization. **(8)**

   b) Show the various steps in the code generation of the expression $(a+b)/(c+d)$, assuming two machine registers are available. **(8)**

OR

5. a) Explain using an example :-

      i) Common subexpression elimination

      ii) Dead code elimination. **(4×2)**

   b) Explain the various issues in code generation. **(8)**
