

<b>7E 4239</b>	Roll No.	[Total No. of Pages : 3]
	<b>7E 4239</b>	
<b>B.Tech. VII Semester (Main/Back) Examination - 2014</b> <b>Computer Sc. &amp; Engineering</b> <b>7CS3 Compiler Construction</b>		

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) Why do we need syntax trees when constructing compilers?  
b) What are the fundamental differences between parse trees and abstract syntax tree?

**OR**

1. a) How can we represent trees as terms? Illustrate your explanation with an example  
b) Explain the various compiler phases in brief with suitable example.

**Unit - II**

2. Let G be a formal grammar with nonterminal symbols S, T, E and E', terminal symbol 'x', '+', and '\$', start symbol S, and the following production rule :

$$S \rightarrow ES$$

$$E \rightarrow TE'$$

$$E' \rightarrow +TE'$$

$$T \rightarrow X$$

- a) Construct an LL(0) parse table for the grammar calculate FIRST and FOLLOW Sets as needed .

- b) Use the parse table to recognize the sentence  $x+x$ . Show the stack and the remaining input after each step.

**OR**

2. Let  $G$  be a formal grammar with nonterminal symbol  $S, T$  and  $E$ , terminal  $x, +$  and  $\$,$  start symbol  $S$ , and the following production rules

$$S \rightarrow E\$$$

$$E \rightarrow T + E$$

$$E \rightarrow T$$

$$T \rightarrow X$$

- Explain the role of the terminal symbol  $\$$
- Construct a LR(0) parse table for the grammar.
- What Kind of Conflict does the resulting parse table contain?
- Explain two strategies to resolve this conflict.

**Unit - III**

3. Let  $G$  be a formal grammar with nonterminal Symbol  $S$  and  $D$ , terminal Symbol 'b', '0' and '1', start symbol  $S$ , and the following production rule

$$S \rightarrow bD$$

$$D \rightarrow 0D$$

$$D \rightarrow 1D$$

$$D \rightarrow 0$$

$$D \rightarrow 1.$$

- Is  $G$  regular ? Why (not)?
- Turn  $G$  Systematically into a finite automation?

**OR**

3.
  - Explain the Syntax Directed Translation Schemes in details.
  - What is the process and importance of intermediate code Generation.

**Unit - IV**

4.
  - Explain the various strategies of symbol table creation and organization.

- b) What are Activation trees and Activation Records. Explain the Data Access process without out Nested procedures.

**OR**

4. Write short notes on
- Nesting depth and Access links.
  - Data structures used in symbol table.
  - Static Verses Dynamic Storage allocation.

**Unit - V**

5. Consider the expression (left to right Scanning).  $(a/b*c) + (a/b) - (b+(a*b)) (a*b)$
- Draw the Abstract tree of the above expression.
  - Draw the DAG of the above expression.
  - Generate three address code from the DAG

**OR**

5. a) What are the various issues in design of code generator, loop optimization?  
b) What are the Advantages of DAG? Explain the peephole optimization.  
c) Explain the steps required for code generation from DAG.