

Code No: RT31051

**R13**
**SET - 1**
**III B. Tech I Semester Supplementary Examinations, May - 2018**
**COMPILER DESIGN**

(Computer Science and Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answering the question in **Part-A** is compulsory  
 3. Answer any **THREE** Questions from **Part-B**

**PART -A**

- 1 a) Explain the following: Lexeme, Token and pattern. [3M]
- b) What is ambiguity? How to eliminate it? Give example. [3M]
- c) Explain about error recovery in LR parser. [4M]
- d) Write SDTs for the Boolean expression grammar. [4M]
- e) Explain various parameter passing mechanisms. [4M]
- f) Discuss inter procedural optimization with example. [4M]

**PART -B**

- 2 a) What are different analysis phases of compiler? Explain the reasons for separation of lexical analysis from syntax analysis [8M]
- b) Write a lexical analyzer program to identify Strings, Sequences, Comments, Reserved words and identifiers. [8M]
- 3 a) "Top down parser is also considered as Left Most Derivation" Justify this with an example. [6M]
- b) Prove that the given grammar is LL(1) grammar [10M]  
 $S \rightarrow aBDh$   $B \rightarrow cC$   $C \rightarrow bc/\epsilon$   $D \rightarrow EF$   $E \rightarrow g/\epsilon$   $F \rightarrow f/\epsilon$
- 4 a) Differentiate the following [8M]  
 i) Sentence and sentential form ii) LR (0) and LR (1) items.  
 ii) Action and GoTo functions
- b) Explain the algorithm to construct the LR(0) items and construct LR(0) items for the given grammar given in  $A \rightarrow A+B/B$   $B \rightarrow B*D/D$   $D \rightarrow (A)/id/num$  [8M]
- 5 a) What is dependency graph? Construct dependency graph for the expression  $a-4+c$  using syntax directed definition of  $E \rightarrow TE1$   $E1 \rightarrow +TE1/-TE1/\epsilon$   $T \rightarrow (E)/id/num$  [8M]
- b) Differentiate inherited and synthesized attributes with an example. [8M]
- 6 a) What is a leader of basic block? Write and explain the algorithm used to find leaders. Draw flow graph for matrix multiplication. [8M]
- b) Draw and explain the Runtime memory organization static storage allocation strategy with pros and cons. [8M]
- 7 a) Explain about the sources and criterions of code optimization as machine dependent and independent types. [8M]
- b) Write short notes on Function preserving optimization techniques. [8M]

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