

B5.2-R4 : AUTOMATA THEORY AND COMPILER DESIGN**NOTE :**

1. Answer question 1 and any FOUR from questions 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

Time : 3 Hours**Total Marks : 100**

1. Differentiate between :
 - (a) Context free grammar and Context sensitive grammar
 - (b) NFA and DFA
 - (c) Flow graph and Flow Chart
 - (d) S-Attributed Definitions and L-Attributed Definitions
 - (e) Top down and Bottom up approach
 - (f) Compiler and Interpreter
 - (g) Syntax analysis and Lexical analysis

(7x4)

2. (a) Define Ambiguous grammar. Show that the following grammar is ambiguous and write the unambiguous grammar for the same.

$$S \rightarrow i C t S \mid i C t S c S \mid a$$

$$C \rightarrow b$$

 (b) Explain with an example, the recursive descent parser with back tracking. (10+8)

3. (a) Explain the issues in the design of a code generator.

 (b) Generate the code for the following three address statement, using the code generation algo. 'd' live at the end.

$$t = a - b$$

$$u = a - c$$

$$v = t + u$$

$$d = v + u$$

(10+8)

4. (a) Explain with diagram, the phases of a compiler.

 (b) Construct a transition diagram for recognizing unsigned numbers. Write pseudocode to implement it with showing the first two states and one final state. (9+9)

5. (a) Discuss the benefits of dynamic storage allocation. Explain various dynamic storage allocation techniques in detail.
(b) Discuss the issues of source language and how can it be overcome. Explain in detail. (9+9)

6. Obtain a set of canonical LR(0) items for the grammar, and check whether the grammar is SLR(1) or not. Give reason.

$S \rightarrow L = R$

$S \rightarrow R$

$L \rightarrow *R$

$L \rightarrow id$

$R \rightarrow L$

(18)

7. Write short notes on : (any Three)

- (a) Non Deterministic TM
(b) Backus Naur Form (BNF)
(c) Moore machine and Mealy machine
(d) Equivalence of CFG and PDA

(6+6+6)

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