

Code No: 125DR

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, May - 2018****AUTOMATA AND COMPILER DESIGN****(Information Technology)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Define Token, Pattern and Lexeme. [2]
- b) What is Context free grammar? [3]
- c) What are the actions performed by Shift reduce parser? [2]
- d) List out the rules for FIRST and Follow. [3]
- e) What is type checking? [2]
- f) Draw the model of Chomsky hierarchy of grammars. [3]
- g) Define Flow Graph. [2]
- h) What is dynamic storage allocation? [3]
- i) Define Code generation. [2]
- j) List out the issues in the design of a code generation. [3]

PART - B**(50 Marks)**

- 2.a) Construct Finite Automata for the regular Expression $1(01+10)^*00$.
- b) Show that $L=\{a^{2n}/n<0\}$ is Regular. [5+5]

OR

- 3.a) Define Derivation tree. Explain about LMD and RMD.
- b) Construct a derivation tree for the string abcd from the grammar: [5+5]

$S \rightarrow aAB,$
 $A \rightarrow bC,$
 $B \rightarrow d,$
 $C \rightarrow cd$

- 4.a) Construct a LALR Parser for the Grammar:
 $S \rightarrow CC,$
 $C \rightarrow CC,$
 $C \rightarrow c/d$
- b) Construct a annotated parse tree for the expression $3*5+4/n$. [5+5]

OR

- 5.a) Construct SLR Parsing table for the grammar $S \rightarrow L=R/R, L \rightarrow *R/id, R \rightarrow L$.
- b) Construct an annotated parse tree for $9-5+2$. [5+5]

- 6.a) Explain in brief about Type checking and Type Conversion.
b) Explain about the procedure for checking polymorphic functions. [5+5]
- OR**
- 7.a) Explain in detail about Polymorphism.
b) Explain in brief about Chomsky hierarchy of grammars. [5+5]
- 8.a) Differentiate between Static and Dynamic Storage allocation Strategies.
b) Explain in brief about Heap Storage allocation strategy. [5+5]
- OR**
- 9.a) List out and explain about the criteria are required for Code improving Transformations.
b) Define Basic block? Explain in brief about optimization of basic blocks. [5+5]
- 10.a) Explain in detail the procedure that eliminates global common sub expression.
b) What is an Induction variable? Explain it with an example. [5+5]
- OR**
- 11.a) Explain reducible and non reducible flow graphs with examples.
b) Explain in detail about the garbage collection via Reference Counting. [5+5]

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