

Code No: 115DR

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

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) What is Pumping lemma? Explain it with an example? [2]
- b) Let G be the grammar $S \rightarrow 0B/1A$, $A \rightarrow 0/0S/1AA$, $B \rightarrow 1/1S/0BB$, for some string construct Left most derivation. [3]
- c) Write in brief about semantic errors. [2]
- d) Write about synthesized attributes with an example. [3]
- e) What is type conversion? [2]
- f) Write in brief about Overloading of Functions. [3]
- g) Which data structure will be used to implement a symbol table in an efficient way? Give reasons. [2]
- h) What is machine dependent code optimization? On what factors does it depend? [3]
- i) Define Code generation. [2]
- j) Write in brief about DAG representation of basic block. [3]

PART - B**(50 Marks)**

- 2.a) Construct a Finite Automata accepting all strings over $\{0,1\}$
 - i) Having odd number of 0's and
 - ii) having even number of 1's?
 - b) Write about the identity rules for regular expressions. [5+5]
- OR**
- 3.a) Construct a minimal DFA accepting all strings over $\{0,1\}$ that do not contain 101 as a sub string?
 - b) Explain in brief about Applications of Finite Automata. [5+5]
- 4.a) Differentiate between Top down and Bottom up Parsing methods.
 - b) Construct CLR parser for the grammar $S \rightarrow L=R, S \rightarrow R, L \rightarrow *R, R \rightarrow L$. [5+5]
- OR**
- 5.a) Define Ambiguous grammar? Explain it with an Example.
 - b) Construct SLR Parser for the grammar $S \rightarrow CC, C \rightarrow cC/d$. [5+5]
- 6.a) Describe about type expressions.
 - b) Explain in brief about Inherited Attributes with an example. [5+5]
- 7.a) Discuss about Chomsky hierarchy of languages and generators.
 - b) Explain about Type checking of overloaded functions and operators. [5+5]

- 8.a) Define Symbol table? Discuss various symbol table organization techniques.
b) What is Heap storage allocation? Explain in detail. [5+5]

OR

- 9.a) Discuss about the Stack allocation strategy of Run time environment with an example.
b) What is dangling Reference in storage allocation? Explain with an Example. [5+5]

10. Explain in detail the generic code generation algorithm. [10]

OR

- 11.a) Explain in brief about the issues in the design of a code generator.
b) Explain reducible and non reducible flow graphs with examples. [5+5]

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