

**R15**

Code No: 125DR

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 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 DFA with example. [2]
- b) Define the following terms - Compiler, Interpreter, and Translator. [3]
- c) What are types of LR parsers? Compare them. [2]
- d) What are the conflicts occur during shift-reduce parsing. [3]
- e) What is meant by name equivalence? Give an example. [2]
- f) Define CFG and CSG with an example. [3]
- g) What are the limitations of static allocation? [2]
- h) What is dead code elimination? [3]
- i) What is relocatable machine code? [2]
- j) Define address descriptor and discuss its importance. [3]

**PART - B****(50 Marks)**

- 2.a) Construct a NFA with  $\epsilon$  equivalent to the regular expression:  
 $10 + (0 + 11)0^*1$
- b) Explain the role Lexical Analyzer and issues of Lexical Analyzer in compiler design. [5+5]

**OR**

- 3.a) Write a CFG that generates equal number of a's and b's.
  - b) Construct the predictive parser the following grammar: [5+5]  
 $S \rightarrow (L)a$   
 $L \rightarrow L,S|S$
4. Construct LALR parsing table for the grammar given below: [10]  
 $S \rightarrow CC$   
 $C \rightarrow cC|d$

**OR**

- 5.a) Write the short note on:
  - i) Abstract syntax tree
  - ii) Polish notation
  - iii) Three address code
- b) What is dependency graph? What is its significance? [6+4]

- 6.a) Explain in detail Chomsky hierarchy of languages.  
b) Explain in detail type conversion with suitable examples. [5+5]
- OR**
- 7.a) Give some solutions to resolve an overloaded symbol.  
b) Write short note on function overloading. [5+5]
8. Explain the different storage allocation strategies. [10]
- OR**
9. Explain the principle sources of optimization. [10]
10. State and explain different machine dependent code optimization techniques. [10]
- OR**
- 11.a) Explain why Next-use information is required for generating object code.  
b) Explain in detail about DAG for register allocation with example. [5+5]

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