

R15

Code No: 125AP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December -2017

COMPILER DESIGN

(Computer Science and Engineering)

Max. Marks: 75

Time: 3 hours

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 are the features of a Lexical analyser? [2]
- b) Explain in brief about left most and right most derivations. [3]
- c) Define Left recursive grammar. [2]
- d) List out the rules for FIRST and Follow. [3]
- e) What are the advantages of heap storage allocation? [2]
- f) Define Type Equivalence. [3]
- g) What is algebraic transformation? [2]
- h) Write in brief about flow graphs. [3]
- i) What are the forms of a target program? [2]
- j) What is machine independent code optimization? [3]

PART - B**(50 Marks)**

- 2.a) Define Regular Expression? Write about the identity rules for regular expressions. [5+5]
- b) Discuss in brief about left Recursion and Left Factoring with examples. [5+5]

OR

- 3.a) Define Compiler. Explain in brief about the LEX compiler. [5+5]
- b) Construct FIRST and FOLLOW for the Grammar:
 $E \rightarrow E+T/T, T \rightarrow T^*F/F, F \rightarrow (E)/id$?

- 4.a) Construct SLR parsing table for the following grammar.
 $E \rightarrow E+T/T, T \rightarrow T^*F/F, F \rightarrow (E)/id$ [5+5]
- b) Discuss in brief about Yacc. [5+5]

OR

- 5.a) Construct CLR parsing table for the following grammar.
 $E \rightarrow E+T/T, T \rightarrow T^*F/F, F \rightarrow (E)/id$. [5+5]
- b) Discuss in brief about error recovery strategies in Parsing. [5+5]

- 6.a) Explain in brief about Type checking and Type Conversion. [5+5]
b) Define Symbol table. Explain about the data structures used for Symbol table.

OR

- 7.a) Explain in brief about Stack Storage allocation strategy? [5+5]
b) Define activation record? Explain in brief about the fields in activation record.

8. What is DAG? Construct DAG for the following Basic block? [10]
 $D := B * C; \quad E := A + B; \quad B := B + C; \quad A := E - D;$

OR

9. Explain how copy propagation can be done using data flow equation? [10]

10. Define loop optimization? Describe in brief about the transformation on basic blocks. [10]

OR

- 11.a) Explain reducible and non reducible flow graphs with examples. [5+5]
b) Discuss about Instruction Selection and Register allocation.

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