

R16

Code No: 136AQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2019

COMPILER DESIGN

(Common to CSE, IT)

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 regular expression. [2]
- b) Define linker and loader and explain briefly. [3]
- c) Define ambiguous grammar. [2]
- d) Compare SLR, CLR and LACR. [3]
- e) What is coercion? [2]
- f) How to find evaluation order for SDD's? [3]
- g) What are the limitations of static allocation? [2]
- h) Write the fields and uses of symbol table. [3]
- i) What is common sub-expression elimination? Explain. [2]
- j) What are induction variables? What is induction variable elimination? [3]

PART - B

(50 Marks)

- 2.a) Explain the procedure to convert regular expression to Finite automata.
- b) Explain various phases in the construction of compiler with a neat sketch. [5+5]

OR

- 3.a) What is the functionality of preprocessing and input buffering?
- b) Explain compiler construction tools. [5+5]

- 4.a) What is left recursion? Describe the algorithm used for eliminating left recursion?
- b) Eliminate left recursion in the following: [5+5]
 $E \rightarrow E+T \mid T$, $T \rightarrow T * F \mid F$, $F \rightarrow (E) \mid id$

OR

- 5.a) What is ambiguous grammar? Show that following grammar is ambiguous or not.

$A \rightarrow A + A \mid A - A \mid A * A \mid a$

- b) Verify whether the following grammar is LL(1) or not? [5+5]

$E \rightarrow E + T \mid T$

$T \rightarrow T * F \mid F$

$F \rightarrow (F) \mid a \mid b$.

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6.a) What are three address codes? Explain different types of representations of three address code.

AG AG AG AG OR AG AG AG AG A [5+5]

b) Write three codes for $x:=A[y, z]$

7.a) What is type checker? Explain the specification of a simple type checker.

b) Explain translation schema for array elements.

[5+5]

8.a) Explain about Heap management.

b) Define reference counting. What is the role of reference counting in garbage collection?

AG AG AG AG OR AG AG AG AG A [5+5]

9.a) Give the detailed description on DAG.

b) Explain different methods for register allocation and assignment.

[5+5]

10.a) Explain redundancy elimination techniques.

b) Write the principal sources of optimization.

[5+5]

AG AG AG AG OR AG AG AG AG A [5+5]

11.a) Explain loop optimization technique with example.

b) Explain constant propagation with example.

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