

Code No: 115AP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech III Year I Semester Examinations, February/March - 2016

COMPILER DESIGN

(Computer Science and Engineering)

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 Boot strapping. [2]
- b) What is Context free grammar? [3]
- c) What are the actions performed by Shift reduce parser? [2]
- d) Describe in brief about types of LR parsers? [3]
- e) What is type expression? [2]
- f) Define Type Equivalence? [3]
- g) Define Basic Block? [2]
- h) How can you identify the leader in a Basic block? [3]
- i) Which graph is used for identifying the common sub expression in an expression? [2]
- j) What is meant register allocation and assignment? [3]

## Part-B

(50 Marks)

- 2.a) Define Regular Expression? Explain about the Properties of Regular Expressions.
- b) Differentiate between Top down and bottom up parsing techniques. [5+5]

OR

- 3.a) Define Compiler? Explain in brief about the syntax and semantic analysis of a compiler with an example?
- b) Construct a Predictive parsing table for the Grammar  $E \rightarrow E+T/T, T \rightarrow T * F / F, F \rightarrow (E) / id$ . [5+5]

- 4.a) Construct SLR parsing table for the following grammar.  
 $E \rightarrow E+T/T \quad T \rightarrow T * F / F \quad F \rightarrow (E) / id$ .

- b) Discuss in brief about Yacc. [5+5]

OR

- 5.a) Construct CLR Parsing table for the grammar  $S \rightarrow L=R/R, L \rightarrow *R/id, R \rightarrow L$
- b) Define Ambiguous Grammar? Check whether the grammar  $S \rightarrow aAB$   
 $A \rightarrow bC/cd, C \rightarrow cd, B \rightarrow c/d$  Is Ambiguous or not. [5+5]

- 6.a) Explain in detail about Polymorphism.

- b) Explain in brief about Heap Storage allocation strategy. [5+5]

OR

- 7.a) Construct an annotated parse tree for  $9-5+2$ .

- b) Explain in brief about equivalence of type expressions. [5+5]

- 8.a) Explain in brief about different Principal sources of optimization techniques with suitable examples.
- b) Define Flow Graph? Explain how a given program can be converted in to flow graph. [5+5]

OR

- 9.a) What is DAG? Construct DAG for the following Basic block.  
D: = B\*C; E:= A+B; B:=B+C; A:=E-D;
- b) Explain how copy propagation can be done using data flow equation. [5+5]
10. Explain in detail the procedure that eliminates global common sub expression. [10]

OR

- 11.a) What are the object code forms? Explain the issues in code generation.
- b) Explain about machine dependent code optimization. [5+5]

OR