

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 [5+5]

$$E \rightarrow E+T/T, T \rightarrow T*F/F, F \rightarrow (E)/id .$$

- 4.a) Construct SLR parsing table for the following grammar.

$$E \rightarrow E+T/T \quad T \rightarrow T*F/F \quad F \rightarrow (E)/id .$$

- 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 $S \rightarrow aAB$ [5+5]

$$A \rightarrow bC/cd, C \rightarrow cd, B \rightarrow c/d \quad \text{Is Ambiguous or not.}$$

- 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 $1+3*2$.

- 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]

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