

**Code No: 115AP****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech III Year I Semester Examinations, March - 2017****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) Write regular expression over alphabet {a, b, c} containing at least one 'a' and at least one 'b' [2]
- b) What is input buffering? How is input buffering implemented? [3]
- c) What is operator precedence grammar? Give an example. [2]
- d) What is significance of lookahead operator in LR parsing? [3]
- e) What is the s – attributes and l – attributes? [2]
- f) What is activation record? [3]
- g) What is dead code elimination and reduction in strength? [2]
- h) Define loop unrolling. Give an example. [3]
- i) What is meant by register descriptor and address descriptor? [2]
- j) How to allocate registers to instruction? [3]

**PART – B****(50 Marks)**

- 2.a) Explain the concept of bootstrapping with example.
- b) Consider the following Conditional statement:  
if (x > 3) then y = 5 else y = 10;  
How does lexical analyzer help the above statement in process of compilation? [4+6]

**OR**

3. Construct predictive parsing table for the following grammar [10]  
 $S \rightarrow (L) | a$   
 $L \rightarrow L, S | S$
4. Find the LR (0) set of items for the following grammar. Describe state diagram and construct parse table of that [10]  
 $S \rightarrow CC$   
 $C \rightarrow cC | d$

**OR**

- 5.a) Write a procedure to construct LALR parsing table.
- b) Write short notes on YACC. [5+5]

6. What is symbol table? Discuss various ways to organizing symbol table. [10]
- OR**
7. Translate the following expression:  
 $(a + b) * (c + d) + (a + b + c)$  into  
a) Quadruples            b) Triples            c) Indirect triples [3+3+4]
- 8.a) What is liveness? Explain liveness with suitable example.  
b) Write a procedure to identify basic blocks. [5+5]
- OR**
9. Illustrate loop optimization with suitable example. [10]
10. Explain various method to handle peephole optimization. [10]
- OR**
11. Generate the code for the following expression:  $x = (a + b) - ((c + d) - e)$ . Also Compute its cost. [10]