R13

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]
   $S \rightarrow (L) \mid a$
   $L \rightarrow L, S \mid S$

4. Find the LR (0) set of items for the following grammar. Describe state diagram and construct parse table of that   [10]
   $S \rightarrow CC$
   $C \rightarrow cC \mid d$

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]