**R13**

Code No: 115AP

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**
**B. Tech III Year I Semester Examinations, November - 2015**
**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 Cross Compiler.                                                                  [2]
  b)    Eliminate immediate left recursion for the following grammar:
        E->E+T | T
        T->T* F | F
        F-> (E) | id                                                                            [3]
  c)    List the rules for computing FOLLOW SET.                                                 [2]
  d)    Define CLOSURE (I).                                                                       [3]
  e)    What is a symbol table?                                                                   [2]
  f)    What does a semantic analysis do?                                                         [3]
  g)    Define basic block in a flow graph.                                                       [2]
  h)    What is a DAG? Mention its applications                                                   [3]
  i)    Generate a object code for following statements
        a = b + c;   d = a+e                                                                      [2]
  j)    Mention the properties that a code generator should possess.                             [3]

## PART - B (50 Marks)

2.    What are the various phases of the compiler? Explain each phase in detail.      [10]
                                          **OR**
3.    Construct the predictive parser for the following grammar:                      [10]
      S->(L)/a
      L->L,S/S

4.    Find the SLR parsing table for the given grammar:
      E->E+E | E*E | (E) | id.
      And parse the sentence (a+b)*c.                                                  [10]
                                          **OR**
5.    Construct an LALR Parsing table for the following grammar:                      [10]
      E-> E+T |T
      T-> T*F|F
      F->id

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6.  Generate intermediate code for the following code segment along with the required syntax directed translation scheme:
    if(a>b)
    x=a+b
    else
    x=a-b
    Where a and x are of real and b of int type data.                     [10]

**OR**

7.  Give syntax directed translation scheme for simple desk circulator.     [10]

8.  Explain the following with an example:
    a) Redundant sub expression elimination
    b) Frequency reduction
    c) Copy propagation.                                                 [3+3+4]

**OR**

9.  Optimize the following code using various optimization techniques:     [10]
    i=1; s=0;
    for (i=1; i<=3; i++)
    for (j=1;j<=3;j++)
    c[i][j]=c[i][j] + a[i][j] + b[i][j]

10. Explain in detail about machine dependent code optimization techniques.   [10]

**OR**

11. Give an example to show how DAG is used for register allocation.        [10]


**–--ooOoo---**