USN | | | | | | | | | | **10IS662**

Sixth Semester B.E. Degree Examination, June/July 2014
Compiler Design

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1   a. Draw diagram for language processing system.   **(04 Marks)**
    b. Explain general structure of a compiler.   **(08 Marks)**
    c. Write an algorithm for "look ahead code with sentinels".   **(04 Marks)**
    d. Draw a transition diagram for identifiers and keywords. How do you handle reserve words that look like identifiers?   **(04 Marks)**

2   a. For the following grammar
        S → (L) | a
        L → L, S | S
        Make necessary changes to make it suitable for LL(1) parser.   **(02 Marks)**
    b. After doing necessary changes in Q2(a) grammar check whether it is LL(1) grammar or not. If yes, parse the string (a, a).   **(10 Marks)**
    c. List all error recovery methods in LL(1) parser. Explain one method suitable for the grammar given below.
        S → AbS | e | ∈
        A → a | cAd   string is "ceadb"   **(08 Marks)**

3   a. What is a shift reduce parser? Explain the conflict that may occur during shift reduce parsing.   **(04 Marks)**
    b. What is handle pruning? Explain with the help of the grammar S →SS + | SS* | a and input string aaa*a++.   **(08 Marks)**
    c. Give Bottom-up parsing for the strings 000111 and grammar S → OS1 | 01   and construct parse tree in each step of deviation.   **(08 Marks)**

4   a. Write algorithm for construction of canonical LR(1) parsing table.   **(10 Marks)**
    b. Construct LALR parsing tables for the grammar shown below using LR(1) items.
        S → CC
        C → c C | d   **(10 Marks)**

PART – B

5   a. Write a SDD for desktop calculator.   **(04 Marks)**
    b. Assume suitable SDD to construct a syntax tree for the expression   a – 4 + c   and what are the steps involved in construction of that syntax tree.   **(08 Marks)**
    c. Construct annotated parse tree for 3*5   and write dependency graph for the constructed parse tree.   **(08 Marks)**

6 a. List various 3 address instruction forms. Give one example for each. **(10 Marks)**

b. Construct DAG for the expression

$(x + y) - ((x + y) * (x - y))) + ((x + y) * (x - y))$ **(06 Marks)**

c. Write case 3 address code instructions used to translate a switch statement. **(04 Marks)**

7 a. Discuss about the various components and their use in an activation record. **(08 Marks)**

b. What do you mean by calling sequence? Explain the actions performed during
(i) function call   (ii) return. **(08 Marks)**

c. Draw subdivision of run-time memory into code and data areas. **(04 Marks)**

8 a. For the following program segment generate intermediate code and flowgraph of that code.

```
for i from 1 to 10 do
    for j from 1 to 10 do
        a[i, j] = 0.0 ;
    for i from 1 to 10 do
        a[i, i] = 1.0 ;
```
(10 Marks)

b. What are the steps involved in optimization of Basic blocks. Explain any 2 steps.

(10 Marks)

* * * * *