USN | | | | | | | | | | |

06CS63

Sixth Semester B.E. Degree Examination, Dec.2013/Jan.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. Explain with diagram the phases of a compiles. Show the transition made by each of these phases for the statement a = b + c * 10, where a, b and c are reals. **(10 Marks)**

b. Explain input buffering with sentinels, write the look ahead code for the same. **(08 Marks)**

c. Construct a transition diagram to recognize the following tokens:
i) Identifier; ii) Integer constant. **(02 Marks)**

2 a. Define with an example:
i) Left most derivation.
ii) Right most derivation.
iii) Parse trees. **(06 Marks)**

b. Eliminate left recursion from the following grammar:
A → BC/a
B → CA/Ab
C → AB/CC/a **(08 Marks)**

c. Find 'FIRST' and FOLLOW for the following:
E → E + T/T
T → T * F/F
F → (E)/id **(06 Marks)**

3 a. Explain SLR parsing table for the grammar given in Q. 2(c). **(12 Marks)**

b. Define handle with an example. **(04 Marks)**

c. For the grammar S → 0S1/01. give shift reduce configuration on input string 000111. **(04 Marks)**

4 a. Given the grammar,
S → L = R
S → R
L → * R
L → id
R → L
i) Construct set of LR(1) items.
ii) Construct LR(1) canonical parsing table. **(15 Marks)**

b. Explain error recovery in LR parsers. **(05 Marks)**

PART – B

5 a. Briefly explain the concept of syntax directed definition, with examples. **(06 Marks)**

b. Define synthesized and inherited attributes. **(04 Marks)**

c. Give SDD to process a simple variable declaration in 'C' and give annotated parse tree for the following expression int a, b, c. **(10 Marks)**

6 a. List the common three-address instruction forms. **(08 Marks)**

b. Translate the arithmetic expressions

a = b * - c + b * - c into

i) A syntax tree

ii) Quadruples

iii) Triples

iv) Indirect triples. **(12 Marks)**

7 a. Explain activation record and the contents of activation record. **(10 Marks)**

b. Write short notes on:

i) Heap management

ii) Garbage collection. **(10 Marks)**

8 a. Translate the following program into three address statements:

```
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;
```

(08 Marks)

b. Construct the flow graph for the code from Q.8(a). **(05 Marks)**

c. Identify the loops in the flow graph from Q.8(b). **(03 Marks)**

d. Construct the DAG for the basic block

a = b + c

b = a – d

c = b + c

d = a – d **(04 Marks)**

* * * * *