(Following Roll No. to be filled by candidate)

Roll No.

B TECH
SIXTH SEMESTER EXAMINATION 2015-2016
ECS603
COMPILER DESIGN

Time: 3 Hours **Max. Marks: 100**

Note: Attempt all questions. Marks and number of questions to be attempted from the section is mentioned before each section.

1. Attempt any four Parts. **[4x5]**

a. What do you mean by Cross-Compiler?
b. Discuss the role of different data structures used in compiler design.
c. Write Short notes on YACC parser generator.
d. Show that the following grammar is ambiguous or not.
S→S+S/ S*S/ a
e. Differentiate between Synthesized and Inherited attributes.

2. Attempt any four Parts. **[4x5]**

a. What are the drawbacks of Top-Down backtracking parser?
b. Consider following grammar (where ε denotes **null**) and find out FOLLOW of every non-terminal.
S→aABb
A→c/ ε
B→d/ ε
c. Define Lexical and Syntactic phase errors?
d. Differentiate between Machine-dependent and Machine-independent code optimization.
e. Define Loop-Jamming with example.

3. Attempt any two Parts. **[2x10]**

a. What do you understand by pass? Discuss merits and demerits of single pass and multipass compiler. How Bootstrapping of compiler to more than one machine is done?
b. Find the DFA recognizing the language described by following regular expression. Also minimize the DFA if possible.
(a/b)*abb (a/b)*
c. Prove that no left-recursive grammar can be LL(1). Construct an LL(1) predictive parsing table for the following grammar.
S1 → S #
S →qABC
A → a/ bbD
B → a/ ε
C → b/ ε
D → c/ ε

4. Attempt any two Parts. **[2x10]**

a. Construct an LALR parsing table for the following grammar.
D→L , T
L→ L, id/ id
T→ integer

b. Generate a three address code for the following program fragment.

```
for(i=1; i<= n; i++)
{
    switch(i%2)
    {
        case 0: a[i]= a[i]+2;
                break;
        case 1: a[i]= a[i]+1;
                break;
    }
    if(n==20)
        break;
}
```

c. Write the quadruples, triples and indirect triples for the expression.
x= a* (b + c) * (d / e) + f – g

5. Attempt any two Parts. **[2x10]**

a. What are the several methods for organizing the Symbol Table? Explain in detail.
b. What is Data Flow analysis? How does it use in Code Optimization?
c. What is Compiler? Discuss the role of basic phases of compiler in the translation of source program to object code. Discuss the action taken by every phase of the compiler on the following string:
S= a + b/ c – (d * e / -f)