Code No. : 3155

FACULTY OF ENGINEERING
B.E. 4/4 (CSE) I Semester (Main) Examination, December 2010
COMPILER CONSTRUCTIONS

Time : 3 Hours] [Max. Marks : 75

*Note : Answer **all** questions from Part – A. Answer **any five** questions from Part – B.*

PART – A **(25 Marks)**

1. Discuss the structure of a symbol table for a block structured language.
2. Give two optimisation techniques for expressions.
3. What is the relationship between left recursion and top down parsing.
4. What is the relationship between leftmost derivations, rightmost derivations and top-down and bottom up parsing ?
5. Convert the grammar to CNF.

   $S \rightarrow XSB$ $\quad B \rightarrow SbS \mid X \mid bb$

   $X \rightarrow aXS \mid a$
6. Discuss the relationship between regular expressions and finite automata.
7. Give a syntax directed definition for the 'for' statement in C.
8. How are pointers in C implemented ?
9. Why do we have a semantic analysis ?
10. Discuss the difference between an interpreter and a compiler.

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PART – B (50 Marks)

11. a) Show that the following grammar is SLR (1) but not LL (1).

$S \rightarrow SA \mid A \qquad A \rightarrow a$

b) Can an ambiguous grammar be LL (1) or LR (l) ?

12. a) Discuss minimisation of finite automata with an example.

b) Show that the parser in unary are not regular.

13. Give a translation scheme for

$L \rightarrow L; S \mid S$
$S \rightarrow$ if (E)|if (E) S else S| bejin L end| A
$E \rightarrow E + T \mid T + T \rightarrow T + F \mid F \; F \rightarrow (E) \mid id$

14. How will you get a shift reduce parser for

$E \rightarrow E + E \mid E * E \mid (E) \mid id$

15. Discuss machine independent code optimisation techniques.

16. Give code for

```
Void main ( )
{
    int i, j ;
    int a[10];
    while (i < = 9) a[i] = 0;
    while ( j < = 9) a[i] = 5;
}
```

17. Discuss how you will apply LL(1) techniques for

$E \rightarrow E + E \;\; E \rightarrow E * E \;\; E \rightarrow (E) \mid L$

Idnt. :– Discuss how to modify the grammar to LL(1).

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