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Reg. No.................................

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B.TECH. DEGREE EXAMINATION, MAY 2014

Seventh Semester

Branch : Computer Science and Engineering

CS 010 702—COMPILER CONSTRUCTION (CS)

(Improvement/Supplementary)

[2010 admissions]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 3 *marks.*

1. Write a LEX pattern that recognizes decimal integers divisible by 3.
2. What is a left recursive grammar ? What is its effect in design of parsers ?
3. Write a CFG to represent floating point numbers in binary notation.
4. What is the need for intermediate code generation ?
5. What is a cross compiler ?

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. With an example, explain the structure of a LEX program.
7. What is an ambiguous grammar ? Give an example.
8. Explain run time stack.

Turn over

9. Convert the following statement to quadruples :

```
if (i < j)
{
switch (i)
{
case 1 : j = j + 1 ;
         Break ;
case 2 : j = j + 2 ;
case 3 : j = j + 3 ;
         Break ;
default : j = 0 ;
}
```

10. Give the significance of next use information in code generation.

(5 × 5 = 25 marks)

Part C

Answer **all** *questions.*
Each question carries 12 *marks.*

11. (a) For the following regular expression, draw the NFA and convert it into DFA :

$a(a \mid b)^* b^* a$.

Or

(b) Explain in detail the various phases of a compiler.

12. (a) Given the following already augmented grammar :

$S' \rightarrow S$
$S \rightarrow AB \mid AA \mid bC$
$A \rightarrow bCa \mid b$
$B \rightarrow Bd \mid \epsilon$
$C \rightarrow c$

Construct a SLR (1) parser and show the moves of the parser for the input bdd.

Or

(b) Write the top-down parser for the following grammar after rewriting it in the required format.

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

13. (a) Write syntax directed translation to convert :

    (i) Assignment statements.

    (ii) Relational expressions.

    (iii) For statements to three address code.

Or

(b) List the different parameter passing methods. Discuss each one of them.

14. (a) Write and explain the Global optimization techniques.

Or

(b) Explain how temporaries are manipulated in intermediate code generation.

15. (a) (i) Explain the concept of next use information and its significance in code generation.

    (ii) Write an algorithm for the allocation of registers.

(7 + 5 = 12 marks)

Or

(b) Explain the different data structures used for symbol table organization.

[5 × 12 = 60 marks]