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23/12/13 FN

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**Question Paper Code : 31313**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Sixth Semester

Computer Science and Engineering

CS 2352/CS 62/10144 CS 602 — PRINCIPLES OF COMPILER DESIGN

(Common to PTCS 2352 — Principles of Compiler Design for B.E. (Part-Time)  
Fifth Semester — Computer Science and Engineering — Regulation 2009)

(Regulation 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. How will you group the phases of compiler?
2. Write the regular expression for identifier and whitespace.
3. Eliminate the left recursion for the grammar  
$$S \rightarrow A a \mid b$$
$$A \rightarrow A c \mid S d \mid \epsilon .$$
4. What is meant by coercion?
5. Define backpatching.
6. Translate the arithmetic expression  $a * -(b + c)$  into syntax tree and postfix notation.
7. What is the use of Next-use information?
8. List the fields in an activation record.
9. Define loop unrolling with example.
10. What is an Optimizing compiler?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the different phases of a compiler in detail. (12)  
(ii) Discuss the cousins of compiler. (4)

Or

- (b) (i) Draw the DFA for the augmented regular expression  $(a | b)^* \#$  directly using syntax tree. (12)  
(ii) Discuss input buffering techniques in detail. (4)
12. (a) Design an LALR parser for the following grammar and parse the input  $id = id$ . (16)

$S \rightarrow L = R | R$

$L \rightarrow *R | id$

$R \rightarrow L$

Or

- (b) (i) Discuss in detail about storage allocation strategies. (8)  
(ii) Explain about various parameter passing methods in procedure calls. (8)
13. (a) (i) Write the translation scheme for flow of control statements. (8)  
(ii) Explain and compare in detail the various implementation forms of three address code. (8)

Or

- (b) (i) Write the grammar and translation scheme for procedure call statements. (12)  
(ii) Draw the DAG for the following three address code. (4)
- $d = b * c$   
 $e = a + b$   
 $b = b * c$   
 $a = e - d.$

14. (a) (i) Discuss runtime storage management in detail. (8)  
(ii) Write short notes on structure preserving transformation of basic blocks. (8)

Or

- (b) Construct DAG and three address code for the following C program.

```
    i = 1;
    s = 0;
    while (i <= 10)
    {
    s = s + a [i] [i]
    i = i + 1
    }                                     (16)
```

15. (a) (i) Write in detail about loop optimization. (8)  
(ii) Discuss the characteristics of peephole optimization. (8)

Or

- (b) Discuss in detail about global data flow analysis. (16)