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Printed Pages : 3

TCS-502

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1074

Roll No.

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B. Tech.

(SEM. V) EXAMINATION, 2008-09 COMPILER DESIGN

Time : 3 Hours]

[Total Marks : 100

- Note : (i) Attempt all questions.
(ii) All questions carry equal marks.

1 Attempt any **four** of the following sections : $5 \times 4 = 20$

- (a) How boot strapping of a compiler to more than one machine is done ? - Discuss.
- (b) What do you understand by pass ? Discuss merits and demerits of multi-pass and single-pass compiler.
- (c) Why do translators are needed ?
- (d) Discuss hierarchical structure of programming languages.
- (e) Discuss the role of different data structures in compiler design.

2 Attempt any **two** of the following sections : $10 \times 2 = 20$

- (a) What do you understand by preliminary scanning ? Describe the ways how lexical analyzer is grouped to make a pass.



(b) Why it is difficult to simulate NFA ? Discuss a method for constructing an NFA from a regular expression.

(c) What do you understand by ambiguity in grammar ? How the grammar is made unambiguous using precedence order and associativity among arithmetic operators.

3 Attempt any **two** of the following sections : **10×2=20**

(a) Explain how stack implementation of shift reduce parsing is done, considering the grammar :

$$E \rightarrow E + E$$

$$E \rightarrow E * E$$

$$E \rightarrow (E)$$

$$E \rightarrow id$$

and input string as $id_1 + id_2 * id_3$.

(b) What do you understand by left recursion and how it is eliminated ?

(c) Discuss the role of syntax directed translation scheme.

4 Attempt any **two** of the following sections : **10×2=20**

(a) Consider the following grammar :

$$S' = S\#$$

$$S \rightarrow ABC$$

$$A \rightarrow a | bbD$$



$$B \rightarrow a | \epsilon$$

$$C \rightarrow b | \epsilon$$

$$D \rightarrow c | \epsilon$$

Construct the first and follow sets for the grammar also design a LL(1) parsing table for the grammar.

(b) Write the quadruples, triples and indirect triples for the following expression :

$$(x + y) * (y + z) + (x + y + z)$$

(c) Discuss the types of errors with example which can be encountered by all the phases of the compiler.

5 Write short notes on any **two** of the following : **10×2=20**

(a) Induction variable elimination

(b) DAG representation

(c) Loop unrolling and Loop taming.

