CS/B.TECH (CSE)/RE/SEM-7/CS-701/09

1. .....
Signature of Invigilator

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CS/B.TECH (CSE)/RE/SEM-7/CS-701/09
ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL – 2009
LANGUAGE PROCESSOR (SEMESTER - 7)

Time : 3 Hours] [Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
   b) For **Groups – B** & **C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

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Marks Obtained

	Group – A										Group – B			Group – C			*Total Marks*	*Examiner's Signature*
Question Number																		
Marks Obtained																		

.....
Head-Examiner/Co-Ordinator/Scrutineer

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GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

i) A bottom-up syntax-analysis technique that can be used to parse a large class of context-free grammars is called

a) Recursive-descent parser b) Operator-precedence parser

c) LL(1) parser d) LALR parser.

ii) Which of the following uses only synthesized attributes ?

a) S-attributed grammar b) L-attributed grammar

c) Inherited attribute d) None of these.

iii) YACC builds up

a) SLR parsing table b) LALR parsing table

c) canonical LR parsing table d) none of these.

iv) Consider the following grammar G_1 :

$S \rightarrow B\ a \mid b\ C$

$B \rightarrow d \mid e\ B\ f$

$C \rightarrow g\ G \mid g$

The START symbol is S.

Which of these strings are in L (G_1), the language generated by G_1 ?

a) da b) bddf

c) eedffa d) faae.

v) Which data structure is mainly used during shift-reduce parsing ?

a) Pointers b) Arrays

c) Stacks d) Queues. ☐

vi) Which of the following expression has no l-value ?

a) a (i + 1) b) a

c) 7 d) * a. ☐

vii) A grammar in which every production rule is of the form $x \rightarrow \alpha$ is known as

a) LL (0) b) LL (1)

c) context-free d) regular. ☐

viii) If x is a terminal, the FIRST (x) is

a) ε b) { x }

c) x^* d) none of these. ☐

ix) Which of the following is not true about dynamic type checking ?

a) Type checking is done during the execution

b) It increases the cost of execution

c) All type errors are detected

d) None of these. ☐

x) Semantic analysis is applied to determine

a) the argument types b) the type of intermediate results

c) both (a) and (c) d) none of these. ☐

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. What is syntax-directed definition ? Define synthesized attribute, inherited attribute and explain with an example. 2 + 3

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3. What is dynamic type checking ? Suppose we have the following C declarations :

```
typedef struct
    {    int  a ;
         Int  b ;
    } CELL, * PCELL ;
CELL foo[100] ;
PCELL bar ( x, y ) ;
```

Write type expressions for the types of foo and bar. 2 + 3

4. Eliminate left recursion from the following grammar : 5

$E \rightarrow E + T \mid T$

$T \rightarrow TF \mid F$

$F \rightarrow F^{*} \mid a \mid b$

5. Compare between Compiler and Interpreter. What are the relationships of phases and passes of a complier ? 3 + 2

6. Explain any three characteristics of Peephole Optimization. 5

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following questions. 3 × 15 = 45

7. Consider the following grammar :

$E' \rightarrow E$

$E \rightarrow E + T \mid T$

$T \rightarrow T * F \mid F$

$E \rightarrow (E) \mid id.$

a) Construct SLR parsing table for this grammar.

b) Show the processing for the following expression using Bottom Up Parsing :

$id * id + id.$ 9 + 6

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8. a) Translate the following expression :

$a = b * - c + b * - c$

into

i) Quadruples

ii) Triples

iii) Indirect Triples.

b) What are the differences among Quadruples, Triples and Indirect Triples ?

c) Generate machine code for the following instruction : (3 + 3 + 3) + 3 + 3

$v = a + (b * c) - d$.

9. Consider the grammar :

$S \rightarrow aSbS \mid bSaS \mid \varepsilon$

a) Show that this grammar is ambiguous by constructing two different leftmost derivations for the sentence *abab*.

b) Construct the corresponding rightmost derivations and parse tree for the sentence *abab*.

c) What language does this grammar generate ? (3 + 3) + (4 + 3) + 2

10. Write short note of the following : 5 × 3

a) Thompson's Rule

b) Symbol Table Managment

c) Error Recovery Strategies in Syntax Analysis

d) LEX tool

e) Cross Compiler.

11. a) Explain FIRST and FOLLOW with example.

b) What is LL(1) grammar ?

c) Show that the following grammar :

S → AaAb | BbBa

A → ε

B → ε

is LL (1). (4 + 4) + 3 + 4

END

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