UNIVERSITY OF PUNE
[4364]-796
B. E. (INFORMATION TECHNOLOGY) Examination 2013
COMPILER DESIGN
(2008 Pattern)

[Total No. of Questions:12]   [Total No. of Printed pages :3]

[Time : 3 Hours]   [Max. Marks : 100]

Instructions :

(1) *Answer three questions from each section.*

(2) *Answers to the two Sections should be written in separate answer-books*

(3) *Neat diagrams must be drawn wherever necessary.*

(4) *Figures to right indicate full marks.*

(5) *Assume suitable data, if necessary.*

SECTION-1

Q1) a) Explain the Role of Lexical Analyzer, Explain interaction   [8]
between Lexical Analyzer and Parser, Define Lexeme, Token and
Pattern with suitable example.

b) Define passes and phases of Compiler. Explain different   [10]
phases of Compiler in detail.

OR

Q2) a) Explain the following terms   [6]

i)Cross Compiler

ii) Bootstrapping

iii) Incremental Compiler

b) Explain the role of Regular expression and DFA in Lexical Analyzer. [6]

c) Differentiate between Compiler and Interpreter.   [6]

Q3) a) Discuss the term 'Ambiguity of Grammar'. Consider   [10]
following grammar. $S \rightarrow S +S \mid S*S \mid a \mid b$
Determine whether the grammar is ambiguous? If yes, show resultant
parse trees for one example string.

b) Which are the conflicts may encounter during LR parsing? Explain   [6]
with example.

OR

Q4) a) Show that following grammar is LR (1) but not LALR.   [8]

S→ Aa │bAc│ Bc│ bBa

A→ d

B→ d

b) Explain the following terms with suitable examples.   [8]

i) Left Recursion   ii) Left Factoring

Q5) a) Explain the following terms with suitable examples.   [8]

i)S-attributed Grammar   ii)L-attributed Grammar

iii)Type Expression   iv)Abstract Syntax Tree

b) Suppose declarations are generated for Pascal Language by following   [8]
grammar:

D→ id L

L→,id L│ :T

T→int│real

Construct a translation scheme to enter the type of each identifier into the symbol table

OR

Q6) Consider the following attribyted grammar: [16]

Grammar Rule	Semantic Rule
S→XYZ	Y.s=S.s
	X.s=Y.i+Z.i
	S.i=X.i
X→x	X.i=3*X.s
Y→y	Y.i=Y.s
Z→z	Z.i=1

i)Draw Parse tree for string "xyz".

ii)Draw annotated parse tree.

iii)Draw dependency graph for associating attributes and describe correct order of evaluation.

iv)If S.s =4 before evaluation, what is S.i after evaluation?

SECTION –II

Q7)a)What is activation record? Explain its components with an example.   [10]

b)Explain procedure call with an example.   [6]

OR

Q8)a) Discuss Display Mechanism used by the Pascal compiler to handle[10] access to non-local names with adequate illustration.

b)Compare Static Scope and Dynamic Scope. Illustrate with suitable   [6] examples.

Q9)a) Generate quadruple, triple and indirect triple representation for   [6] following   a= -u*v / w^ x+y*z

b) Explain following code optimization techniques with example: [8]

        i) Common subexpression Elimination

        ii)Code Movement

        iii) Strength Reduction

        iv) Dead Code Elimination

c) Define the following terms with example   [4]

i) Live Variable   www.sppuonline.com

ii) Available expession

OR

Q10) a) For the following fragment of code, generate three address code,   [12] AST and DAG. do { p=p+x[i]/y[i];

        } while (i>100);

b) Explain the following terms with respect of simple code generation   [6] algorithm:

i)Register Descriptor

ii)Address Descriptor

Q11)a)Is there any difference between Class-based languages and   [6] object-based languages? If yes, justify the answer.

b) How can overloading and overriding of functions in object oriented   [10] programming languages handle by Compiler? Explain in detail.

OR

Q12) a) Explain different types of inheritance with example.   [8]

b) Discuss the features of OOP language and its benefits.   [8]