Total No. of Questions : 12] [Total No. of Pages :3

P1375

[3764] - 414

B.E. (Computer Engineering)

PRINCIPLES OF COMPILER DESIGN

(2003 Course)

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

Instructions to the candidates:

1) *Answers to the two sections should be written in separate books.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to the right indicate full marks.*
4) *Your answers will be valued as a whole.*
5) *Assume suitable data, if necessary.*

SECTION - I

Q1) a) Compare Compiler and Interpreter. **[4]**

b) Define following :
i) Cross compiler ii) Incremental Compiler **[4]**

c) Write a LEX program for a subset of C. **[8]**

OR

Q2) a) Explain various Compiler Construction tools. **[8]**

b) Write a LEX program to calculate number of words in the input C file. Program also should remove comments from the program. **[8]**

Q3) a) Construct LALR parsing table for following grammar. **[10]**

S -> AA
A -> aA
A -> b

b) Explain operator precedence parser. **[8]**

OR

Q4) a) Show that following grammar is LL(1) but not SLR(1). **[9]**

S -> AaAb | BbBa
A -> ϵ
B -> ϵ

b) Write a YACC program for a simple calculator. **[9]**

P.T.O.

Q5) a) Explain what is inherited and synthesized attributes. With example explain how these are calculated. [8]

b) Write Quadruple and Triple representation for following expression. [8]

A=B+C*D/E+-F*-G

OR

Q6) a) Write intermediate code generated for following sentences. [8]

While a < b do
If c < d then
x = y+z
Else
x = y-z

b) Explain with example concept of backpatching. [8]

SECTION - II

Q7) a) What is the need of Activation record? With example explain how these are generated. [8]

b) With example explain different parameter passing methods. [8]

OR

Q8) a) Enlist and explain in short different ways of accessing non-local names. [8]

b) What are different storage allocation strategies. Explain any one in detail. [8]

Q9) a) Explain peephole optimization in detail. [8]

b) Explain the dynamic programming code generation algorithm. [8]

OR

*Q10)*a) Explain various transformations that can be done on basic blocks. [8]

b) Write a note on code generator generators. [8]

*Q11)*a) With example explain different types of loops in flow graph. [8]

b) What is the need of code optimization? Discuss principal sources of code optimization. [10]

OR

*Q12)*a) For the following three address code statements [10]

i) PROD = 0

ii) I = 1

iii) T2 = ADDR(A) - 4

iv) T4 = ADDR(B) – 4

v) T1 = 4 * I

vi) T3 = T2[T1]

vii) T5 = T4[T1]

viii) T6 = T3 * T5

ix) PROD = PROD + T6

x) I = I + 1

xi) IF (I <= 20) GOTO (V)

Compute basic blocks and draw the flow graph.

b) Discuss algorithm for live variable analysis. [8]