SEAT No. :

P1785

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B.E. (Information Technology)
c-COMPILER DESIGN
(2008 Pattern) (Semester-I) (Elective-I)

Time : 3 Hours]   *[Max. Marks : 100*
Instructions to the candidates:
  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 the right indicate full marks.*
  5) *Assume suitable data, if necessary.*

SECTION-I

Q1) a) With the help of the block diagram and example explain different phases of the compiler. **[10]**

b) Write short note on Lex. **[6]**

OR

Q2) a) Write a LEX program to **[8]**

i) Display occurrences of word 'computer' in text.

ii) Read a text and display total number of vowels and total word in it.

b) Explain the role of lexical analyzer. Explain interaction between lexical analyzer and parser. Define lexeme, token and pattern with suitable example. **[8]**

Q3) For the following grammar

S → AaAb | BbBa

A → ε

B → ε

a) Compute First and Follow. **[6]**

b) Check whether grammar is LL(1). **[2]**

c) Construct Predictive parsing table. **[6]**

d) Show sequence of parsing steps for the string **[4]**

    i)   ab

    ii)   ba

<div align="center">OR</div>

Q4) Construct SLR parser for the grammar **[18]**

$D' \rightarrow D$

$D \rightarrow$ type tlist;

tlist $\rightarrow$ tlist, id | id

type $\rightarrow$ int | float

show the sequence of steps for the string float id, id;

Q5) a) What are SDD? Give SDD to translate expressions into syntax tree and draw syntax tree for a * b − 5 + c. **[8]**

b) Write three address sequences for the following:

    i)   switch (ch)

        {

            case 1: a = b + c;

                Break;

            case 2: a = b − c;

                Break;

        } **[4]**

    ii)   while x > y do

           if c < d then

             a = b * c

           else

             a = b / c **[4]**

<div align="center">OR</div>

Q6) a) Write SDD for Do-while statement and explain with example. **[8]**

b) Differentiate between L-attributed definitions and S-attributed definitions. **[8]**

SECTION-II

Q7) a) Write short note on activation records with its components. **[8]**

b) Explain static and dynamic scope. Illustrate with examples. **[8]**

OR

Q8) a) Explain following parameter passing methods with suitable example. **[8]**

    i) Call by value.

    ii) Call by reference.

    iii) Call restore.

    iv) Call by name.

b) Explain following terms with suitable example. **[8]**

    i) Control link.

    ii) Access link.

Q9) a) Explain sethi-Ullman algorithm for code generation with example. **[10]**

b) Write Quadruple and Triple representation of following expression

$$x := y / -z - y / -z - y * z$$ **[8]**

OR

*Q10)*a) With proper examples explain following optimizations: **[10]**

    i) Constant propagation.

    ii) Variable propagation.

    iii) Strength reduction.

    iv) Dead code elimination.

    v) Common subexpression.

b) Discuss the various principle sources of Code optimization. **[8]**

*Q11)*a)	Explain different features of object oriented programming with example.
	[8]

b)	Explain different types of polymorphism with examples.	**[8]**

OR

*Q12)*a)	Explain differences between class based language and object based language with example.	**[8]**

b)	Explain different types of inheritance with example.	**[8]**

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