Total No. of Questions :12]

SEAT No. :

P3412

[Total No. of Pages :4

[4959]-186

B.E. (Information Technology)

c: COMPILER DESIGN

(2008 Course) (Semester - I) (Elective - I) (414443)

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 right indicate full marks.***
5) ***Assume suitable data, if necessary.***

SECTION-I

Q1) a) With the help of the block diagram explain phases of the compiler. Also write down output of each phase of the compiler for expression P = Q + R /2 where p and Q are of float type and R is of integer type. **[10]**

b) How lexical analyses detect the errors? Explain with suitable example.**[6]**

OR

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

i) Write a LEX program which find out factors of a given number.

ii) Write a LEX program to find the area of circle.

b) Discuss the merits and demerits of a compiler and an interpreter. **[8]**

Q3) a) For following grammar

$S \rightarrow AaBb$

$A \rightarrow \varepsilon$

$B \rightarrow \varepsilon$

P.T.O.

i) Compute first and follow sets. **[6]**

ii) Construct LL(1) parser. **[4]**

iii) Parse string "ab" with above parser. **[2]**

b) Differentiate between top down and bottom up parser. **[6]**

OR

Q4) Show that following grammer is LR(1) but not LALR. **[18]**

$S \rightarrow Aa \mid bAc \mid Bc \mid bBa$

$A \rightarrow d$

$B \rightarrow d$

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

b) What is Backpatching? How flow translation of Boolean expression is done using batchpatching? **[8]**

OR

Q6) a) Write a grammar for simple procedure call. Give a syntax directed translation scheme for the same. **[8]**

b) Translate following assignment statement into intermediate code **[8]**

A [i] [j] : = (B [i] [j] + C [i] [j])* 10

SECTION-II

Q7) 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) What are symbol tables? Explain in brief the different ways to organize symbol table. **[8]**

OR

Q8) a) Explain different source language issues. **[8]**

b) Explain following storage allocation schemes with proper examples. **[8]**

i) Stack storage allocation

ii) Heap storage allocation

Q9) a) With proper examples explain following peephole optimization techniques: **[8]**

i) Elimination of Redundant Instruction.

ii) Elimination of Unreachable Code.

iii) Flow of Control Optimization.

iv) Algebraic Simplification.

b) Discuss different issues in code generation phase. **[10]**

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) What is DAG? Write different applications of DAG. **[8]**

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

b) How can overloading and overriding of functions in object oriented programming languages handle by Compiler? Explain in detail. **[8]**

OR

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

b) Explain exception handling in object oriented programming with example. **[8]**

EEE