Total No. of Questions : 10]

SEAT No. :

P3986

[Total No. of Pages : 2

[5561]-691
B.E. (Computer Engineering)
COMPILERS
(2015 Pattern) (Elective - III) (Semester - II)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) Write Lex Specification to count lines, spaces, tabs and words from given input. **[6]**

b) Explain Error recovery strategies in Parser. **[4]**

OR

Q2) a) Compute FIRST and FOLLOW for the following grammar **[6]**

$E \rightarrow E + T \mid T$

$T \rightarrow T * F \mid F$

$F \rightarrow (E) \mid id$

b) Write Syntax Directed Definition for constructing syntax tree for arithmetic expressions. **[4]**

Q3) a) Test whether following grammar is LL (1) **[6]**

$S \rightarrow i\ E\ t\ S\ S' \mid a$

$S' \rightarrow eS \mid empty,$

$E \rightarrow b$

b) What is Three Address Code? Generate three address code for

$a = b * -c + d$ **[4]**

OR

Q4) a) Explain the need of symbol table in Compiler. List and explain any two operations carried on Symbol table. **[6]**

b) Explain following terms with suitable examples S-attributed Grammar, L-attributed Grammar. **[4]**

P.T.O.

Q5) a) What is activation record? List and explain its fields. **[6]**

b) Explain any two Storage allocation strategies. **[6]**

c) Explain following terms
Call by Value and Call by reference **[4]**

OR

Q6) a) Explain Display Mechanism. How Display is used to access non-local data. **[6]**

b) What are the Source Language issues? Explain any two. **[6]**

c) Compare Static Scope and Dynamic Scope. **[4]**

Q7) a) List the issues in Code Generation. Explain any two of them. **[6]**

b) Explain the decisions of Code Generator function/procedure for the statement x = y op z **[6]**

c) Construct the DAG for following assignment statement
a + b * c + b * c + d **[4]**

OR

Q8) a) What is Basic Blocks? Explain the algorithm used to partition three address code into Basic Block. **[6]**

b) Explain the term Register Descriptor and Address Descriptor along with suitable example. **[6]**

c) Explain labelling algorithm used in Code Generator. **[4]**

Q9) a) Explain following optimization techniques along with suitable example. **[6]**
Common Sub-expression Elimination,
Dead Code Elimination

b) Write Data Flow Equations for **[6]**
If E then S1 else S2
Do S while E

c) Explain Following Loop Optimization Techniques **[6]**
Code Motion
Strength Reduction

OR

Q10)a) Why Code Optimization is required? Differentiate Local and Global Optimization. **[6]**

b) Draw a Sample Flow Graph and Explain Generation and Killing of expression with respect to it. **[6]**

c) List and Explain loops in Flow Graph. **[6]**