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# C.U.SHAH UNIVERSITY Summer Examination-2019 

## Subject Name : Translator Design

Subject Code : 4TE07TDE1 Branch: B.Tech (CE)
Semester : 7 Date : 18/03/2019
Time : 10:30 To 01:30
Marks : 70

Instructions:
(1) Use of Programmable calculator \& any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 Attempt the following questions:
a) Define compiler.
b) What is annotated parse tree?
c) Define handle.
d) What is activation record?
e) Give definition of cross compiler.
f) Differentiate between inherited attribute and synthesized attribute.
g) What do you mean by two pass assembly?
h) What is LEX and YACC?
i) What is DAG? Draw a DAG for $\mathrm{a}+(\mathrm{b}-\mathrm{c})^{*} \mathrm{~d}+(\mathrm{b}-\mathrm{c})^{*} \mathrm{~d}$
j) Define operator grammar.
k) Give regular definition for a language of 0's and 1's where all string should consist of even number of 0 's and odd number of 1 's.
l) What is ambiguous grammar?
m) What is peephole optimization?
n) List various storage allocation strategies.

## Attempt any four questions from Q-2 to Q-8

## Q-2 Attempt all questions

(a) Explain phases of compiler in detail.
(b) Construct NFA using Thompson's notation and construct DFA from it for following expression: $\mathrm{a}^{+}(\mathrm{b} \mid \mathrm{c}) \mathrm{a}^{*} \mathrm{c} \#$

## Q-3 Attempt all questions

(a) Construct DFA for following regular expression without constructing NFA and minimize it $a^{*} b^{*} a(a \mid b) * b^{*} a \#$
(b) Find LR(1) items for following grammar and construct CLR parsing table.
$\mathrm{S} \rightarrow \mathrm{Aa|aAc|Bc\mid bBa}$
$\mathrm{A} \rightarrow \mathrm{d}$
$B \rightarrow d$

## Q-4 Attempt all questions

(a) What is symbol table? Explain various techniques to implement symbol table.
(b) Write three address codes for following expression and generate final code by clearly showing register descriptors and address descriptors. $x=a *(b-c)-d /(e+-f)$.

Q-5 Attempt all questions
(a) Construct a predictive parser for the grammar
$\mathrm{E} \rightarrow \mathrm{E}+\mathrm{T} \mid \mathrm{T}$
$\mathrm{T} \rightarrow \mathrm{T}^{*} \mathrm{~F} \mid \mathrm{F}$
$\mathrm{F} \rightarrow \mathrm{F}^{\prime}|(\mathrm{E})| 0 \mid 1$
(b) Construct a syntax directed translation schema that translates arithmetic expressions from infix into postfix notation. Show the application of your scheme to string " $3 * 4+5 * 2$ "

Q-6 Attempt all questions
(a) Find $\operatorname{LR}(0)$ items for following grammar and construct SLR parsing table.
$\mathrm{S} \rightarrow \mathrm{AaAb}$
$\mathrm{S} \rightarrow \mathrm{B}$ b B a
$\mathrm{A} \rightarrow \in$
$B \rightarrow \in$
(b) For following grammar find operator precedence function values.
$E \rightarrow E+E\left|E^{*} E\right| E^{\wedge} E|(E)|$ id

## Q-7 Attempt all questions

(a) List the major steps of relocation and linking algorithms. Explain in brief.
(b) Explain principle sources of code optimization in detail.

Q-8 Attempt all questions
(a) What is nested macro? Explain with suitable example.
(b) Explain various parameter passing methods in detail.

