TCS-602 313

Even Semester Examination, 2017-18

B.TECH. (SEMESTER-VI)

COMPILER DESIGN

Time: 03:00 Hours **Max Marks : 100**

Note : Attempt **all** questions.

Q1. Attempt **any four** Questions: (4 × 5 = 20)

(a) What are the various phases of the compiler Explain each phase in detail.

(b) Write down the various BNF notations and Explain the significance of each in detail.

(c) What is LEX and YACC. What is the format of LEX input file.

(d) What is the role of lexical analyzer. Expain the process of constructing the NFA from regular expression.

(e) Why are multiple passes required in a compiler. Describe strategies for reducing the number of passes.

(f) Describe Boot strapping and its uses in compiler design.

Q2. Attempt **any four** questions: (4 × 5 = 20)

(a) Check whether the following grammer is LL(1) grammer

$S \rightarrow iEtS \mid iEtSeS \mid a$

$E \rightarrow b$

(b) What do you understand by ambiguity in grammar? How the grammar is made unambiguous using precedence order and associativity among arithmetic operators.

(c) Compute first and Follow and construct the predictive parsing Talble for the following grammer

$E \rightarrow E + T \mid T$

$T \rightarrow T * F \mid F$

$F \rightarrow (E) \mid id$

(d) Write the quadruple, Triple and indirect triples for the following equation:

$(X+Y) * (Y+Z) + (X+Y+Z)$

(e) What language is generated by the following grammar?

$s \rightarrow 0s1 \mid 01$

(f) Construct minimum state DFA for the following regular expression

$(a|b)^*a(a|b)$

Q3. Attempt **any two** Questions: (2X 10 = 20)

(a) Consider the following grammar:

$S \rightarrow ABC$

$A \rightarrow a \mid bbD$

$B \rightarrow a \mid \epsilon$

$C \rightarrow b \mid \epsilon$

$D \rightarrow c \mid \epsilon$

Construct the first and follow sets for the grammar and also design a LL (1) parsing table for the grammar.

(b) Consider the grammar -

S ACB/ C b B/ B a

A da /BC

B g / €

C h / €

Calculate FIRST . FOLLOW and Construct the predictive Parsing Table.

(c) Construct the LALR parsing table for the following grammer

$S \rightarrow AA$

$A \rightarrow aA$

$A \rightarrow b$

(i) Generate the canonical sets of LR (1) items.

(ii) Construct the LALR parsing table.

Q4. Attempt **any two** Questions: (2 × 10= 20)

(a) Explain the logical Phase Error and Syntatic phase error. Also suggest methods for recovery of errors.

(b) What is Symbol Table? Explain its capabilities. also Mention the name suitable data structure for symbol table and explain it in detail.

(c) Consider the following grammar and give the syntax directed definitions to construct parse tree. For the input expression 4*7+1*2 construct an annotated parse tree according to your syntax directed definition:

E -> E*T|T

T -> T*F|F

F ->digit

Q. 5. Attempt **any two** Questions: (2×10 = 20)

(a) Describe the various storage management techniques in detail. Also describe DAG and explain how it is useful in the code optimization.

(b) Give the syntax directed translation scheme to translate the while control construct. Also translate the following program segment into three address code:

While(a>b)

If(c>d)

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c=c-d*e;
else
c=c+d*e;
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(c) Write short notes on the following:

(i) Local and loop optimization

(ii) Induction variable elimination

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