Veermata Jijabai Technological Institute

ESE B. Tech Third Year (Semester V)

181080004 **05/12/2020**

This is the subjective part of your examination. Write the answers on a paper, then scan and upload it in the appropriate classroom. All questions are compulsory.

R4IT3005S - Compiler Design

Section 1: 10 marks per question 10

1. Write Lex and Yacc code to check syntax of while loop in C language

Section 2: 5 marks per question 10

1. Consider the following grammar for simple LISP expressions:
   List -> (Sequence)
   Sequence -> Sequence Cell
   Sequence -> €
   Cell ->List
   Cell -> Atom
   Atom -> a
   where a, (, and) are terminal symbols, all other symbols are nonterminal symbols, with List being the start symbol.
   a) Why is the grammar as given not LL(1)?
   b) Transform the grammar into a form that is LL(1). Do not introduce any new nonterminals
2. What will happen if the first step augmenting grammar is skipped in of LR(K) parsing ?

Section 3: 10 marks per question 10

1. Design Syntax directed translation scheme for type checking of operands in a new language as follows: Basic types allowed are char and int. # denotes addition operation, $ denotes multiplication operation. If both the operands are int the result is int . If one operand is int and other operand is char then change the type of int operand to char. Also if both operand are char and the type of result is int , then change change the type of result to char Draw the annoted parse tree for given code in the new language build int g;
   char h,i;
   c = h # g;

Section 4: 5 marks per question 5

1. Find the reaching definition's for the following:

```
i = m-1;
j = n;
a = U1;
do
{ i = i + 1
j = j-1 ;
if e1 then
a = U2;
else
i = U3;
}while(e2)
```

Section 5: 5 marks per question 5

1. Perform the code optimization for the following code:

```
for( i = 1 ; I <= n ; i++ )
{
x = x+2;
for( j = 1 ; j <= n ; j++)
{
A[i][j]= 1000 * n + 10 * I + j + x;
x = x+1;
}
}
```

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