Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

II SEMESTER M.TECH. (COMPUTER SCIENCE & ENGG)

MAKEUP EXAMINATIONS, JUNE 2019

SUBJECT: COMPILERS AND ADVANCED OPERATING SYSTEMS

[CSE 5201]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

1A. What is the role of an assembler in Language Processing system? Explain the two parts of a compiler that maps a source program into semantically equivalent target program. 3

1B. Explain left recursion and left factoring with an example. Write the algorithm to eliminate left recursion. 3

1C. Check if the given **Grammar A** is LL(1) by constructing the predictive parse table? Show all the necessary steps. 4

bexpr → bexpr or bterm | bterm
bterm → bterm and bfactor | bfactor
bfactor → not bfactor | (bexpr) | true | false

Grammar A

2A. Explain with an example how pattern matching is done based on NFA's. 2

2B. Explain the concept of recursive decent parsing with the help of an algorithm. 3

2C. Construct an LR (1) Automaton for the given **Grammar B**. Construct the parse table and show the parsing actions for the input string "edeed". 5

S→ CC
C → eC | d

Grammar B

3A. For the given **Grammar C**, draw the annotated parse tree for evaluating an expression "1*2*3*4*(5+5)n.". Obtain the semantic rules. 4

L → En
E→TE'
E'→+TE'| ε
T → FT'
T' → *FT' | ε
F →(E) | digit

Grammar C

3B. Draw a DAG for the following expression: 3

(a+(a*a+b-c)/(a/b-b+c))-(b+(a*b+b-c)*(a/b+b-c))

Also for the following C-code segment, write the three address code using position numbers and show quadruple representation.

```
for i from 1 to 10 do
    for j from 1 to 10 do
            a[i,j] = 0.0;
    for i from 1 to 10 do
            a[i,i] = 1.0;
```

3C How will you partition three address instruction into basic blocks? For question 3B, construct the flow graph and identify the loops in your flow graph. Assume integers require 4 bytes. 3

4A What is meant by remote object reference? With a neat diagram, explain its representation. 5

4B Explain the request-reply protocol used for client-server communication. 5

5A With a diagram, explain the Centralized Algorithm for Mutual Exclusion. 5

5B With a neat example, Java object serialization. 5