MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

V SEMESTER B.TECH. (COMPUTER SCIENCE AND ENGINEERING)

END SEMESTER EXAMINATIONS, DEC 2021/JAN 2022

SUBJECT: COMPILER DESIGN [CSE 3151]

REVISED CREDIT SYSTEM
(21/12/2021)

Time: 2.20 PM – 3.35 PM   MAX. MARKS: 20

Instructions to Candidates:

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

1A. Given a, b, c, d as integer variables, show the output of different phases of compiler for the input: "R = ((a + b – c) * d) / 4.0". **3M**

1B. Write three address code and quadruple for the expression **3M**
$$a[i] = -b * (a[k--] – y[\ k--]\ /2)$$

1C. Consider the grammar **4M**
$$E \rightarrow TE'$$
$$E' \rightarrow\ + TE'\ |\ \varepsilon$$
$$T \rightarrow FT'$$
$$T' \rightarrow *FT'\ |\ \varepsilon$$
$$F \rightarrow (\ E\ )\ |\ digit$$
For the given expression (9 + 8 * 5) * 4, draw the annotated parse tree showing all the dependency edges. In addition, derive the semantic rules for the grammar.

2A. For the given grammar, construct LR (1) automaton. Also, list the states that have reduce entries. **3M**
A→XYZ | gY | d
X→XbZ | ε
Y→ pY | ε
Z→ a | ε

2B. For the following grammar, find the FIRST and FOLLOW set for each non-terminal and construct a predictive parse table. Also, show the parsing actions for the input string "ab*$". **4M**
M→NM'
M'→+M | ε
N→QN'
N'→QN'| N | ε
Q→ RQ'
Q'→*Q' | ε
R→ (M) | a | b | t

2C. How is phrase level recovery different from panic mode recovery? Illustrate with the help of an example. **3M**

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