[Nov-23]

GITAM (Deemed to be University)

[CSEN3061]

GST/GSS/GSB/GSHS Degree Examination

V SEMESTER

AUTOMATA THEORY AND COMPILER DESIGN

(Effective for the admitted batch 2021-22)

Time: 2 Hours **Max. Marks: 30**

Instructions: All parts of the unit must be answered in one place only.

Section-A

1. Answer all Questions: **(5×1=5)**

a) Define language and discuss its operations.
b) Discus Greibach Normal Form with suitable example.
c) Discuss the use of semantic analysis during compilation phase.
d) What does YACC stand for, and what is its primary use in parsing?
e) What is three address code in intermediate code generation?

Section-B

Answer the following: **(5×5=25)**

UNIT-I

2. Illustrate construction of DFA to accept binary string whose decimal equivalent is divisible by 5 and $\sum = \{0, 1\}^*$.

OR

3. Convert the following regular expressions to NFA with epsilon transitions: (i) 0*+1101. (ii) (0+1)*

UNIT-II

4. Explain the following with suitable examples:
(a) Ambiguity in CFGs.
(b) Left recursion in CFGs

OR

5. Construct a PDA that accepts the language L = {WCW^R/W ∈ (a+b)*}.

UNIT-III

6. Elaborate the role of the Lexical Analyzer in the compiler's front-end, and, also explain its primary responsibilities.

OR

7. Justify the applications of cross compiler and bootstrapping in compiler design.

UNIT-IV

8. Construct the SLR parsing table for the following grammar:
   E -> E + T | T
   T -> TF | F
   F -> F* |a | b

OR

9. In order to parse a given input string by shift reduce parser, explain the conflicts that arise during parsing, with suitable example.

UNIT-V

10. Explain peephole optimization and its application in code generation with suitable example.

OR

11. What is copy propagation? Explain its usability in code optimization with suitable example.