Code No: 155FG **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, August/September - 2024
FINITE AUTOMATA AND COMPILER DESIGN
(Common to CSE(IOT), CSE(N))

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	Define Token and Lexeme.	[2]
b)	What is Context free grammar? Provide examples.	[3]
c)	What are the actions performed by Shift reduce parser?	[2]
d)	Compare LL parsers and LR parsers.	[3]
e)	What is type expression?	[2]
f)	Define Type Equivalence and state its need.	[3]
g)	Define Basic Block.	[2]
h)	How can you identify the leader in a Basic block?	[3]
i)	Which graph is used for identifying the common sub expression in an expression	[2]
j)	Define code generation.	[3]

PART - B

(50 Marks)

2.a) Construct Finite Automata for the regular Expression 1(01+10)*00.
b) Show that $L=\{a^{2n}/n<0\}$ is Regular. [5+5]

OR

3.a) Define Derivation tree. Explain about LMD and RMD.
b) Explain in detail about LEX Tool. [5+5]

4.a) Construct a LR(1) items for the Grammar E→E+E/E*E/id and construct LR parser table for the grammar.
b) Construct a annotated parse tree for the expression 3*5+4/n. [5+5]

OR

5.a) Construct SLR Parsing table for the grammar E→E+T/T, T→T*F/F,F→(E)/id.
b) Construct a Quadruple, Triple and Indirect Triple for the statement a=b+c*d? [5+5]

6. Explain in detail about Type checking and Type Conversion. [10]

OR

7.a) Explain about the following:
(i) Inherited attribute (ii) Synthesized attribute
b) Explain in brief about Overloading of functions with examples. [5+5]

8.a) Differentiate between Static and Dynamic Storage allocation Strategies.
b) Explain in brief about Heap Storage allocation strategy. [5+5]

OR

9.a) Define Symbol table. Explain about the data structures used for Symbol table.
b) Explain in detail about Peephole Optimization. [5+5]

10.a) Explain in detail the procedure that eliminates global common sub expression.
b) What is an Induction variable? Illustrate with an example. [5+5]

OR

11.a) What are the object code forms? Explain the issues in code generation.
b) Explain in brief about frequency reduction. [5+5]

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