

Code No: **R20A0512****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, June/July 2024**Compiler Design
(CSE & CSE-AIML)**

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Time: 3 hours**Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 Recognise the functions of a Lexical Analyzer. State the reasons for the Separation of Analyses programs into Lexical, Syntax, and Semantic Analyses. [14M]

OR

- 2 A Classify the parser into various types. [7M]
B How do you organize NFA from Regular expression? [7M]

SECTION-II

- 3 A Discover the rule to eliminate left recursion in a grammar. Prepare and eliminate the left recursion for the grammar. [7M]

$$S \rightarrow Aa \mid b$$

$$A \rightarrow Ac \mid Sd \mid \epsilon$$

- B Identify the advantages and disadvantages of LR Parser. [7M]

OR

- 4 A Construct the predictive parsing table for the following grammar and verify the string (a, a) is accepting or not. [9M]

$$S \rightarrow (L) \mid a$$

$$L \rightarrow L, S \mid S$$

- B Check whether the following grammar is a LL(1) grammar [5M]

$$S \rightarrow iEtS \mid iEtSeS \mid a$$

$$E \rightarrow b$$

Also define the FIRST and FOLLOW procedures.

SECTION-III

- 5 A Write syntax directed definition for simple desk calculator. Using this definition draw annotated parse tree for $3*5+4n$. [7M]

- B Explain the unification algorithm by us type checking concepts [7M]

OR

- 6 A Explain the use of symbol table in compilation process. List out the various attributes for implementing the symbol table [7M]

- B Generate code for the following: i) $x=f(a)+f(a)+f(a)$ ii) $x=f(f(a))$ [7M]

SECTION-IV

- 7 Discuss about the followings: [14M]
i) Copy propagation
ii) Dead code Elimination
iii) Code motion.

OR

- 8 A Consider the following loop, generate three address code and draw the flow graph [7M]

```
Begin
  Prod=0
  i=1
  do
    Begin
      Prod=Prod+a[i]*b[i]
      i=i+1
    End
  While (i≤20)
End
```

- B Relate the static and dynamic storage allocation for any program segment [7M]

SECTION-V

- 9 A Explain in detail about global common sub expression elimination technique. [7M]

- B Define dataflow analysis? List out the procedures to analyse the data flow of structured programs? [7M]

OR

- 10 Write the next-use information for each line of the following 3 address code basic block. [14M]

```
a:=b+c x:=a+b b:=a-d c:=b+c d=a-d y=a-d
***
```