Code No.: CS601PC | R20 | H.T.No. | | | 8 | R | | | | | |

# CMR ENGINEERING COLLEGE: : HYDERABAD
## UGC AUTONOMOUS
## III–B.TECH–II–Semester End Examinations (Regular) - June- 2024
## COMPILER DESIGN
## (Common for CSE, IT, CSC, CSD)

**[Time: 3 Hours]** **[Max. Marks: 70]**

**Note:** This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

**PART-A** **(20 Marks)**

| | | |
|---|---|---|
| 1. a) | Write down any two properties of compiler. | [2M] |
| b) | What do you understand by the term input buffering in Lexical analysis. | [2M] |
| c) | Write Rules to construct Follow Function. | [2M] |
| d) | Explain why SLR and LALR are more economical to construct Canonical LR? | [2M] |
| e) | What is syntax directed translation (SDD)? | [2M] |
| f) | Write short note on: a. Synthesized attributes. | [2M] |
| g) | Explain the role of code generator in a compiler? | [2M] |
| h) | Summarize the issues in the design of code generator. | [2M] |
| i) | List the advantages of the organization of code optimizer? | [2M] |
| j) | Define the 3 areas of code optimization? | [2M] |

**PART-B** **(50 Marks)**

2. What is Regular Expression? [10M]
Write the regular expression for:
   i. Union operation
   ii. concatenation Operation
   iii. Kleen Closure
   iv. Positive Closure
   v. Write a regular expression for a language containing strings which end with "abb" over $\Sigma$= {a,b}.
   vi. Construct a regular expression for the language containing all strings having any number of a's and b's except the null string.

**OR**

3. Explain the role Lexical Analyzer and Syntax analyzer and mention the issues of Lexical Analyzer. [10M]

4.a) What are the problems associated with Top Down Parsing? [5M]
b) Write the production rules to eliminate the left recursion and left factoring problems. [5M]

**OR**

5. Show the following Grammar: S-> AaAb|BbBa A-> $\epsilon$ B-> $\epsilon$ Is LL(1) and parse the input string "ba". [10M]

6. Write an S-attributed grammar to connect the following with prefix rotator. L→E [10M]
E→ E+T|E-T|T
T→ T*F|T/F|F
F→ P↑F|P
P→ (E)
P→ id

**OR**

7.a) Construct triples of an expression: a *- (b + c). [10M]
b) Explain why are quadruples preferred over triples in an optimizing compiler?

8. Discuss various object code forms? Write a short note on code generating algorithms? [10M]

**OR**

9. What are basic blocks? Write the algorithm for partitioning into Blocks. [10M]

10. Explain various Global optimization techniques in detail. [10M]

**OR**

11. Discuss about the following [10M]
    i. Copy propagation
    ii. ii. Dead code elimination iii. Code motion.

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