R20

Code No: R20A0512

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, June 2025

Compiler Design

(CSE & CSE-AIML)

Roll No										

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.

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			BCLL	CO(s)	Marks
		SECTION-I			
1	***A***	Discuss the various phases of compilation.	**L2**	**CO-I**	**[7M]**
	B	Define bootstrapping. Explain its significance and how it allows for the development of more advanced compilers.	**L2**	**CO-I**	**[7M]**
		OR			
2	***A***	Analyze the various data structures utilized in compiler design.	**L4**	**CO-I**	**[7M]**
	B	Explain the structure of LEX program.	**L2**	**CO-I**	**[7M]**
		SECTION-II			
3	***A***	Find the FIRST and FOLLOW for the non-terminals of the following grammar after eliminating the left recursion. E → E + T | T T → T * F | F F → (E) | id	**L3**	**CO-II**	**[7M]**
	B	What is the significance of error recovery in bottom-up parsing? Discuss strategies employed to manage syntax errors during the parsing process.	**L2**	**CO-II**	**[7M]**
		OR			
4	***A***	Explain the structure of the LR parsing table.	**L2**	**CO-II**	**[7M]**
	B	Construct the LR(1) sets of items for the following grammar. S' → S S → C C C → c C | d	**L5**	**CO-II**	**[7M]**
		SECTION-III			
5	***A***	Explain about type checking and Type conversion.	**L2**	**CO-III**	**[7M]**
	B	Draw the annotated parse tree for 2*3 +4 by considering only synthesized attributes.	**L3**	**CO-III**	**[7M]**
		OR			
6	***A***	Describe the different forms of intermediate code.	**L2**	**CO-III**	**[7M]**
	B	Define a symbol table and discuss its role in the compilation process. What kind of information does a symbol table typically contain?	**L2**	**CO-III**	**[7M]**
		SECTION-IV			
7	***A***	Explain about activation records. How do these structures	**L2**	**CO-IV**	**[7M]**

		facilitate function calls and returns in a program?			
	B	Discuss about stack allocation strategy with an example.	**L2**	**CO-IV**	**[7M]**
		OR			
8	***A***	Construct the flow graph after code motion and after eliminating induction variable for the below program segment.	**L5**	**CO-IV**	**[7M]**

```
begin
   PROD := 0;
   I := 1;
   do
      begin
         PROD := PROD + A[I] * B[I];
               I := I + 1;
      end
    while I <=20
end
```

	B	Explain about copy/variable propagation and Elimination of dead code.	**L2**	**CO-IV**	**[7M]**
		SECTION-V			
9	***A***	Discuss about Data flow analysis for structured programs.	**L2**	**CO-V**	**[7M]**
	B	Explain about Live variable analysis.	**L2**	**CO-V**	**[7M]**
		OR			
10	***A***	Describe the issues in the design of code generator.	**L2**	**CO-V**	**[7M]**
	B	Explain about machine dependent code optimization.	**L2**	**CO-V**	**[7M]**

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