

Code: 20CS3601

**III B.Tech - II Semester – Regular / Supplementary Examinations
APRIL 2024**

**COMPILER DESIGN
(COMPUTER SCIENCE & ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.

2. All parts of Question must be answered in one place.

BL – Blooms Level

CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	a)	Differentiate tokens, patterns, lexeme.	L2	CO1	7 M
	b)	Write a short note on: i. Assembler ii. Linkers and loaders	L2	CO1	7 M
OR					
2	a)	What are the various phases of a compiler? Explain each phase in detail by using the input “ $x=(y+z)*2$ ”.	L2	CO1	10 M
	b)	What are the various parts in <i>LEX</i> program?	L2	CO1	4 M
UNIT-II					
3	a)	Write the production rules to eliminate the left recursion and left factoring problems.	L2	CO1	4 M

	b)	<p>Consider the grammar.</p> $S \rightarrow AB ABad$ $A \rightarrow d$ $E \rightarrow b$ $D \rightarrow b \epsilon$ $B \rightarrow c$ <p>Construct the predictive parsing table. Show that the given grammar is <i>LL(1)</i> or <i>not</i>.</p>	L3	CO2	10 M
OR					
4	a)	Write Rules to construct <i>FIRST</i> function and <i>FOLLOW</i> function.	L2	CO1	4 M
	b)	<p>Show the following Grammar</p> $S \rightarrow AaAb BbBa$ $A \rightarrow \epsilon$ $B \rightarrow \epsilon$ <p>Is <i>LL(1)</i> and parse the input string “<i>ba</i>”.</p>	L3	CO2	10 M
UNIT-III					
5	a)	What is a shift-reduce parser? Explain in detail the conflicts that may occur during shift-reduce parsing.	L2	CO1	4 M
	b)	<p>Write the rules to construct the SLR parsing table.</p> $E \rightarrow E+T T$ $T \rightarrow TF F$ $F \rightarrow F* a b$ <p>Construct the SLR parsing table and also parse the input “<i>a*b+a</i>”.</p>	L2	CO3	10 M

OR					
6	a)	Write the rules to construct the SLR parsing table.	L2	CO1	7 M
	b)	List all <i>LR(0)</i> items for the following grammar: $S \rightarrow AS \mid b$ $A \rightarrow SA \mid a$	L3	CO3	7 M
UNIT-IV					
7	a)	What is LALR parser? Construct the set of LR(1) items for this grammar: $S \rightarrow CC$ $C \rightarrow aC$ $C \rightarrow d$	L3	CO3	7 M
	b)	What is intermediate code and write the two benefits of intermediate code generation.	L2	CO4	7 M
OR					
8	a)	Draw the syntax tree and DAG (Direct Acyclic Graph) for the following expression: $(a*b)+(c-d)*(a*b)+b$	L3	CO4	7 M
	b)	i. What are the limitations of static allocation? ii. List Dynamic Storage allocation techniques.	L4	CO5	7 M

UNIT-V

9	a)	What are basic blocks? What is the use of algebraic identities in optimization of basic blocks?	L2	CO4	7 M
	b)	What do you mean by machine dependent and machine independent optimization?	L3	CO1	7 M

OR

10	a)	Write a short note with example to optimize the code: i. Dead code elimination. ii. Code motion.	L3	CO1	7 M
	b)	Discuss the various peephole optimization techniques in detail.	L2	CO4	7 M