Code No: R2031421 **R20** SET - 1

III B. Tech I Semester Regular/Supplementary Examinations, December -2023
COMPILER DESIGN
CSE(AIML),CSE(AI),CSE(DS),CSE(AIDS),AIDS,AIML& CSD

Time: 3 hours Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
*****

UNIT-I

1		Illustrate the phases of a compiler indicating the inputs and outputs of each phase in translating the statement "amount = principle + rate * 36.0 ".	[14M]
		(OR)	
2	a)	Explain how Lexical analyzer is generated using LEX?	[7M]
	b)	Write short notes on input buffering	[7M]

UNIT-II

3	a)	Define parser and discuss the role of parser in compilation process.	[7M]
	b)	Explain the term ambiguous grammar with appropriate example.	[7M]
		(OR)	
4	a)	Compare bottom-up approaches of parsing with top-down approaches	[7M]
	b)	Discuss how Brute-Force approach operates in top down parsing?	[7M]

UNIT-III

5		Construct SLR parsing table for the flowing grammar E→E+T/T T→ T*F/F F →(E)/id .	[14M]
		(OR)	
6	a)	Write short notes on syntax Directed Definition.	[7M]
	b)	Discuss the evaluation of semantic rules in SDDs.	[7M]

UNIT-IV

7	a)	How symbol table can be managed? Explain.	[7M]
	b)	Discuss storage allocation for block structured languages	[7M]
		(OR)	
8	a)	Write the quadruple, triple, indirect triple for the expression (a*b) + (c+d)-(a+b+c+d).	[7M]
	b)	Write an algorithm for constructing the dependency graph for a given parse tree?	[7M]

UNIT-V

9		List and discuss the issues in the design of a code generator	[14M]
		(OR)	
10	a)	Explain with an example optimization of Basic blocks	[7M]
	b)	Describe with suitable example various sources of loop optimization	[7M]

Code No: R2031421 **R20** SET - 2

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*****

UNIT-I

1	a)	Discuss in detail about the role of Lexical analyzer in compiler construction	[7M]
	b)	Elaborate on the issues in Lexical analysis.	[7M]
		(OR)	
2	a)	Define Compiler. What is the importance of Compiler?	[7M]
	b)	Write short notes on Finite Automata and its applicability in compilers.	[7M]

UNIT-II

3	a)	Explain various types of bottom-up parsers with example. Write the steps to construct LR(0) parsing table.	[9M]
	b)	Compare left recursion with left factoring with suitable example.	[5M]
		(OR)	
4	a)	Explain the LR parsing algorithm with an example.	[7M]
	b)	Write short notes on Left Factoring. Give its significance in syntax analysis.	[7M]

UNIT-III

5		Find the SLR parsing table for the given grammar and parse the sentence $(a + b) * c$ $E \rightarrow E + E/E * E/ (E) /id$.	[14M]
		(OR)		
6	a)	How do you implement syntax directed definitions? Explain intermediate form of source program with example.	[10M]
	b)	Write Short notes on Three address code.	[4M]

UNIT-IV

7	a)	What are the various storage allocations in runtime environment? Explain them.	[7M]
	b)	Discuss the features of stack memory allocation.	[7M]
		(OR)	
8	a)	What is an activation record? Explain the role activation record in runtime storage allocation.	[7M]
	b)	What is a flow graph? Explain with an example.	[7M]

UNIT-V

9	a)	Explain about various levels and types of optimizations.	[7M]
	b)	Write short notes on peephole optimization.	[7M]
		(OR)	
10	a)	What is the role of code Optimizer in compiler? Is it a mandatory phase?	[7M]
	b)	Explain the role of DAG in optimization with example.	[7M]

Code No: R2031421 **R20** SET - 3

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Time: 3 hours Max. Marks: 70

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*****

UNIT-I

1	a)	What is lexical analysis? List out the functions of a Lexical Analyzer.	[7M]
	b)	State the reasons for the Separation of Analyses programs into Lexical, Syntax, and Semantic Analyses.	[7M]
		(OR)	
2	a)	Write short notes on bootstrapping.	[5M]
	b)	Define left recursion. Is the following grammar left recursive? E → E+E	E*E| a| b .	[9M]

UNIT-II

3	a)	What is syntax tree? Draw the annotated parse-tree for the input 3*5+4n.	[7M]
	b)	Write Short notes on Recursive Descent Parsing.	[7M]
		(OR)	
4		Define a Parser. What is the role of grammars in Parser construction? Construct the Predictive parsing table for the grammar G : E → E+T |T , E →T*F |F , F →(E) |id.	[14M]

UNIT-III

5	a)	Construct SLR parsing table for the following grammar: R-> R'|'R|RR|R*|(R)|a| b .	[7M]
	b)	Describe the types of LR parsers.	[7M]
		(OR)	
6	a)	Compare the operating mechanism of LR parser with LL parser.	[7M]
	b)	List and Explain the different types of type checking.	[7M]

UNIT-IV

7	a)	What is DAG? Explain their role in compilation process.	[7M]
	b)	Explain the different storage allocation strategies.	[7M]
		(OR)	
8	a)	What is code optimization? Give example for any two optimization techniques.	[9M]
	b)	What is a flow graph? Explain with an example.	[5M]

UNIT-V

9		Write the simple code generation algorithm and generate the code for the statement W:=(A-B) + (A-C) + (A-C) .	[14M]
		(OR)	
10	a)	Explain the three techniques for loop optimization with examples.	[7M]
	b)	Write Short notes on Register allocation in Code generation.	[7M]

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*****

UNIT-I

1		Discuss the phases of a compiler with suitable example.	[14M]
		(OR)	
2	a)	What is LEX? Discuss the usage of LEX in Lexical Analyzer generation.	[7M]
	b)	Write a note on the parse generator '_ YACC.	[7M]

UNIT-II

3	a)	What do you mean by left factoring the grammars? Explain.	[7M]
	b)	List down the conflicts during shift-reduce parsing.	[7M]
		(OR)	
4	a)	List and Explain Pre Processing steps of Top Down Parsing.	[7M]
	b)	Explain about Parse tree with suitable example.	[7M]

UNIT-III

5		What is an LR(0) item? Construct an SLR parsing table for the grammar G: S→ L=R |R, L → *R | id, R → L. Is it SLR(1) grammar?	[14M]
		(OR)	
6	a)	Explain bottom up parsing with an example.	[7M]
	b)	What is dangling ELSE ambiguity? How to handle it?	[7M]

UNIT-IV

7	a)	Define activation records. Explain how it is related with runtime storage allocation.	[7M]
	b)	What is Run time Environment? Explain in detail.	[7M]
		(OR)	
8	a)	Obtain the directed acyclic graph for the expression: x+x*(y+ z)+(y+z)* w .	[9M]
	b)	Write short notes on Basic block focusing on its optimization.	[5M]

UNIT-V

9	a)	List and Explain Various possible Outputs of Code Generator.	[7M]
	b)	Discuss Global Register Allocation in code generation.	[7M]
		(OR)	
10		Generate code for the following: i) x=f(a)+f(a)+f(a) ii) x=f(f(a)) iii) x=++f(a) iv) x=f(a)/g(b,c)	[14M]